Towards Formal Pragmatics based on Ludics Part I

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Sommaire

Formalisation of dialogue in Ludics : first step

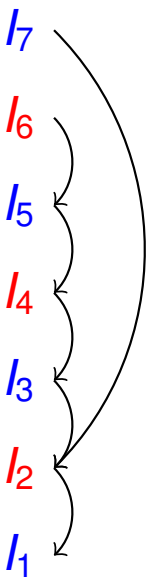
The object “dialogue” is reduced to a sequence of interventions. We may focus on :

- the first one which starts the exchange;
- the alternance of interventions
- Each intermediate intervention
  - is anchored on some previous one and
  - creates new “openings” from which the adresse should continues the dialogue.

Example

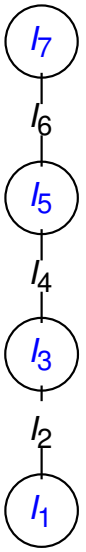
F	l_1 : Who could benefit from your death ?
	What was your life at this time ?
E	l_2 : I was ready to become captain of the *Pharaon*; I was about to marry a beautiful young girl.
F	l_3 : Was anyone interested in you not becoming the captain of the *Pharaon* ?
E	l_4 : [. . .], Only one man. [. . .],
F	l_5 : Who was he ?
E	l_6 : Danglars.
F	l_7 : Well, tell me about that young girl . . .

Alternate sequence of “justified” interventions

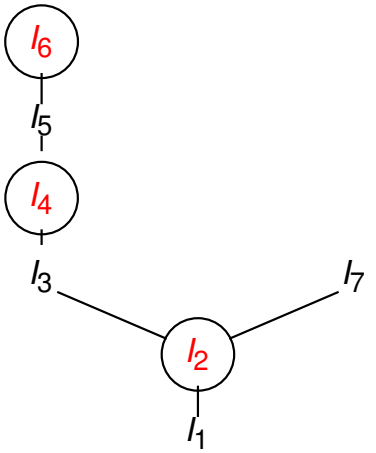


l_1 : Who could benefit from your death ? What was your life at this time ?
l_2 : I was ready to become captain of the *Pharaon*; I was about to marry a beautiful young girl.
l_3 : Was anyone interested in you not becoming the captain of the *Pharaon* ?
l_4 : [. . .], Only one man. [. . .],
l_5 : Who was he ?
l_6 : Danglars.
l_7 : Well, tell me about that young girl . . .

