FORMALIZING STATEMENTS, QUESTIONS, DIRECTIVES, AND EXCLAMATIONS

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DECEMBER 2015

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1. Introduction

The immediate and relevant precursor to the present paper is that paper entitled "From Newton's Laws of Motion to the Periodic Table of Semantic Predicates"[*]. Therein I essentially argued that if the postulate that the sets of Newtonian forces and semantic roles are equinumerous is espoused, then a semantic predicate is the direct consequence of one of the three Newtonian laws of motion. Using the eight canonical semantic predicates [B], [Z] ,[BR], [ZR] , [NA] , [TA], [CE], and [KE], I formalized a wide range of statements which originated from Quirk et al (1985: 740-754), Fromkin et al (2003: 192-3), Kroeger (2004:9-10), and Brown and Miller (1991:209). If it is noted that only statements are amenable to formalization, the question that poses itself is: How are questions, directives and exclamations to be formalized?

If we take the proposition

GIVE (FATUMA, ALI, A LAPTOP COMPUTER)

as an example, then [1]- [4] are realizations of the four generic illocutions, i.e. statement, question, directive, and exclamation.

[1] Fatuma gave Ali a laptop computer.

[2i] Did Fatuma give Ali a laptop computer?

[2ii] What did Fatuma give Ali?

[2iii] Who gave Ali a laptop computer?

[*] Accessible at www.luganda.com

[3] Give me a laptop computer.

[4i] How Fatuma gave Ali a laptop computer!

[4ii] What a nice laptop computer Fatuma gave Ali!

[4iii] What a nice laptop computer Ali received from Fatuma!

Prototypically, stating sentences, questioning sentences, directing sentences, and exclaiming sentences realize statements, questions, directives and exclamations respectively. However, sentence type embedding leads to atypical realization of generic illocutions as is shown in [5] – [20]. The embedding in question is precisely identified by using the following symbols:

<•> for a stating sentence

<?> for a questioning sentence

<—•> for a directing sentence

< ! > for an exclaiming sentence

[5] I noticed that he spoke English (…).<•<•>>CGEL*:15.4

[6] I can't imagine what they want (…).<•<?>> CGEL:15.5

[7] I think you'd better leave at once. <•<—•>> CGEL:11.3

[8] They didn't know what a crime he had committed. <•<!>> CGEL:15.7

[9] Who did she hope would be the winner? <?<•>> CGEL: 15.4

[10] Did I not tell you whether Kim would be coming? <?<?>>

* Reference to Quirk et al (1985)

[11] Why don't you take an aspirin? <?<–•>> CGEL: 11.3

[12] Do you realize what a great disaster it was? <?<!>>

[13] Be informed that Barack H Obama is not a Kenyan. <–•<•>>

[14] Tell me what you want. <–•<?>> CGEL:11.3

[15] Don't forget to lodge your application for the position. <–•<–•>>

[16] Realize how very tactful the diplomat is. <–•<!>>

[17] How strange it is that the children are so quiet! <!<•>> CGEL:15.4

[18] Isn't Christine clever! <!<?>> CGEL:11.2

[19] If only you would stop fidgeting with your mobile phone! <!<–•>>

[20] If only you realized what a great scientist Mme Curie was! <!<!>>

Before formalizing [1] – [4] and embeddings involving [1] –[4], I present an extended and revised edition of the situatodomainal role theory in Sec 2.

2. Extended Situatodomainal Role Theory

2.1. Variables

human (h)

concrete object (r)

situation (w)

generic illocution (λ)

- ❑ statement (σ)
- ❑ question (κ)
- ❑ directive (∂)
- ❑ exclamation (∈)

abstract object (y)

2.2. Domains

set/quantitative (q*)

degree (g*)

numerical (n*)

spatial (ℓ*)

temporal (t*)

material (m*)

biotic (a*)

plant (b*)

animal (z*)

[-VOLITIVE]		[+VOLITIVE]
perceptual (e*)	_____	observational (o*)
somatic (k*)	_____	psychophysical (v*)
cognitive (c*)	_____	ratiocinative (p*)
emotional (u*)	_____	axiological (j*)
dreaming (d*)	_____	imaginative (i*)
expressive (x*)	_____	communicative (s*)

2.3. Semantic Roles

change bearer [B]	nonchange bearer [Z]	reference [R]
dynamic causer [C]	nondynamic causer [K]	causee [E]

dynamic contactor [N] nondynamic contactor [T] contactee [A]

2.4. Semantic Predicates

absolute: [B] , [Z] ; generalized as [Σ]

relative : [BR] ,[ZR] ; generalized as [ΣR]

causative: [CE] , [KE] ; generalized as [ΦE]

contactive ; [NA] , [TA] ; generalized as [ΨA]

2.5. Brackets

round brackets ( ) enclosing a domain

square brackets [ ] enclosing a semantic role, predicate or formula

2.6. Illocutionary Operators

- stating operator

? questioning operator

−• directing operator

! exclaiming operator

2.7. Formation Rules

Letting χ, δ, and Ω represent a variable , domain , and operator respectively,

FR1 [χ (δ) Σ] is a well-formed situation.

