A SEMANTIC SITUATION –ROLE THEORY[*]

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In order to state the problem to be tackled in this paper, I propose to make contact with four texts on English Language and linguistics. The intended contact pertains to their treatment of role theory.

In their influential grammar of the English language Quirk et al (1985: 741) duly remind us that

> analysis of participant roles has not achieved a general consensus, nor has it fully explored all distinctions … [their] description must therefore be considered tentative.

On the other hand, Brown and Miller (1991: 308) justify their description of role theory by "its offering a degree of both generality and particularity [although] it has no easily defended validity … [and] there seems to be no alternative in the current state of knowledge."

While Fromkin et al (2003: 192) prefix their list of roles with a reassurance to the effect that "the list is not complete", Larson and Segal's (1995: 489) considered stance on the nature and number of semantic roles is the most pessimistic, for they write:

> The upshot is that we regard the question of which thematic roles there are and how they are defined as empirical ones, to be resolved in the usual way: by investigations that construct specific theories making detailed and specific predictions. Preliminary theories of this kind have been proposed;

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[*] This paper completely supersedes the papers entitled "The Semanticosyntactic Bridge", versions I & II: version I having been posted on this website on 8th July 2008

however, it is likely that resolving thematic roles precisely will require a great deal of investigation, involving domains beyond linguistics. It is worth remembering that fully 22 centuries elapsed between the first suggestion of the atomic theory of matter, in which all substances were factored into earth, water, air, and fire, and the elaboration of atomic theory by John Dalton, in which a more complete and satisfactory set of atomic constituents was proposed. Finding elementary constituents can evidently be a long-term project.

Admittedly, the development of atomic theory was tortuous; but we need not resign ourselves to a similar state-of-affairs with regard to role theory. The objective I am poised to pursue in this paper is to bring the problem of determination of semantic roles closer to its solution by enunciating a semantic situation-role theory.

First, I posit thirteen entities: propositions (p), spaces (l), sets (g), numbers (n), times (t), pieces of matter (m), material objects (r), plants (b), animals (z), humans (h), movers (k), cognizers (c) , and feelers (e). There are thirteen situation types correlated with the entity types: p′, l′ g′, n′, t′, m′, r′, b′, z′, h′, k′, c′, and e′. The thirteen situation types, in turn, give rise to thirteen situation manifestations; p′′, l′′, g′′, n′′, t′′, m′′, r′′, b′′, z′′, h′′, k′′, c′′, and e′′.

Second, I posit twenty-two semantic role types: reference (R), direction (D), comitant (J), source (S), mediate (M), goal (G), part (P), container (K), affected (A), result (N), nonchange bearer (Z), change bearer (B), perceived (O), causer (C), effect (E), possessor (H), former (F), emitter (X), intaker (I), affector (T), liker (L), and disliker (U).

Third, if **θ** and **τ** stand for semantic role and entity (, situation, or situation manifestation) respectively, three formation rules suggest themselves:

Formation Rule 1: $\theta_1\tau_1\ \theta_2\tau_2$

Formation Rule 2: $\theta_1\tau_1[\theta_2\tau_2\ \ \theta_3\tau_3]$

Formation Rule 3: $\theta[\theta_1\tau_1\ \ \theta_2\tau_2]\ \theta_3\ \tau_3$

With the formal language of situation –role theory in place, I now analyse and formalize 66 sentences taken from Quirk et al (1985: 754) (sentences (1)- (39)), Brown and Miller (1991:309) (sentences (40)- (57)) and Fromkin et al (2003: 192-3) (sentences (58)- (66).

(1)   She is happy.   ZhKe'

(2)   He turned traitor.   BhKh'

(3)   The Sahara is hot.   ZlKm'

(4)   Last night was warm.   ZtKm'

(5)   The show was interesting.   Zh''Ke'

(6)   It is windy.   Zm''Km'

(7)   He was at school.   ZhRl

(8)   She got into the car.   BhKr

(9)   He is lying on the floor.   ZhRl

(10)   The meeting is at eight.   Zh′′Rt

(11)   He was working.   ChEϵ′

(12)   She is standing.   ZhKh′

(13)   The curtains disappeared.   BrSl

(14)   The wind is blowing.   Bm′′Km′

(15)   It is raining.   Bm′′Km′

(16)   He threw the ball.   ChE[BrKm′]

(17)   Lightning struck the house.   Tm′′Ar

(18)   He is holding a knife.   ChE[ZrRh]

(19)   The stone broke the window.   C r_1E[Br_2Km′]

(20)   She has a car.   HhAr

(21)   We paid the bus driver.   Ch_1 E[Bh G[Hh_2 Ae′′]]

i.e.   We paid (money) to the bus driver.

