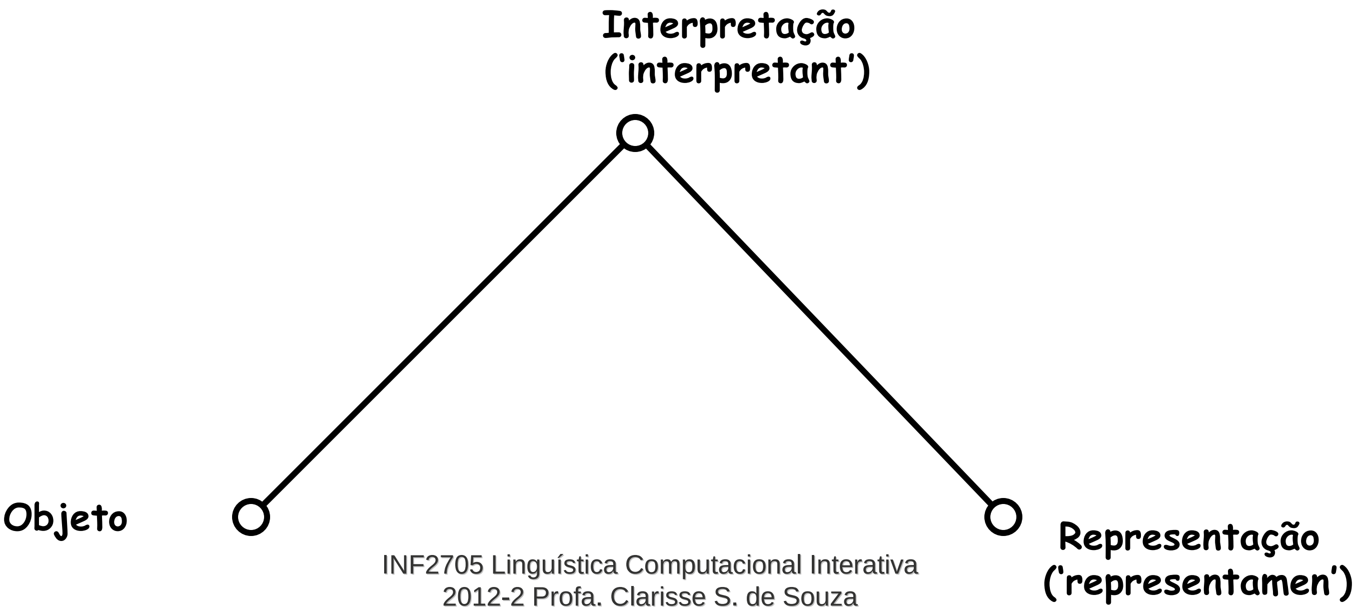
Linguística Computacional Interativa

Linguagem Natural em IHC: possibilidades a explorar

Aula de 13 de novembro de 2012

Um mergulho rápido na praia da Semiótica

- O signo peirceano: acesso mediado ao objeto


Interpretação
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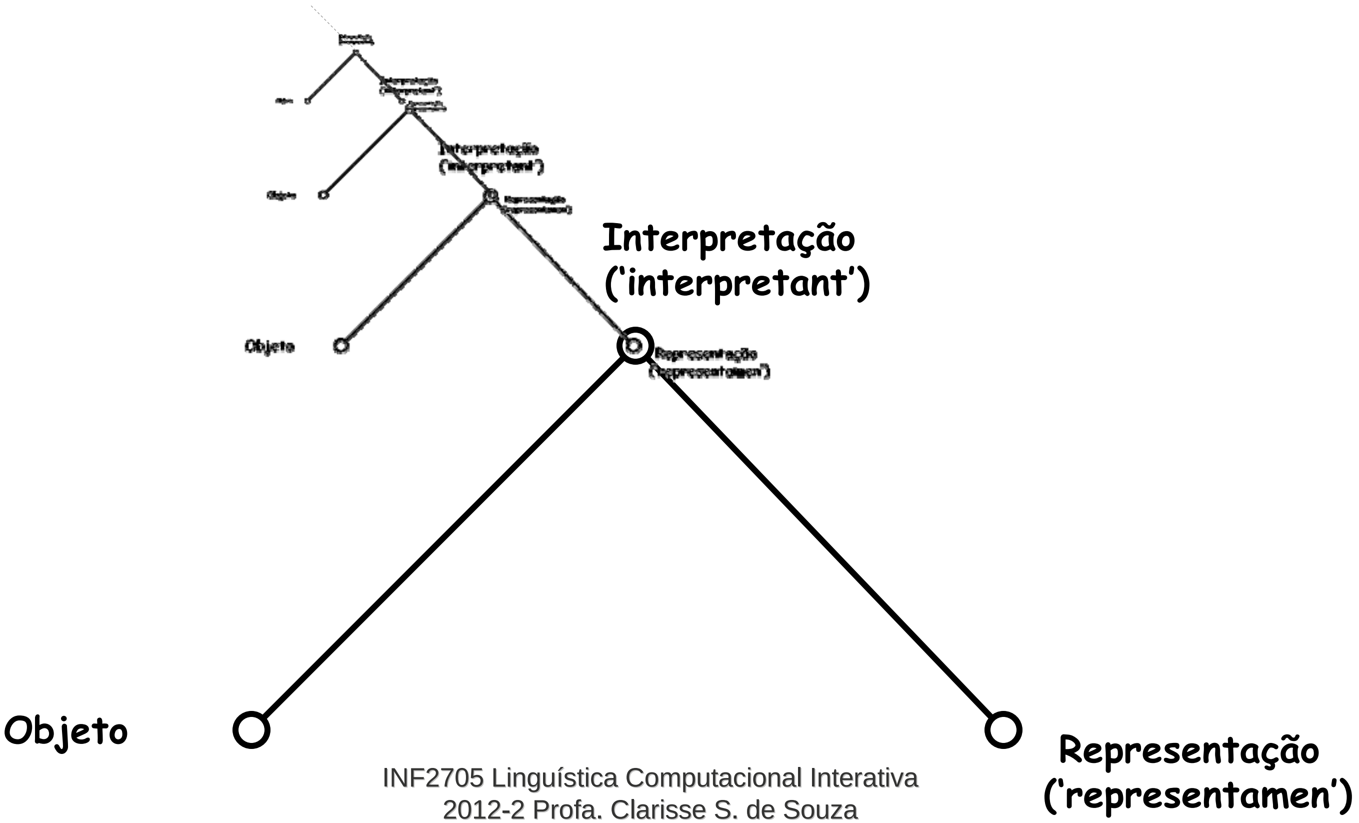
