



Visual Literacy in EAP: The Dialogue between Reader/Designer Features and Multimodal Text

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Research Problem

- What is multimodality?
- What is multimodal literacy?
- How can an EAP specialist be literate in multimodal discourse?
- What are the skills/subskills associated with multimodal literacy?



Literature review

- "social semiotics"
- Meaning construction is "a sign-making process" (Kress, 2003. p. 141).
- Meaning-making depends on multimodal resources.
- Multimodality is the combination of several semiotics resources as "carriers of meaning" (Bezemer & Kress, 2008. p. 166).
- Modes have different potentials/limitations of meaning construction (Kress, 2003).
- Descriptive/text-oriented/ideal reader and designer
- The present study is empirical.
- Mechanisms of multimodal literacy development

Assumptions

- Multimodal literacy exists.
- Multimodal literacy is context-dependent (domain of literacy): EOP/EAP (English for Academic Purposes).
- EAP: medical/ business/Biology
- Present study: EAP/ management
- Channel-dependent (oral/written)
- Genre-dependent: RA (research article)

Participants

- Eight Tunisian PhD students from the field of management
- Disparate levels of visual literacy
- Different background knowledge of the subject area and topic (RA)
- Reading design strategies (verbal/visual/ interactive)
- Questionnaire/observation



Methodology

- Empirical/Task-based
- RA from the field of marketing
 - * Reading-based tasks
- Visual matching
- CR matching
- *Design-based tasks
 - Production
 - Visual completion



Methods of data analysis

*Quantitative:

- The tasks were divided into the component difficulties (titles, subtitles, captions).

- Accurate answers were calculated.

*Qualitative:

- Each difficulty was associated with the skills needed to master it.

- Classification of skills relied on:

*Language-based theories

- Functional grammar (Halliday and Matthiessen,2004)

- Genre analysis (Swales, 1990)

*Social-semiotics

- The grammar of visual design (Kress and van Leeuwen, 1996; 2006)

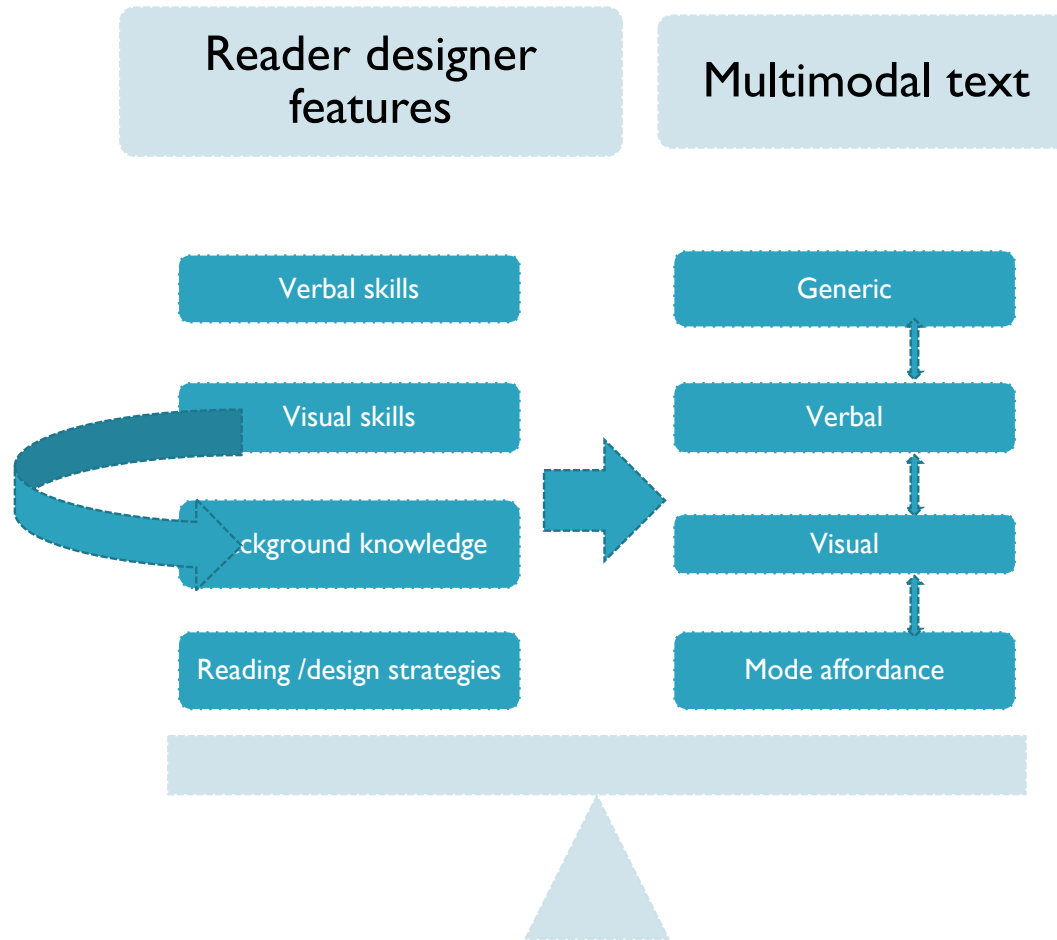
Results: The Nature of Reading and Design