FR2 [χ_1 (δ_1) ΣR χ_2 (δ_2)] is a well-formed situation.

FR 3 [χ_1 (δ_1) ΨA χ_2 (δ_2)] is a well-formed situation.

FR 4 [χ_1 (δ_1) ΦE χ_2 (δ_2)] is a well-formed situation.

FR 5 $\Omega\chi_1$ (δ) [χ (δ) Σ] is a well-formed generic illocution.

FR 6 $\Omega\chi_1$ (δ) [χ_1 (δ_1) Σ$R\chi_2$ (δ_2)] is a well-formed generic illocution.

FR 7 $\Omega\chi_1$ (δ) [χ_1 (δ_1) Σ Ψ$A\chi_2$ (δ_2)] is a well-formed generic illocution.

FR 8 $\Omega\chi_1$ (δ) [χ_1 (δ_1) Σ Ψ$A\chi_2$ (δ_2)] is a well-formed generic illocution.

FR 9 There are no well-formed situations and generic illocutions other than those expressed in FR 1-FR 8 above.

3. A Sample of Formalized Statements, Questions, Directives, and Exclamations

The proposition

GIVE (FATUMA, ALI, A LAPTOP COMPUTER)

is formalized as

$[h_1(v^*)CE\ [h_2(v^*)NA\ r(m^*)]]$.

We now formalize [1]- [4] (here below as [21]- [24] and embeddings related to them ([25]- [40])).

[21a] Fatuma gave Ali a laptop computer.<•>

[21b] • h_1 $(v^*)[h_1(v^*)CE[h_2(v^*)NA\ r(m^*)]]$

[22ia] Did Fatuma give Ali a laptop computer? <?>

[22ib] ?h_1 $(v^*)[h_1(v^*)CE[h_2(v^*)NA\ r(m^*)]]$

[22iia] What did Fatuma give Ali? <?>

[22iib] ?r $(m^*)[h_1(v^*)CE[h_2(v^*)NA\ r(m^*)]]$

[22iiia] Who gave Ali a laptop computer? <?>

[22iiib] ?h_1 $(v^*)[h_1(v^*)\ CE\ [h_2(v^*)NA\ r(m^*)]]$

[23a] Give me a laptop computer.<−•>

[23b] −• h_1 $(v^*)[h_1(v^*)CE[h_2(v^*)NA\ r(m^*)]]$

[24ia] How Fatuma gave Ali a laptop computer! <!>

[24ib] !$h_1(v^*)[h_1(v^*)CE[h_2(v)NA\ r(m^*)]]$

[24iia] What a nice laptop computer Fatuma gave Ali! <!>

[24iib] !$r(m^*)[h_1(v^*)CE[h_2(v^*)NA\ r(m^*)]]$

[24iiia] What a nice laptop computer Ali received from Fatuma! <!>

[24iiib] !$r(m^*)[h_1(v^*)CE[h_2(v^*)NA\ r(m^*)]]$

[25a] I remember that Fatuma gave Ali a laptop computer. <•<•>>

[25b] • h_{01} $(c^*)[h_{01}(c^*)TA[\bullet h_1\ (v^*)[h_1(v^*)CE[h_2(v^*)NA\ r(m^*)]]]]$

[26a] I wonder whether Fatuma gave Ali a laptop computer. <•<?>>

[26b] • h_{01} $(c^*)[h_{01}(c^*)TA[?h_1\ (v^*)[h_1(v^*)CE[h_2(v^*)NA\ r(m^*)]]]]$

[27a] I want you to give me a laptop computer. <•<−•>>

[27b] • h_{01} (j*)[h_{01}(j*)TA[−•h_{02} (v*)[h_{02}(v*)CE[h_{01}(v*)NA r(m*)]]]]

[28a] I wonder how Fatuma gave Ali a laptop computer. <•<!>>

[28b] • h_{01} (u*)[h_{01}(u*)TA[!h_1 (v*)[h_1(v*)CE[h_2(v*)NA r(m*)]]]]

[29a] Do you know that Fatuma gave Ali a laptop computer? <?<•>>

[29b] ? h_{02} (c*)[h_{02}(c*)TA[•h_1 (v*)[h_1(v*)CE[h_2(v*)NA r(m*)]]]]