Objeto
Representação
('representamen')

Um mergulho rápido na praia da Semiótica

- O signo peirceano: semiose e auto-geração de signos


Interpretação
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Objeto
Representação
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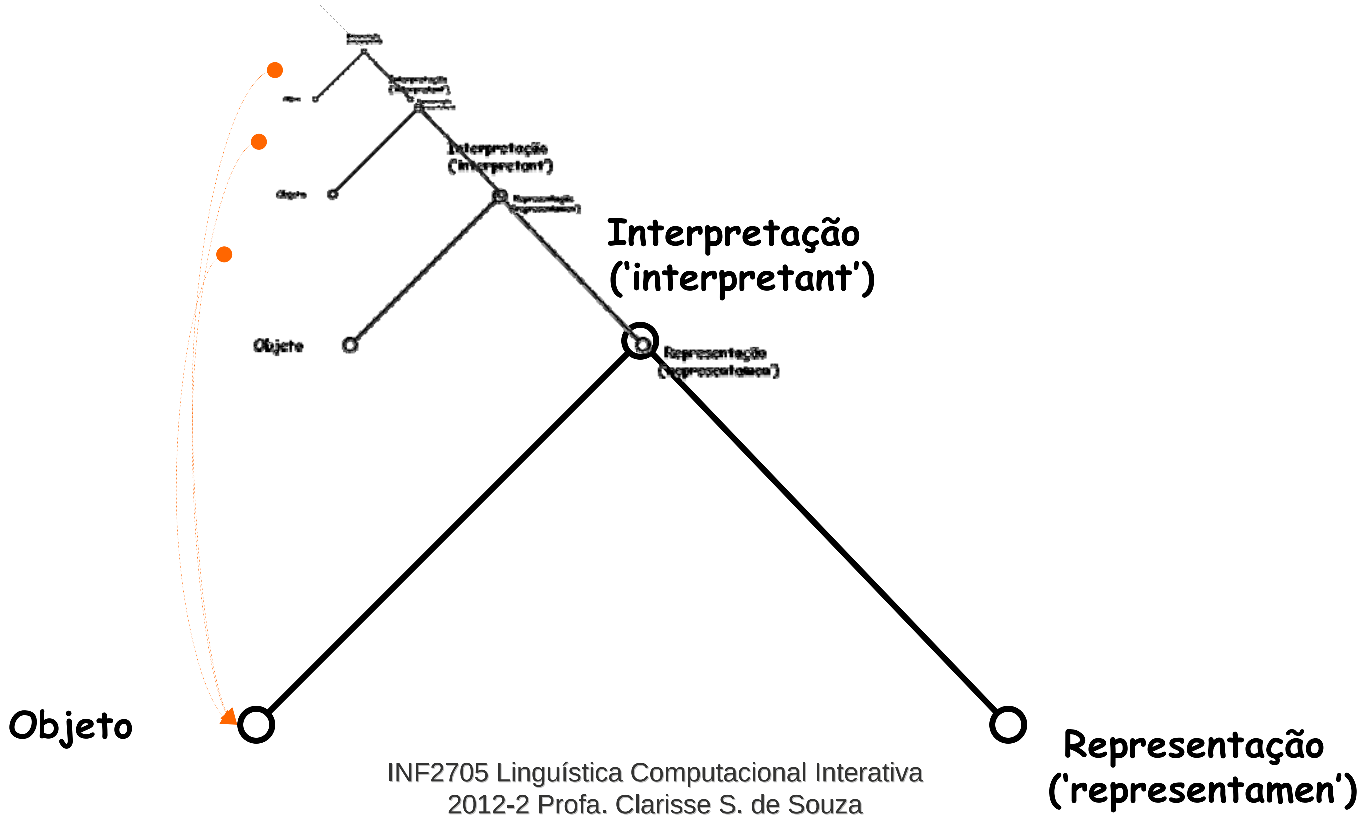
Um mergulho rápido na praia da Semiótica