- - Reading and design are meaning-building processes (Kress, 2003).
- The skills underlying reading and design (Hirvela; 2004; Kress, 2003) are quite similar.
- Multimodal literacy involves making meaning out of texts with multimodal resources.
- The skills underlying the reading and design of multimodal texts are verbal/ visual/interactive (the ability to find the link between the verbal and the visual).

Results: The Nature of Multimodal Literacy

- **Multimodal literacy is a dynamic/ interactive / Multi-levelled process.**
 - Dynamic:
 - Multimodal literacy is open to change through practice/ teaching.
 - Different variables can affect the development of multimodal literacy.
 - Multi-levelled:
 - Multimodal literacy relates to texts with multimodal resources: verbal/visual/ combination of both.
 - Skills are verbal/ visual and interactive.
 - No strict divide between them/ interdependent
 - Some skills are more important than others .
 - The importance of skills is tied to the difficulty.

Multimodal literacy is an interactive process; dialogue between reader/Designer Features and Multi-modal text



Knowledge of the Generic Features of the Multimodal Text

- *The RA is a highly conventionalized genre.

- *Multimodal literacy involves knowledge of RA generic features.

- Ability to distinguish CRs and visuals belonging to academic RAs.

- Ability to identify the features of visuals and CRs across the rhetorical sections.

- The overlap between text and visual across the rhetorical sections.

- The ability to identify particular « moves » in CRs

Visuals and CRs across Rhetorical Sections: Theoretical versus Results

TABLE 1

DECISION RULES FOR DETERMINING WHETHER A CONSTRUCT IS FORMATIVE OR REFLECTIVE

	Formative model	Reflective model
1. Direction of causality from construct to measure implied by the conceptual definition Are the indicators (items) (a) defining characteristics or (b) manifestations of the construct? Would changes in the indicators/items cause changes in the construct or not? Would changes in the construct cause changes in the indicators?	Direction of causality is from items to construct Indicators are defining characteristics of the construct Changes in the indicators should cause changes in the construct Changes in the construct do not cause changes in the indicators	Direction of causality is from construct to items Indicators are manifestations of the construct Changes in the indicator should not cause changes in the construct Changes in the construct do cause changes in the indicators
2. Interchangeability of the indicators/items Should the indicators have the same or similar content? Do the indicators share a common theme? Would dropping one of the indicators alter the conceptual domain of the construct?	Indicators need not be interchangeable Indicators need not have the same or similar content Indicators need not share a common theme Dropping an indicator may alter the conceptual domain of the construct	Indicators should be interchangeable Indicators should have the same or similar content Indicators should share a common theme Dropping an indicator should not alter the conceptual domain of the construct
3. Covariation among the indicators Should a change in one of the indicators be associated with changes in the other indicators?	Not necessary for indicators to covary with each other Not necessarily	Indicators are expected to covary with each other Yes
4. Nomological net of the construct indicators Are the indicators/items expected to have the same antecedents and consequences?	Nomological net for the indicators may differ Indicators are not required to have the same antecedents and consequences	Nomological net for the indicators should not differ Indicators are required to have the same antecedents and consequences

The criteria are summarized in table 1 in the form of questions that researchers can ask themselves in order to determine what the appropriate relationship is between their measures and their constructs.