The dialogue seen from each locutor's view



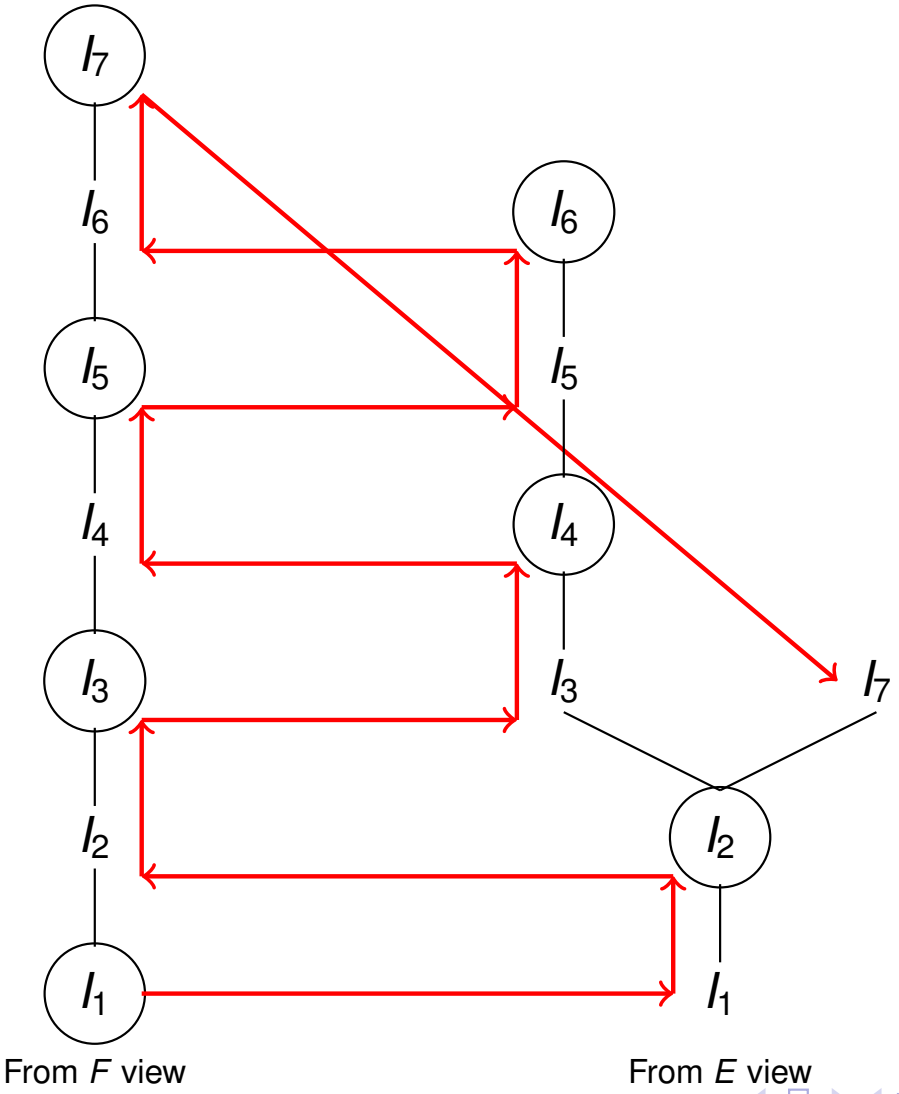
From *F* view



From *E* view

l_1 : Who could benefit from your death ? What was your life at this time ?
l_2 : I was ready to become captain of the *Pharaon*; I was about to marry a beautiful young girl.
l_3 : Was anyone interested in you not becoming the captain of the *Pharaon* ?
l_4 : [. . .], Only one man. [. . .],
l_5 : Who was he ?
l_6 : Danglars.
l_7 : Well, tell me about that young girl . . .

The dialogue as an interaction between two designs



Formalisation of Dialogues in Ludics: first step

- Intervention = action which is a step inside an interaction and then is either initial or justified by a previous action.
- The dialogue seen from the view of one locutor = a design
  A set of (pairwise coherent) alternated sequences of actions.
- The dialogue : The trace of an interaction between two designs.

Convergent/divergent dialogues

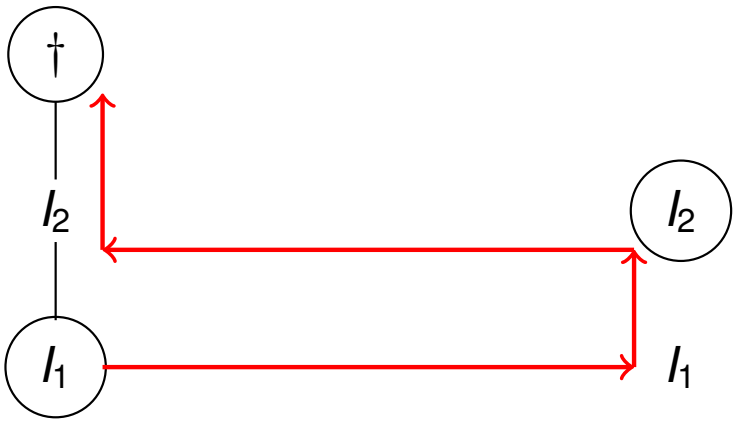
As this level, we used a strategy-like representation of designs. An interesting contribution of Ludics is that Ludics enables to distinguish between convergent and divergent interaction.

In Ludics there is some special actions called **daïmon** which terminates the interaction *in a convergent way*.

Example 1: a convergent dialogue

Example

– When will start the next train for Paris ?
– At 19h45.
– Thanks.



From the traveller's view

From the SNCF employee's view

l_1: When will start the next train for Paris ?
l_2: At 19h45.
$l_3 = \dagger$: Thanks.

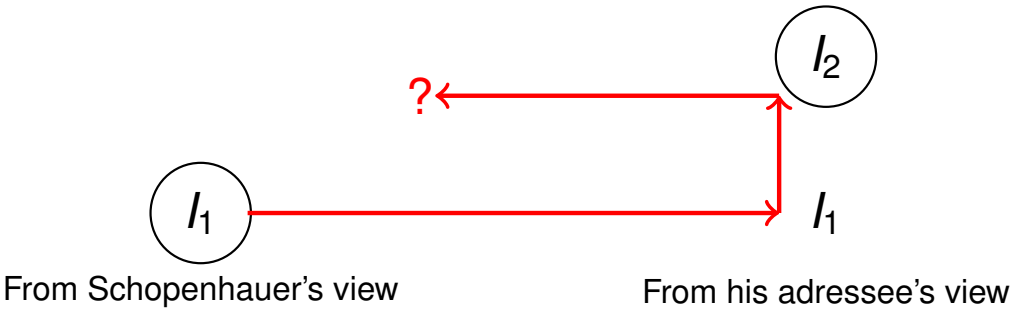
Example 2: a divergent dialogue

The following example is drawn from the book of Schopenhauer "Dialectica eristica". It is given to illustrate the first stratagem.