- O signo peirceano: qual é o “objeto” de um signo?


Interpretação
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Objeto
Representação
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“Firstness, Secondness, Thirdness”

Quando a representação ressalta “firstness” – **ícones**

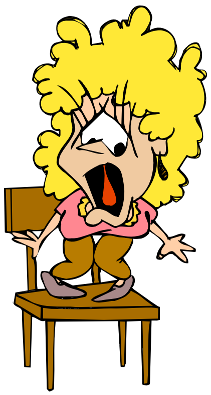
- **Expressão de qualidades primárias indiferenciadas do objeto**

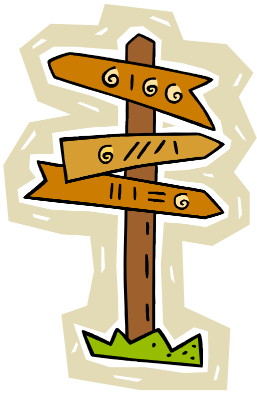
Quando a representação ressalta “secondness” – **índices**

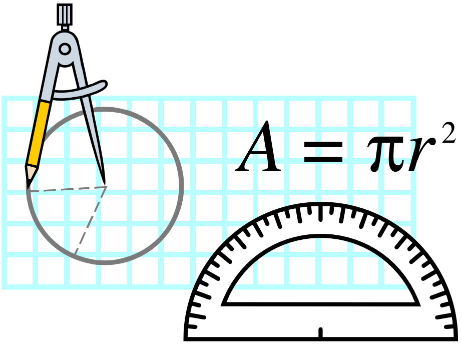
- **Expressão de elementos em contigüidade direta com o objeto**