TABLE 4

SUMMARY OF GOODNESS-OF-FIT STATISTICS FOR THE MODELS SHOWN IN FIGURE 3

Model	Position of mis-specified construct	Correlation level	χ^2	df	p	GFI	CFI	SRMR	RMSEA
1A correctly specified	Exogenous	.10	163.50	160	.44	.94	.99	.025	.007
1A misspecified	Exogenous	.40	282.20	166	.00	.20	.98	.042	.037
1B correctly specified	Exogenous	.70	163.77	160	.45	.94	.99	.022	.007
1B misspecified	Exogenous	.10	212.26	166	.05	.81	.99	.031	.023
1C correctly specified	Exogenous	.40	167.74	160	.46	.94	.99	.09	.007
1C misspecified	Exogenous	.70	177.35	166	.33	.93	.99	.022	.010
2A correctly specified	Endogenous	.10	163.56	160	.44	.94	.99	.033	.008
2A misspecified	Endogenous	.40	289.19	166	.00	.27	.98	.046	.038
2B correctly specified	Endogenous	.70	162.38	160	.46	.94	.99	.031	.007
2B misspecified	Endogenous	.10	242.70	166	.00	.47	.99	.043	.030
2C correctly specified	Endogenous	.40	164.03	160	.43	.94	.99	.031	.008
2C misspecified	Endogenous	.70	232.17	166	.01	.80	.99	.045	.028

NOTE.—Goodness-of-fit indices shown in bold indicate a lack of model fit.

Table 4 shows the goodness-of-fit indices for the correctly and incorrectly specified models. As expected, all of the correctly specified models fit the data adequately, according to every one of the fit indices (e.g., nonsignificant chi-square

Moves in Rhetorical Sections

- Particular moves

Methods of data analysis

A construct was classified as formative if it clearly met the majority of the criteria in the second column of this table and was classified as reflective if it met most of the criteria in the third column of this table.

Contributions of present research

to the best of our knowledge, no comprehensive list of criteria exists to help guide researchers who are struggling with this issue. The criteria are summarized in table 1 in the form of questions that researchers can ask themselves in order to determine what the appropriate relationship is between their measures and their constructs.

Annoucement of results

Table 2 summarizes our findings across all journals.

Overlap between text and visual

CRs in the Theoretical Section

The most commonly used latent variable measurement model is the principal factor model, where covariation among the measures is caused by, and therefore reflects, variation in the underlying latent factor. This is indicated in the first column of figure 1, in which each unidimensional construct is represented by a circle with several arrows emanating from it to a set of indicators. The direction of causality is from the construct to the indicators, and changes in the underlying construct are hypothesized to cause changes in the indicators, thus the measures are referred to as reflective (Fornell and Bookstein 1982) or effects (Bollen and Lennox 1991) indicators. In this model, the latent variable influences the indicators, accounting for their inter-correlations. Reflective indicators of a principal factor latent

CRs in the Results Section

Figure 4 reports the percent bias in the unstandardized structural parameter estimates for the misspecified model relative to the population value for each of the six correct models.