Example

I asserted that the English were excellent in dramatic art. My opponent attempted to give an instance of the contrary, and replied that it was a well-known fact that in **opera**, they were bad. I repelled the attack by reminding him that dramatic art only covered **tragedy** and **comedy** [. . .]

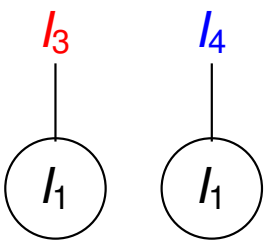
Example 2: a divergent dialogue



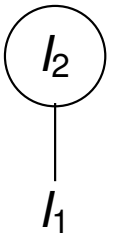
I_1: : The English are excellent in dramatic art.
I_2: I disagree, it is a well-known fact that in opera, they could do nothing at all.
?: But by "dramatic art, I only mean tragedy and comedy (the design according to which I accept the exchange does not converge with the one that you propose.).

Example 2: a divergent dialogue

We may give an account of the divergence in a more **explicite** way, by means of the designs associated with the views of the two locutors:



From Schopenhauer's view



From his adressee's view

l_1: : The English are excellent in dramatic art.
l_2: I disagree, it is a well-known fact that in opera, they could do nothing at all.
?: But by "dramatic art, I only mean tragedy and comedy.

First application for pragmatical issues

We will use a first refinement of the formalisation of dialogues:

Interventions are not only actions but more elaborated objects: sequences of actions and then designs themselves.

Presupposition

Presupposition is an implicit assumption about the world or background belief relating to an utterance whose truth is taken for granted in discourse.

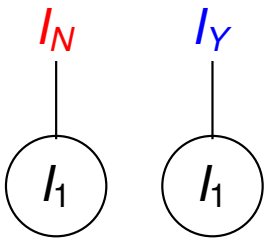
Example

The judge to the young delinquent: *"Do you still beat your father ?"*.

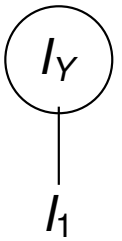
The judge imposes to the delinquent the following exchange: – *"Did you beat your father?"*
– *"Yes"*
–*"Do you stop beating him ?"*.

The “virtual” exchange:

The (non terminated) dialogue:
–“Did you beat your father ?”
–“Yes”
may be represented by :



From the judge’s view

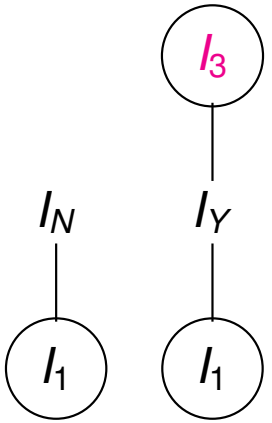


From the young delinquent’s view

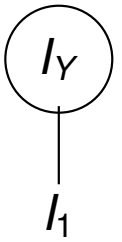
The judge was ready to receive as answer: “No” or “Yes”

The “virtual” exchange:

Only the second tree of the design associated with the judge’s view may be continued to have the dialogue:
–“Did you beat your father ?”
–“Yes”
– “Do you stop beating him ?” :



From the judge’s view

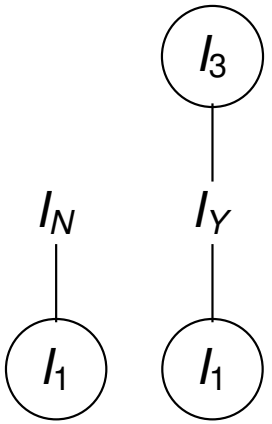


From the young delinquent’s view

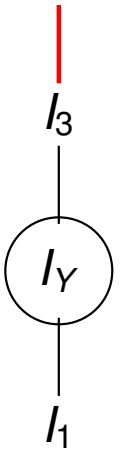
Intervention using presupposition

The judge's intervention using presupposition: "Do you stop beating your father ?" is not only an action but a more elaborated object: a design (here a sequence of actions):

The trap: keeping the convergence



From the judge's view



From the young delinquent's view

If the young delinquent accepts to answer according to this configuration (keeping the convergence) he is trapped.