Quando a representação ressalta “thirdness” – **símbolos**

- **Expressão convencionada/arrazoada do objeto**







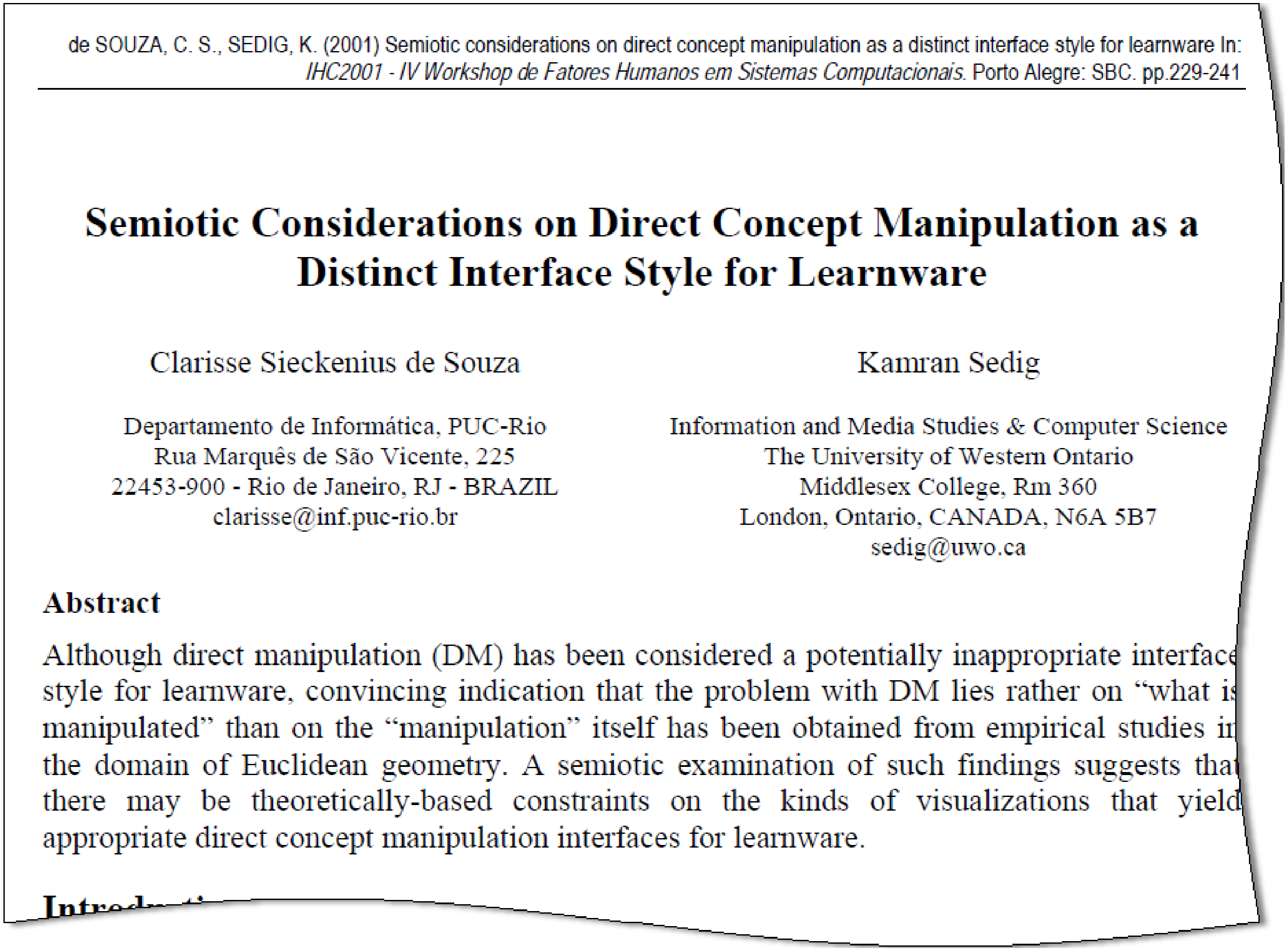
Linguagem Natural: Ícones, Índices, Símbolos?

- LN: convenção cultural → símbolos

- No entanto:
  - “João **rosnou** uma resposta rápida à provocação de Pedro.”
  - “**Oh, não!** Tudo de novo?”

  - “Quem leva **a serpentina** para o churrasco de fim de ano?”
  - “**Brasília** é que decide se isto vira lei ou não.”

A LN traz em si os mecanismos de (meta)representação icônica, indicial e simbólica, tão frequentes e expressivos na comunicação verbal falada e escrita. Nós, falantes nativos de uma LN, trazemos esta competência “no sangue”. ☺



de SOUZA, C. S., SEDIG, K. (2001) Semiotic considerations on direct concept manipulation as a distinct interface style for learnware In: *IHC2001 - IV Workshop de Fatores Humanos em Sistemas Computacionais.* Porto Alegre: SBC. pp.229-241

Semiotic Considerations on Direct Concept Manipulation as a Distinct Interface Style for Learnware

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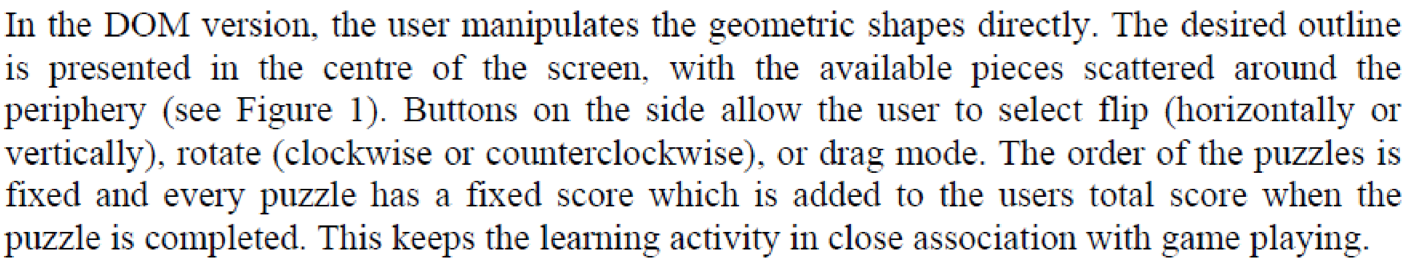
Abstract