Mastery of Generic Features

- Linear readers managed the visual in the theoretical section/ a large degree of overlap between text and visual.
- Global readers managed visuals extended several rhetorical sections (literature review/ recommendations section).**
- **Readers with high visual skills were sensitive to generic features**
- The participants with good visual skills/background knowledge designed discipline-appropriate visuals.**

Verbal knowledge

- *Knowledge of lexical items*
- *Discourse connectors (conjuncts)*
- *Personal pronouns*
- *Features of CRs across rhetorical sections*

Voice

Process types

Theoretical

Key features | are summarized | in Figure 1

Verbiage **Verbal process** **Sayer**

Results

Table 3 reports findings from our review of the literature

Sayer verbal

See figure 1

Mental phenomenon

Mastery of Verbal Features

- **Verbal knowledge was more significant in CR-based task.**
- **Key concepts triggered background knowledge for the participants inside the discipline** and induced a short circuit hypothesis for those outside it.

Visual Meaning Functions

Awareness of Visual Meaning Functions

-Visuals fulfill three interrelated functions/ Representational, interactional and compositional (Lemke, 1998).

-**Representational function** “representing aspects of the world.” (Kress and van Leeuwen, 2006. p.42)

-narrative versus conceptual processes

-**Interactional function:** a semiotic sign should “project the relations between the producer of a (complex) sign, and the receiver/reproducer of that sign”. (Kress and van Leeuwen, 2006.p.43).

-Different semiotic resources: colours, shapes , salience... etc.

-**Compositional function:** Semiotic codes have the “capacity to form texts, complexes of signs which cohere both internally with each other and externally with the context in and for which they were produced (Kress and van Leeuwen, 2006. pp. 42-43).