Refinement of formalisation: using localization

In order to deepen the use of the formalisation of dialogues into Ludics we refine it.

Next step

We will now use another characteristic of Ludics: localisation.

It will be interesting for applications to more complex argumentation situations and for semantical issues.

Actions in Ludics

An action is given by three datas:
- a **polarity** (one protagonist's view being fixed, this protagonist's action (intervention) are positive, the ones of his adressee are negative),
- a **focus**, that is the location (*locus*) of the action. Technically it is a finite sequence of integers.
- a **ramification**, which represents the finite set of locations which can be reached in one step. Technically a ramification is a finite set of integers.

A special positive move is provided by the so called **daïmon**, denoted by †.

A proof-like presentation of designs

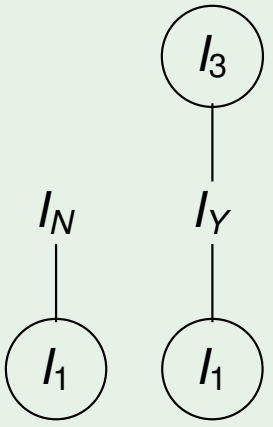
With such a definition of actions we use a proof-like presentation of design instead of a strategy-like one.

Example

The dialogue between the judge and the young delinquent seen from the view of the judge:

$$\dfrac{\vdash \xi 02 \qquad \dfrac{\xi 010 \vdash}{\vdash \xi 01}\, I_3}{\dfrac{\xi 0 \vdash}{\vdash \xi}\, I_1}$$

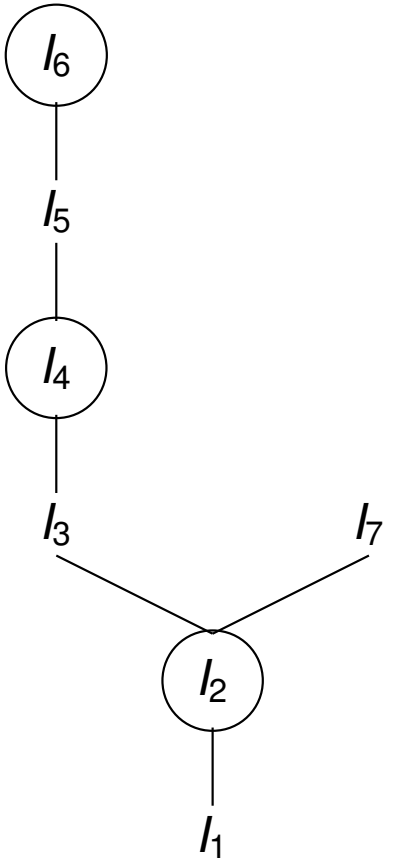
instead of



The dialogue between Faria and Edmond seen from the view of Edmond:

$$\dfrac{\dfrac{\dfrac{\dfrac{\dfrac{011111 \vdash}{\vdash 011111}\,l_6}{01111 \vdash}\,l_5}{\vdash 0111}\,l_4 \qquad \vdots \qquad \dfrac{}{\vdash 0122}\,l_7}{011 \vdash \qquad 012 \vdash}\,l_3}{\vdash 01}\,l_2}{0 \vdash}\,l_1$$

instead of



Rhetorical issues

Example

The fourth stratagem of Schopenhauer If you want to draw a conclusion, you must not let it be foreseen, but you must get the premisses admitted one by one, unobserved, mingling them here and there in your talk: otherwise, your opponent will attempt all sorts of chicanery. Or, if it is doubtful whether your opponent will admit them, you must advance the premisses of these premisses; that is to say, you must draw up pro-syllogisms, and get the premisses of several of them admitted in no definite order. In this way you conceal your game until you have obtained all the admissions that are necessary, and so reach your goal by making a circuit.

The fourth stratagem

Some dialogical exchanges took place. The speaker affirmed *A*, which was accepted by his adressee. In the same way, he affirmed *B*, which was also accepted by his adresse:
- *A* was played at an arbitrary locus α
- *B* was played at an arbitrary locus β,
(the propositions *A* and *B* are the premisses of the thesis that the speaker will draw).