Although direct manipulation (DM) has been considered a potentially inappropriate interface style for learnware, convincing indication that the problem with DM lies rather on "what is manipulated" than on the "manipulation" itself has been obtained from empirical studies in the domain of Euclidean geometry. A semiotic examination of such findings suggests that there may be theoretically-based constraints on the kinds of visualizations that yield appropriate direct concept manipulation interfaces for learnware.

Introducti

De Sedig et al., 2001: DOM



In the DOM version, the user manipulates the geometric shapes directly. The desired outline is presented in the centre of the screen, with the available pieces scattered around the periphery (see Figure 1). Buttons on the side allow the user to select flip (horizontally or vertically), rotate (clockwise or counterclockwise), or drag mode. The order of the puzzles is fixed and every puzzle has a fixed score which is added to the users total score when the puzzle is completed. This keeps the learning activity in close association with game playing.

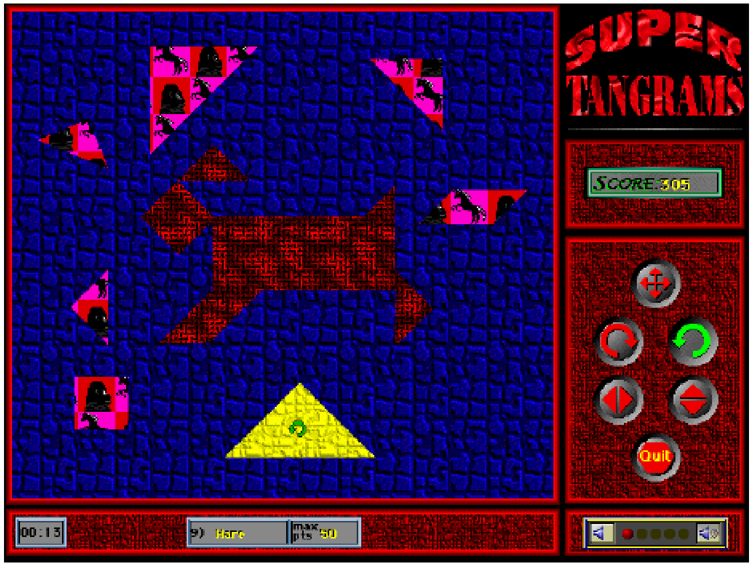


Figure 1: A snapshot of the DOM HCI style in ST

De Sedig et al., 2001: DCM

In the DCM version, the user directly manipulates visual representations of the transformation concepts rather than the shapes themselves. The screen has a coarse grid in the background and the concept of 'selected piece' is introduced (see Figure 2). The user chooses a shape (shown by the piece having a different pattern), the operation (*Slide*, *Turn*, or *Flip*), and this causes the transformation representation and the ghost image of the shape to appear. As indicated in Figure 2, when *Turn* is selected the transformation representation is an arc attached to one vertex of the selected shape. The arc has a moveable centre and endpoint.
Manipulating the centre changes the centre of rotation and adjusting t
angle of rotation. Similarly, *Slide* and *Flip* cause visual represe
concepts to appear and be available for manipulation. Transla
manipulating a directed resizable vector with three handles:
Manipulations of the head and tail alter the direction or the length o
ghost image of the object to shift its location, whereas manipulatio
vector cause no changes to the ghost image. Reflection is obtained by
reflection with two handles. One controls the location of the axis; the
of reflection.