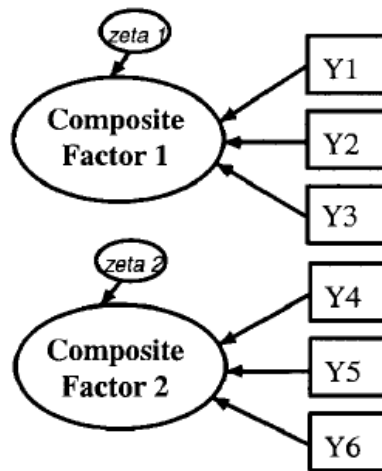
-information structure

-horizontal: theme and rheme /vertical: top down real ideal

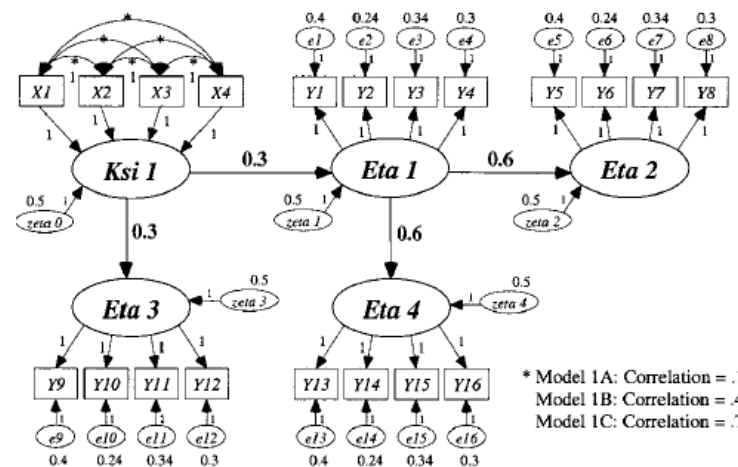
Representational function

- Simple Relationships
- Complex/ multi-levelled

Composite Latent Variable (Formative) Model



Correctly Specified Model 1: Formative Construct in Exogenous Position



The ability to differentiate Conceptual from Narrative Processes

Conceptual

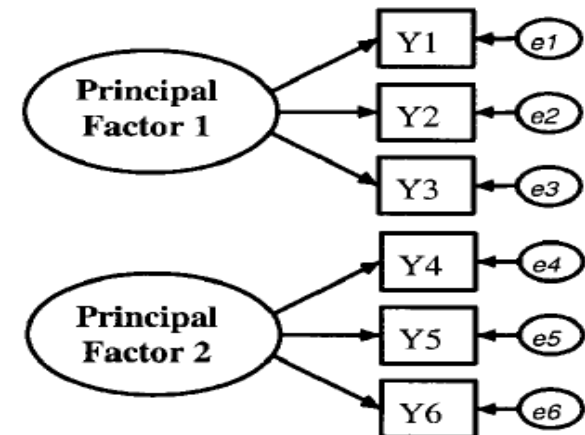
- Narrative

Principal Factor (Reflective) Model

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Mastery of Visual Knowledge

- The participants with poor visual skills managed the simple difficulties (first visual/simple relationships).
- The participants with good visual skills managed most meaning functions.**
- The participants should attain a threshold level of visual proficiency to exploit background knowledge.**
- Background knowledge induced a short circuit hypothesis for the participants with poor visual skills.

Mode affordance

- Different modes have different potentials in meaning construction, which are exploited by meaning-makers to advance communicative functions. (Kress, 2010).

To perform the tasks, the participants rely on several modes:

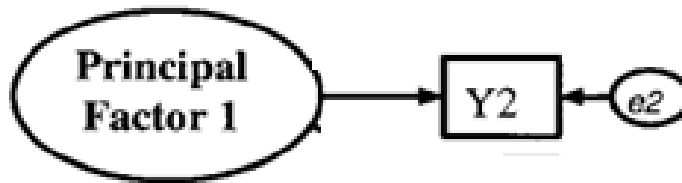
- The participants should be aware that:
- Modes have different resources/logics of representation (words versus space)
- Divergence in the logic of representation across the modes

Different logics/resources of meaning realization

The latent variable influences indicator.

Error is represented at the item level.

linear /left right/sentence-based



Bidirectional/ multiple resources

The Realization of a Narrative Process across the Modes

The latent variable | influences | the indicator.

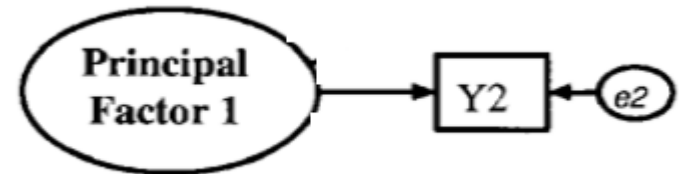
Actor Material Goal

Theme Rheme

Error | is represented | at the item.

Participant | Process Circumstance

Theme Rheme



Actor Material Goal

circumstance

Theme

Rheme

Theme

Differences/Divergence in Meaning Realization in Three Modes: the Design Task as an Example

- A challenge: the participants have to cope with the difference in meaning realization across three modes
- Table condenses information
- **But**
- It does not display tendencies, which does not facilitate comparisons.
- It is not a hierarchical system.
- Two points of departure: column head and header row

	Model A	Model B	Model C
Gamma 11	88	-89	-93
Gamma 31	0	0	0
Beta 21	555	411	343
Beta 41	554	410	344



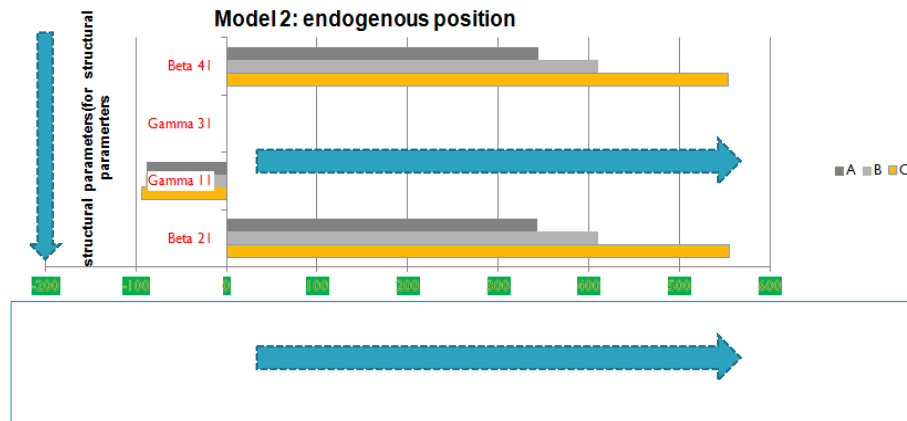
The Sentence is a Hierarchical System of Organization