The fourth stratagem

The following interactions took place:

$$\dfrac{\alpha.0 \vdash}{\vdash \alpha}\ \text{Speaker's view} \qquad \dfrac{\dfrac{}{\vdash \alpha.0}\,\dagger}{\alpha \vdash}\ \text{His adresses's view}$$

S asserted *A*
which was accepted.

$$\dfrac{\beta.0 \vdash}{\vdash \beta}\ \text{Speaker's view} \qquad \dfrac{\dfrac{}{\vdash \beta.0}\,\dagger}{\beta \vdash}\ \text{His adressee's view}$$

S asserted *B*
which was accepted.

We denote by:

$$\mathcal{D}_\alpha = \dfrac{\alpha 0 \vdash}{\vdash \alpha} \text{ and } \mathcal{D}_\beta = \dfrac{\beta 0 \vdash}{\vdash \beta}$$

The "winning" designs of the speaker respectively based on $\vdash \alpha$ et $\vdash \beta$.

The fourth stratagem

Now, we come back to the dialogue in progress: S is asserting his thesis T, arguing it by means of the premises A and B and disclosing his stratagem.
This intervention " T is the consequence of A and B that you admitted " is represented by the following design $\mathcal{D}$, arbitrary located in ξ:

$$\frac{\begin{array}{ccc}\mathcal{D}_a & \mathcal{D}_b & \\ \vdots & \vdots & \\ \xi.1 \vdash & \xi.2 \vdash & \xi.3 \vdash\end{array}}{\vdash \xi}$$

$\xi.1$ is the location of the argument A,
$\xi.2$ is the location of the argument B
$\xi.3$ is the location of the implication: from A and B follows T.

To build his intervention, *S* uses the following designs:

- $\mathcal{D}_a$ is built from the winning design $\mathcal{D}_\alpha$ by using:
  - delocalisation from α into a sublocus of ξ.
  - shift (from an assertion to an argument).
- In the same way $\mathcal{D}_b$ is built from the winning design t $\mathcal{D}_\beta$ by means of delocalisation and shift.

The intervention de S is an elaborated design

$$\dfrac{\dfrac{\downarrow [[\mathcal{D}_\alpha, \mathfrak{F}ax_{\alpha,\xi.1.0}]] \quad \vdots \quad \vdash \xi.1.0}{\xi.1 \vdash} \quad \dfrac{\downarrow [[\mathcal{D}_\beta, \mathfrak{F}ax_{\beta,\xi.2.0}]] \quad \vdots \quad \vdash \xi.2.0}{\xi.2 \vdash} \quad \xi.3 \vdash}{\vdash \xi}$$

S is then in a good position to win the controversy.

In order to converge with this intervention of S, during the dialogue in progress, his adresse has to develop the following design:

$$\dfrac{\dfrac{\dfrac{\xi.1.0.0 \vdash}{\vdash \xi.1.0}}{\xi.1 \vdash} \quad \dfrac{\dfrac{\xi.2.0.0 \vdash}{\vdash \xi.2.0}}{\xi.2 \vdash} \quad \xi.3 \vdash}{\vdash \xi} \qquad \dfrac{\dfrac{\dfrac{\dfrac{\vdash \xi.1.0.0, \xi.2.0.0, \xi.3}{\xi.2.0 \vdash \xi.1.0.0, \xi.3}}{\vdash \xi.1.0.0, \xi.2, \xi.3,}}{\xi.1.0 \vdash \xi.2, \xi.3}}{\vdash \xi.1, \xi.2, \xi.3} \quad \dfrac{}{\xi \vdash}$$

Speaker's view

His adressee's view

Meaning via interaction

A based on Ludics interpretation of utterances.

Ludics is used as:

- an epistemological and methodological framework : in the same way that a design is defined by its orthogonal ones we will consider that the meaning of a sentence is given by its dual ones, that is the ones with which the interaction converges.
- a formalisation framework : we will associate with the meaning of a sentence a set of designs.

The “logical form”

Logical Form is generally used to show the evidence of distinct readings for a sentence.
We wish to show that it is dispensable if we take the interactive fact into consideration.

A traditional example

Let us consider the utterance:

(1) “Every linguist speaks some african language”.