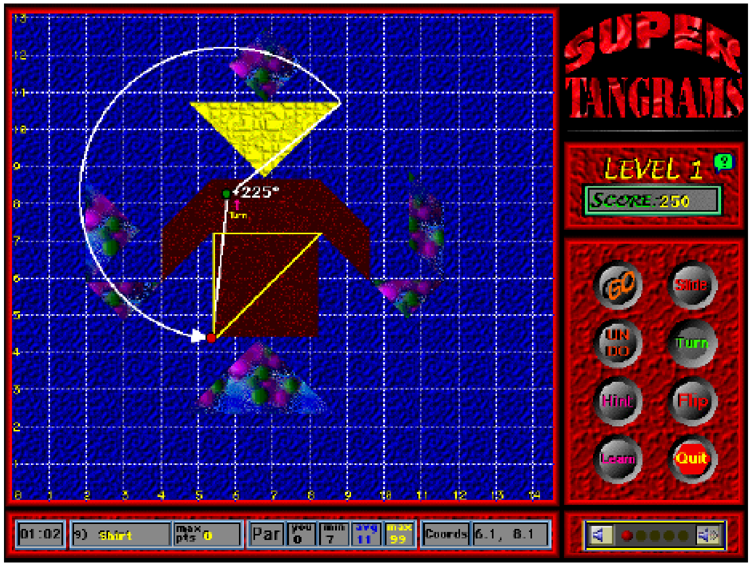


Figure 2: A snapshot of the DCM HCI style in ST

De Sedig et al., 2001: RDCM

Finally, the RDCM version allows users to manipulate transformation representations as in DCM, except that a number of features are added. Children interact with the concepts in a progressively differentiated manner which is intended to cause epistemic conflict [Forman & Pufall, 1988]. The representations progressively fade over three levels. In the case of translations, for example, *Level* 1 allows children to interact with the most generalized notion of translation without having to be concerned with the details and specifics of the concept. *Level* 2 does not display the ghost image of the object being translated. Without a visual feedback of this sort, children must pay more attention to the appro vector's extremities and their relation to the final state of the geometri the tail of the arrow is fixed to a certain coordinate, leading children grid and become conscious of the length and direction of the translatio the final desired state of the operation. Figure 3 shows a snapshot of S a translation operation.

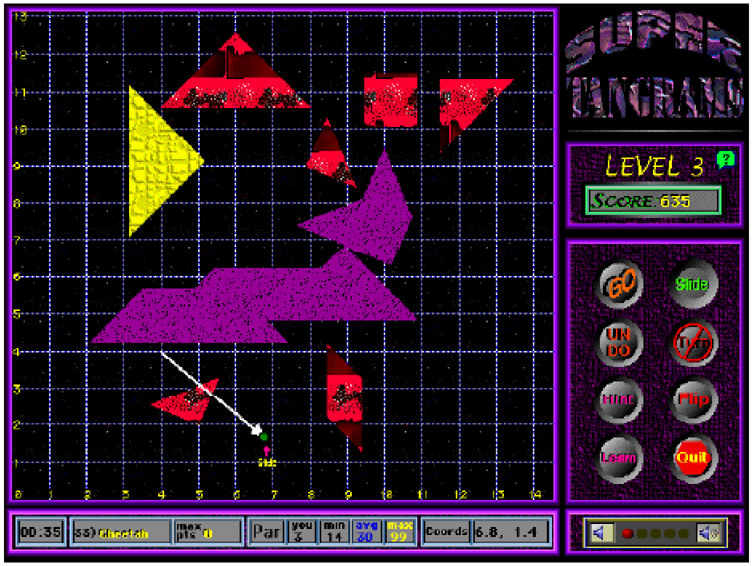


Figure 3: A snapshot of the RDCM HCI style in ST

De Souza & Sedig, 2001: Essência do Argumento

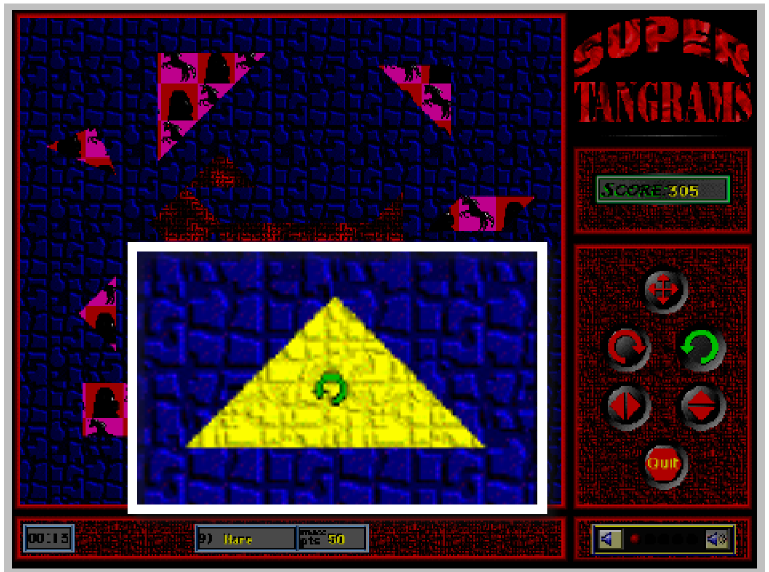

SUPER
TANGRAMS
SCORE:305
Quit
00:13

Figure 1: A snapshot of the DOM HCI style in ST

Priorização de "firstness" :

Ninguém aprende sobre ângulos e eixos de rotação.
Razões e Convenções passam ao largo.