(22)   The will benefits us all.   Oh′′Lh

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(23)	They climbed the mountain.	BhRl
(24)	The bus seats thirty.	Zn(h)Kr
(25)	They fought a clean fight.	Z[FhNk″]Ke′
(26)	I wrote a letter.	Fk(h)Nr(c″)
(27)	They had an argument.	FhNe″
(28)	He nodded his head.	ChE[B[ZrPh]Rl]
(29)	He declared her the winner.	Xh_1 A[Zh_2 Kh′]
(30)	The sun turned it yellow.	Cr_1 E[Br_2 Km′]
(31)	The revolver made him afraid.	CrE[BhKe′]
(32)	I found it strange.	O[ZrKe′]Ah
(33)	He placed it on the shelf.	ChE[BrGl]
(34)	The storm drove the ship ashore.	Cm″E[BrGl]
(35)	A car knocked it.	Tr_1 Ar_2
(36)	I prefer them on toast.	O[Zr_1 Rr_2]Lh
(37)	I bought her a gift.	Ch_1 E[Br R [H h_2 Ar]]

(38)   She gave the door a kick.   ChE [Tk″(h) Ar]

(39)   She knitted me a sweater.   B[Fh$_1$ Nr]Rh$_2$

(40)   She was singing.   FhNh″

(41)   The string broke.   BrKr′]

(42)   John sharpened the knife.   ChE[Br Kr′

(43)   The dog is digging a hole.   Fz Nl

(44)   Harold ran a mile.   Bh Ml

(45)   Susan went to Denmark.   Bh Gl

(46)   Yasuko is arriving from Kyoto.   Bh Sl

(47)   Helen traveled via Samarkand.   Bh Ml

(48)   She gave the book to Bill.   Ch$_1$ E[Br G[Hh$_2$ Ar]]

(49)   I got the cassette from David.   B[Bh$_1$ G[Hh$_1$ Ar]]Sh$_2$

(50)   I contacted Jane via her sister.   Z[Th$_1$ Ah$_2$]Mh$_3$

(51)   The painting cost £5,000.   Zr Me″

(52) Miranda knew all the answers.   Zc″ Kc

(53) Harriet owns a cat.   Hh Az

(54) Celia is cold/sad.   ZhKe′

(55) The child is sleeping.   ZhKk

(56) The town is dirty,   ZlKm′

(57) Fiona is the convener.   ZhKh′

(58) Joyce ran.   BhKk′

(59) Mary found the puppy.   AhOz

(60) It rains is Spain.   B[Bm″Km′]Kl

(61) He put the cat on the porch.   ChE[BzRl]

(62) He flew from Iowa to Idaho.   B[BhSl$_1$]Gl$_2$

(63) Jo cuts hair with a razor.   ChE[Cr$_1$E[Br$_2$Kr′]]

(64) Helen heard Robert playing the piano.   Ah$_1$ O[Th$_2$ Ar]

(65) The wind damaged the roof.   Cm″E[Br Kr′]

(66)   The tail of the dog wagged furiously.

i.e.   The tail of the dog wagged in a furious way. $B[Zr''K[ZrPz]]Me'$

Semantic equations are possible. Consider (67) –(70).

(67a) h_1 kissed h_2 $Th_1 Ah_2$

(67b) $Th_1 Ah_2$ $\longrightarrow$ $Zh'_1 K[Th_1 Ah_2] + Zh''_2 K[Th_1 Ah_2]$

(68a) r is part of z $ZrPz$

(68b) $ZrpZ$ $\longrightarrow$ $Zr''K[ZrPz] + Zz''K[ZrPz]$ cf (66)

(69a) h_1 pays r to h_2 $Ch_1 E[BrG[[Hh_2 Ar]]$

(69b) $Ch_1 E[BrG[Hh_2 Ar]] \longrightarrow Zh''_1 K[Ch_1 E[BrG[Hh_2 Ar]]]$

$+ Zr''K[Ch_1 E[BrG[Hh_2 Ar]]]$

$+ Zh''_2 K[Ch_1 E[BrG[Hh_2 Ar]]]$

(70a) h bakes r in l. $\longrightarrow$ $Z[Fh Nr] Kl$

(70b) $Z[Fh Nr]Kl$ $Zh''K[Z[Fh Nr]Kl] + Zr''K[Z[Fh Nr]Kl]$

$+ Zl''K[Z[Fh Nr]Kl]$

It is clear that semantic compounds like **kisser, payer, payment, payee, baker**, and **bakery** are formalizable as:

$Zh''_1 K[Th_1 Ah_2]$

$Zh''_1 K[Ch_1 E[BrG[Hh_2 Ar]]]$

$Zr''K[Ch_1 E[BrG[Hh_2 Ar]]]$

$$Zh''_2[Ch_1\ E[BrG[Hh_2\ Ar]]]$$
$$Zh''K[Z[Fh\ Nr]Kl]$$
$$Zl''K[Z[Fh\ Nr]\ Kl]$$

respectively.

The semantic roles of possessor H, former (F), emitter (X) and intaker (I) are included in the role inventory for analytical convenience but are eliminable as in (71) – (74).

(71) $[Hh\ A\tau]$ $\equiv$ $ChE[ZhJ\tau]$

(72) $[Fh\ N\tau]$ $\equiv$ $ChE[B\tau_0\ N\tau]$

(73) $[Xh\ A\tau]$ $\equiv$ $ChE[B\tau\ Sh]$

(74) $[Ih\ A\tau]$ $\equiv$ $ChE[B\tau\ Kh]$

To conclude, what purports to constitute a solution to the problem of determining roles resides in the evidenced formalizing superiority of the new formal logical language which incorporates roles as predicates and ontological categories as object variables.

References

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