(Estimates of Beta 4) (are positively biased 554 in model 2)

Theme

Rheme

The Graph a Hierarchical System



Differences in Information Structure

- Table is bidirectional

	Model A	Model B	Model C
Gamma 11	88	-89	-93
Gamma 31	0	0	0
Beta 21	555	411	343
Beta 41	554	410	344

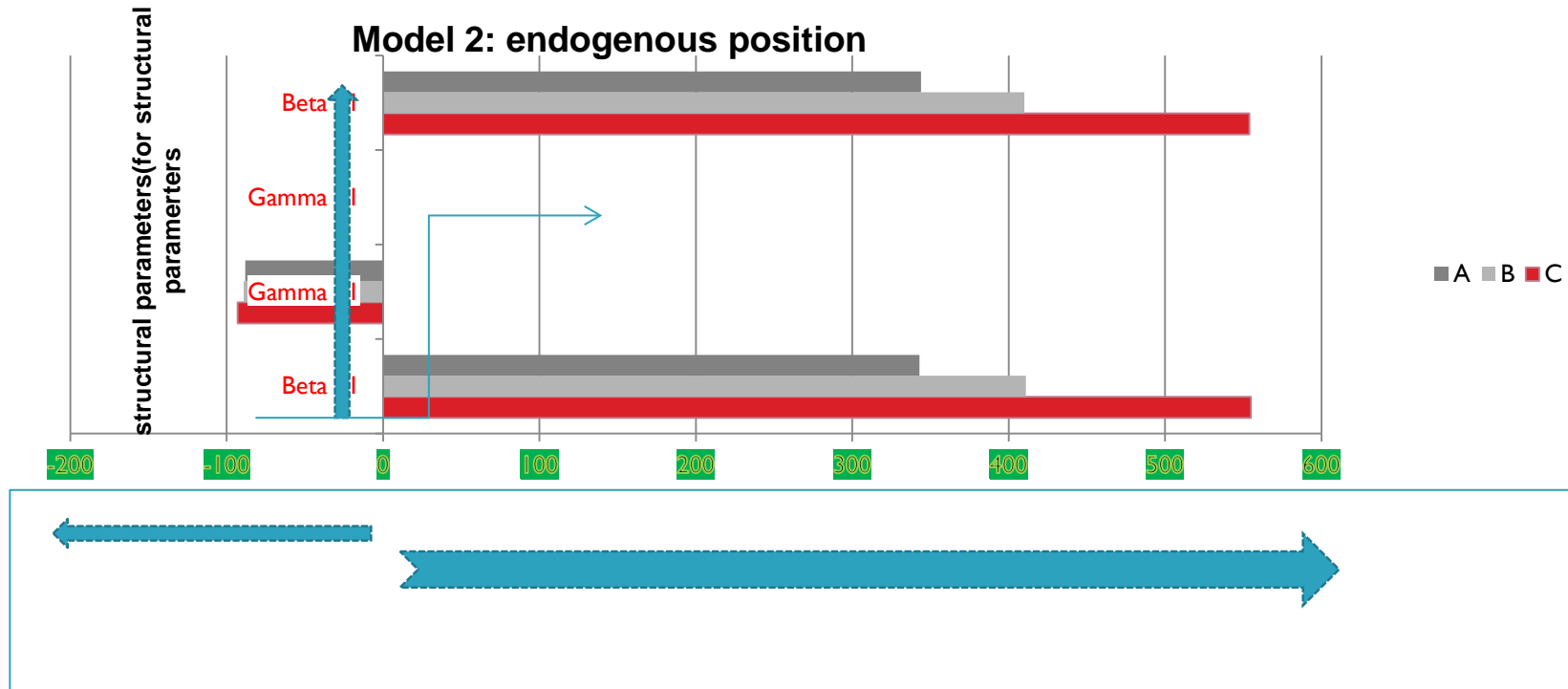
The sentence is linear

Estimates of Beta 41 are positively biased 554 in model 2



The graph is multilevelled

- Vertical/Horizontal





The Semiotic Codes Use Different Semiotic Resources

The table uses header rows, column heads cells and numbers

The sentence uses words

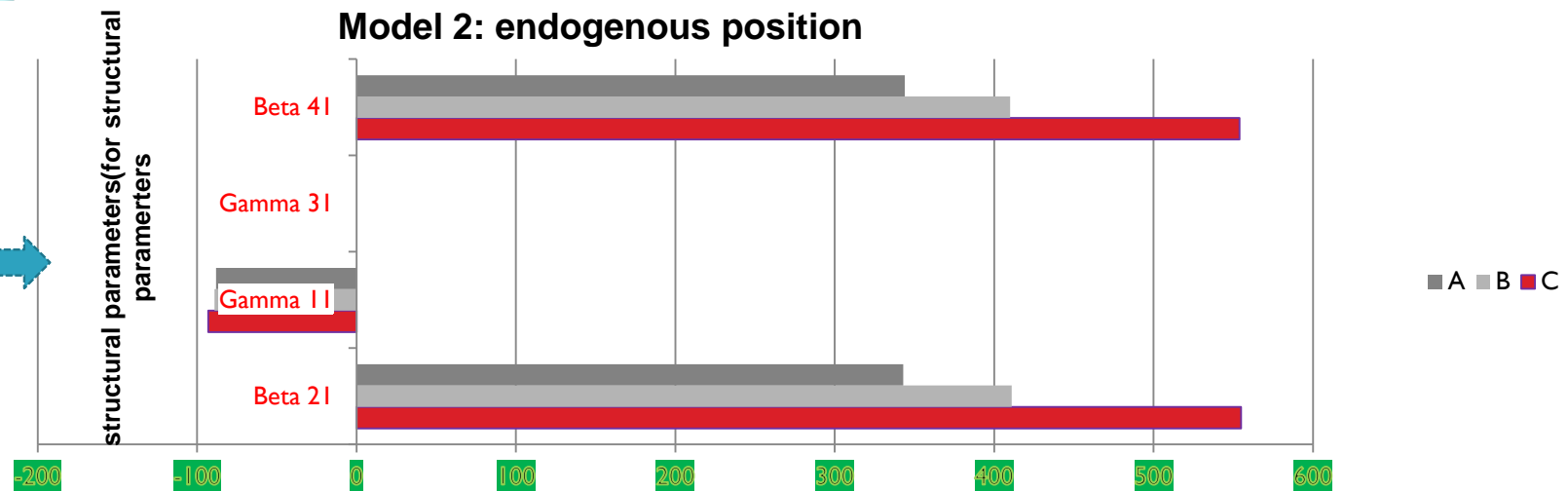
the graph uses words axes, bars and numbers

Different organizations and different resources



**Differences in Meaning Realization and
Distribution of Participants across the Modes**

	Model A	Model B	Model C
Gamma 11	-88	-89	-93
Gamma 31	0	0	0
Beta 21	555	411	343
Beta 41	554	410	344



Estimates of Beta 41 are positively biased 554 in model 2

Carrier

modifier

attribute + circumstance

Mastery of Mode affordance

- **The participants with good visual skills/background knowledge managed to cope with the variation in the realization of meaning and information structure across the modes.**
- The participants with poor visual skills failed to cope with mode potential and had problems with information organization and management of variables in a compact space



Recommendations

- Tunisian EAP context
- Cultural variety of multimodal literacy
- The effect of different literacy practices and academic contexts on multimodal literacy

Recommendations/ Suggestions

- Towards a Cultural Dimension of Multimodal Literacy



Tunisian EAP context  Cultural variety in multimodal literacy

The effect of different literacy practices and academic contexts on multimodal literacy development