De Souza & Sedig, 2001: Essência do Argumento

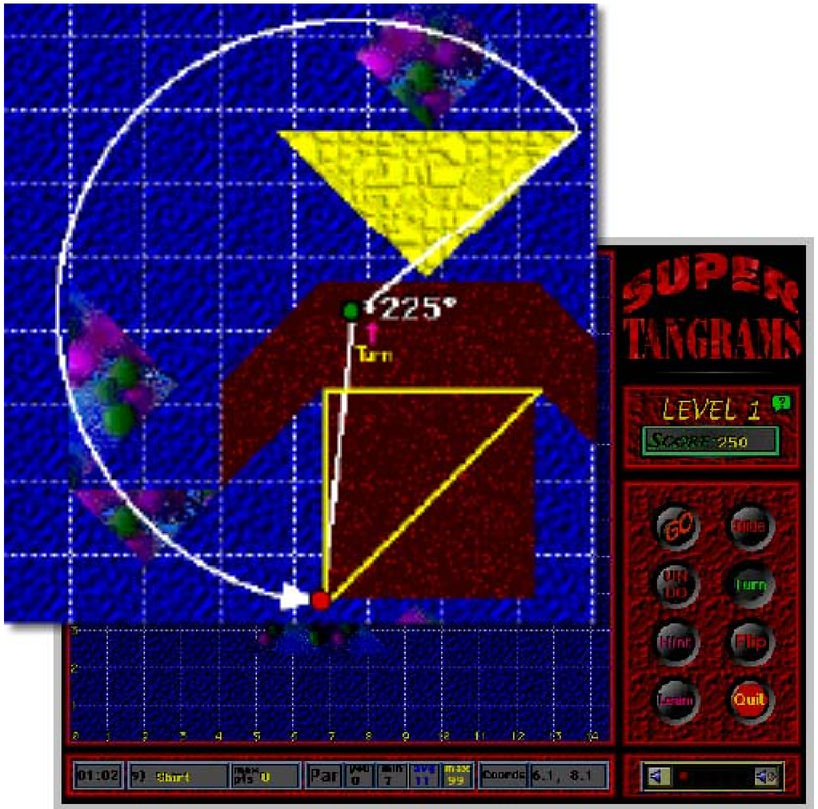

225°
Turn
SUPER TANGRAMS
LEVEL 1
SCORE 250
GO
Slide
Un do
Turn
Hint
Flip
Learn
Quit
01:02
Start
Par
Coords 6.1, 8.1

Figure 2: A snapshot of the DCM HCI style in ST

Utilização de “secondness” :

Aparecem “rastros” (índices) do
efeito de valores associados a parâmetros
da rotação.
Representação “revela” a regra.