[30a] Do you know whether Fatuma gave Ali a laptop computer? <?<?>>

[30b] ? h_{02} (c*)[h_{02}(c*)TA[?h_1 (v*)[h_1(v*)CE[h_2(v*)NA r(m*)]]]]

[31a] Do you remember to give me a laptop computer? <?<−•>>

[31b] ? h_{02} (c*)[h_{02}(c*)TA[−•h_{01} (v*)[h_{02}(v*)CE[h_{01}(v*)NA r(m*)]]]]

[32a] Do you realize how Fatuma gave Ali a laptop computer? <?<!>>

[32b] ? h_{02} (c*)[h_{02}(c*)NA[!h_1 (v*)[h_1(v*)CE[h_2(v*)NA r(m*)]]]]

[33a] Remember that Fatuma gave Ali a laptop computer. <−•<•>>

[33b] −• h_{02} (c*)[h_{02}(c*)TA[•h_1 (v*)[h_1(v*)CE[h_2(v*)NA r(m*)]]]]

[34a] Remember whether Fatuma gave Ali a laptop computer. <−•<?>>

[34b] −• h_{02} (c*)[h_{02}(c*)NA[?h_1 (v*)[h_1(v*)CE[h_2(v*)NA r(m*)]]]]

[35a] Remember to give me a laptop computer <−•<−•>>

[35b] −• h_{02} (c*)[h_{02}(c*)NA[−•h_{02} (c*)[h_{02}(c*)CE[h_{01}(v*)NA r(m*)]]]]

[36a] Remember how Fatuma gave Ali a laptop computer. <−•<!>>

[36b] −• h_{02} (c*)[h_{02}(c*)NA[!h_1 (v*)[h_1(v*)CE[h_2(v*)NA r(m*)]]]]

[37a] If only I knew that Fatuma gave Ali a laptop computer! <!<•>>

[37b] !h_{01} (c*)[h_{01}(c*)TA[•h_1 (v*)[h_1(v*)CE[h_2(v*)NA r(m*)]]]]

[38a] If only I knew whether Fatuma gave Ali a laptop computer! <!<?>>

[38b] !h_{01} (c*)[h_{01}(c*)TA[?h_1 (v*)[h_1(v*)CE[h_2(v*)NA r(m*)]]]]

[39a] If only I insisted that Fatuma give Ali a laptop computer! <!<−•>>

[39b] !h_{01} (j*)[h_{01}(j*)NA[−•h_1 (v*)[h_1(v*)CE[h_2(v*)NA r(m*)]]]]

[40a] If only I remember how Fatuma gave Ali a laptop computer! <!<!>>

[40b] !h_{01} (c*)[h_{01}(c*)NA[!h_1 (v*)[h_1(v*)CE[h_2(v*)NA r(m*)]]]]

That both [24iia] and [24iiia] are formalized as

!r(m*)[h_1(v*)CE[h_2(v*)NA r(m*)]]

motivates us to discuss paraphrasing and thematization as parallel processes in sentence construction. Although there is a manifest subject exchange involving the verbs GIVE and RECEIVE, the theme is in both cases

WHAT A NICE LAPTOP COMPUTER.

[24iiia] results from the decanonization of [24iia]. Let us highlight paraphrasing and thematization in [41] and [42].

[41ia] **Lung cancer** kills many smokers. (THEMATIZATION OF THE LOGICAL THEMATIC GRAMMATICAL SUBJECT)

[41iia] **Lung cancer,** many smokers die of it. (LEFT DISLOCATION)

[41iiia] **It is lung cancer** that kills many smokers. (CLEFTING)

[42ia] **Many smokers** are killed by lung cancer. (PASSIVIZATION)

[42iia] **Many smokers** die of lung cancer. (NONCANONICAL FORM)

[42iiia] **Many smokers,** lung cancer kills. (FRONTING)

[41ib] • y(a*)[y(a*)CE[h(a*)B]]

[41iib] • y(a*)[y(a*)CE[h(a*)B]]

[41iiib] • y(a*)[y(a*)CE[h(a*)B]]

[42ib] • h(a*)[y(a*)CE[h(a*)B]]

[42iib] • h(a*)[y(a*)CE[h(a*)B]]

[42iiib] • h(a*)[y(a*)CE[h(a*)B]]

By virtue of the predicates KILL and DIE OF the propositions KILLS (LUNG CANCER, MANY SMOKERS) and DIE OF (MANY SMOKERS, LUNG CANCER) are semantically identical despite the different ways of information packaging.

4. Outlook

If the extended situatodomainal role theory presented in this short paper is fully developed, the outlook for computational linguists seems to be rewarding.

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