Usually two possible logical forms are associated with it according to *some* has the narrow or wide scope :

$$S_1 = \forall x(L(x) \Rightarrow \exists y(A(y) \wedge P(x,y)))$$
$$S_2 = \exists y(A(y) \wedge \forall x(L(x) \Rightarrow P(x,y)))$$

“Dual” sentences enable to discriminate

The interaction of some dual utterances with our sentence is relevant provided that

- “some” has the narrow scope :
  (a) There is a linguist who does not know any african language.
  (b) Does even Chomsky speak any african language ?
  (c) Which is the African language spoken by Chomsky ?
- “some” has the wide scope :
  (d) There is no african language which is spoken by all the linguists.
  (e) Which is this african language that every linguists speak ?

Designs discriminated by their first action

$$\dfrac{\dfrac{\ldots \vdash x.1.n. \ldots \vdash x.1.5. \ldots \vdash x.1.m. \ldots}{x.1 \vdash}}{\vdash x} \quad \Big| \quad \dfrac{\dfrac{x.1.5 \vdash}{\vdash x.1} \qquad \vdash x.2}{x \vdash}$$

Every linguist speaks some african language.

Does even Chomsky speak any african language ?

$$\dfrac{\dfrac{\ldots \vdash x.1.n. \ldots \vdash x.1.5. \ldots \vdash x.1.m. \ldots}{x.1 \vdash}}{\vdash x} \quad \Big| \quad \dfrac{\vdash x.1 \qquad \dfrac{x.2.0 \vdash}{\vdash x.2}}{x \vdash}$$

Every linguist speaks some african language.

Which is the african language that every linguist speaks ?

A set of designs starting with the same actions

$$\dfrac{\vdash x.1.n \qquad \dfrac{x.1.5.9 \vdash \quad x.1.5.9 \vdash}{\vdash x.1.5}\,E_3 \qquad \vdash x.1.m}{\dfrac{x.1 \vdash}{\vdash x}\,E_1}$$

$\mathcal{D}_{d'}$: $\vdots$; $\mathcal{E}$: $\vdots$; $\mathcal{E}'$: $\vdots$; $\mathcal{D}_{d''}$: $\vdots$

E_1 : Every linguist speaks some african language.
chooses one of the two acceptions ($\forall\exists$ ou $\exists\forall$)
The interaction may continue for each linguist ;
Some utterance E_3 enables to exhib the language that such or such linguist speaks. ;
The design $\mathcal{E}$ is one justification of “This language is an african language”
The design $\mathcal{E}'$ is one justification of “The linguist which we consider speaks such language ”

Designs which look like some proof

$$\dfrac{\mathcal{D}_{d'} \quad \dfrac{\dfrac{\vdots}{\vdash A(e_d)}\,E_5}{\downarrow A^{\perp}(e_d) \vdash} \quad \dfrac{\dfrac{\vdots}{\vdash P(d,e_d)}\,E'_5}{\downarrow P^{\perp}(d,e_d) \vdash} \quad \mathcal{D}_{d''}}{\dfrac{\vdots \quad \vdash \downarrow L^{\perp}(d), \oplus_y(\uparrow A(y) \otimes \uparrow P(d,y)) \quad \vdots}{S_1^{\perp} \vdash}\,E_3}\,E_1$$
$$\vdash S_1 \oplus S_2$$

E_1 : an additive disjonction.
$\Sigma_d E_{2d}$: a generalised additive conjonction ;
E_3: a generalised additive disjonction together a binary multiplicative conjonction ;

Logical decomposition of (1)

The set of designs that we build may be written as follows:

$$(\&_x(\downarrow\mathbb{L}(x) \multimap \oplus_y (\downarrow\mathbb{A}(y) \otimes \downarrow\mathbb{P}(x,y))))$$
$$\oplus$$
$$\oplus_y(\downarrow\mathbb{A}(y) \otimes \&_x(\downarrow\mathbb{L}(x) \multimap \downarrow\mathbb{P}(x,y))).$$

As a particular case, when $\mathbb{L}(x)$, $\mathbb{A}(y)$, and $\mathbb{P}(x,y)$, are behaviours, we retrieve the notion of "logical form" and their applications: vericondionnal semantics, quantifiers scopes ...

Nevertheless, by using interaction for formal semantics issues we may expect additionnal results:

- At first with the logical form, we have a more fine account of quantification.
  Indeed, as obtained by dealing with our example, the relevant logical connectives that we have to associate with the quantifiers are not firts order quantifiers but generalized additive conjonction or disjonction.

- Then, sets of designs are not necessary behaviours. An access to some dynamical aspects of meaning are then avalaible.
- At last, this seems very close of some approaches of semantics like the inferentialist ones.