De Souza & Sedig, 2001: Essência do Argumento

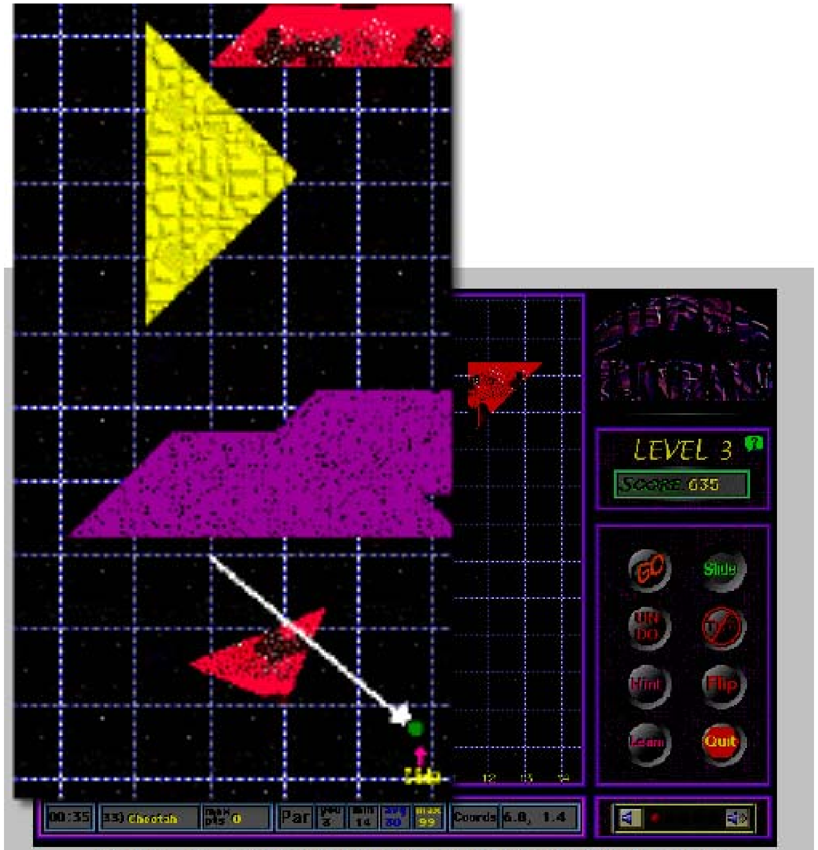

LEVEL 3
Score 635
GO
Slide
UNDO
Hint
Flip
Learn
Quit
Par
Coords 6.0, 1.4

Figure 3: A snapshot of the RDCM HCI style in ST

Expressão em “thirdness” :

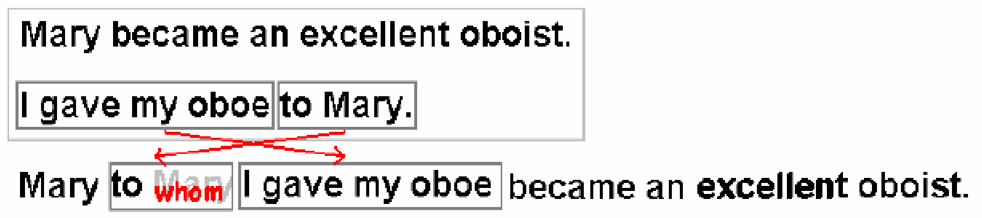
Desaparecem “rastros” da operação.
O aprendiz só pode expressar-se
através da comunicação (visual)
dos valores que quer atribuir
aos parâmetros da rotação.

**Se souber fazer isto, aprendeu
a ‘geometria’ da rotação.**

De Souza & Sedig, 2001: Uma conclusão

Visual codes include static and dynamic forms. Static forms are visualizations; dynamic forms are manipulations. So a concept is not necessarily represented by a static form — it can be represented by a manipulation of visual forms. The decision on how to express the possibility of manipulation (typically by the use of a handle) is secondary to the decision of which kind of manipulation pattern to use. An adequate integration (or embedding) of signs of interactive possibilities into signs of domain concepts may not be an easy or even feasible task.

For instance, if learners are expected to acquire the appropriate grammatical knowledge for producing embedded sentences with the pronoun *whose* in English, the use of DCM and RDCM interfaces is a major design challenge. Alhough advanced grammatical studies in Linguistics eventually lead learners to represent syntactic structures by means of trees or graphs, by the time this knowledge is taught to students the use of trees and graphs is excessively abstract. The alternative teaching aid is often one of resorting to metaphors, like bounding boxes around phrases, arrows directing the movement of syntactic constituents, and colored overwriting to indicate pronominal substitutions (see Figure 7).



Mary became an excellent oboist.

I gave my oboe to Mary.

Mary to whom I gave my oboe became an **excellent** oboist.

Figure 7: Visualizing embeddings of wh- clauses in English

Leitura Recomendada

- de Souza, C.S.; Sedig, K. (2001) Semiotic considerations on direct concept manipulation as a distinct interface style for learnware. In: IHC2001 - IV Workshop de Fatores Humanos em Sistemas Computacionais, 2001, Florianópolis. Anais do IHC2001 - IV Workshop de Fatores Humanos em Sistemas Computacionais. Porto Alegre : Sociedade Brasileira de Computação, 2001

Online em: http://www.inf.puc-rio.br/~clarisse/docs/2001desouzaIHC.pdf

E a Linguagem Natural?

Voltando a aulas anteriores …

1. Signos comunicados em LN podem/devem articular-se com signos comunicados através de outros sistemas de significação para **comunicar a intenção** do designer, desenvolvedor, usuário ou quem mais esteja querendo se expressar através de artefatos de software.

2. A articulação de signos expressos em diferentes sistemas de significação para que comuniquem eficaz e eficientemente uma intenção é uma **peça de engenharia semiótica**.

3. A Linguística Computacional Interativa, portanto, **trata de LN mas não pode/deve se restringir a ela**, uma vez que a eficácia e eficiência da comunicação através de software sempre envolve mais de um sistema de significação.

4. Múltiplos sistemas de significação articulados entre si para comunicar uma intenção de design são **a essência da "interatividade"** que caracteriza IHC.