

LEXICAL TAXONOMY

By Dr. K.B. Kiingi

This paper purports to lay a firmly principled method of taxonomizing the lexicon of any given human language. It will be recalled that earlier attempts by writers like Roget (1852), Dornseiff (1934), Hallig and Von Wartburg (1952), Wehrle and Eggers (1961) and McArthur (1981) have all provoked a hail of critical discussions as manifested in Ballmer and Brennenstuhl (1986:112-126) and Jackson (1988:216-222). The overall verdict of the discussants is that the taxonomies are pseudo-taxonomies since they do not exhibit a lucid hierarchical structure that is an indispensable feature of a scientific taxonomy. The lexical taxonomy I undertake to enunciate in this paper is formally analogous to but more productive than the biological one. First of all I intend to present a situation-role theory which happens to bear a very close affinity to versions of semantic participant role theory such as those treated in Quirk et al (1985) and Brown and Miller (1991).

To a physicist "change of state" is the change from one to another of the three states of matter, i.e. gaseous, liquid or solid state, Whenever we use language, we also talk about states and changes of state but of anything such as quantity, number, space, time, force, heat and electric charge. Let a state or change of state be formalizable as in (1).

$$(1) \quad \check{S} [\theta_1 \varepsilon_1 + \theta_2 \varepsilon_2]$$

\check{S} is a situation predicate, θ_1 and θ_2 are semantic roles of the thought categories ε_1 and ε_2 respectively. As thought categories I posit: state q, change of state c, quantity u, number n, space l, time t, matter m, material object r, biotic matter b, plant f, animal z, human h, electric

charge e, mechanical force k, sound s, heat w, light o, and abstract product i.

As roles I propose: general situation bearer Q, volition-bound situation bearer E, holonym W, hypernym V. reference O, source X, direction D, medium P, measure M, comitative T, goal G, opposition N, equality U, augmentative S, diminutive L, general contactor A, perceptive contactor R, intracorporal contactor I. psychomotor contactor B, cognitive contactor K, attitudinal (or emotional) contactor F, contacted H, causer C, volition-bound causer Z, and effected Y.

Using contact, causation and volition as classificatory criteria, the participant roles can be tabulated as follows.

	ZERO- VOLITION	VOLITION- BOUND	
ZERO-CONTACT	Q	E	W,V,O,X,D,P, M,T,G,N,U,S,L
CONTACT	A	B	
	R	K	H
	I	F	
CAUSATION	C	Z	Y

In the situation formula (1), θ_1 can assume the values Q, E, A, R, I, B, K, F, C, and Z, θ_2 while can range over W, V, O, X, D, P, M, T, G, N, U, S, L, H, and Y.

With (2) – (19) taken from Brown and Miller (1991:309) and (20) - (58) from Quirk et al (1985:754) ample exemplification of the situation – role theory follows.

- (2) She was singing. $\check{S}[Zh + \check{S}[Qs + Xh]]$
- (3) The string broke. $\check{S}[Qr + Gq]$
- (4) John sharpened the knife. $\check{S}[Zh + \check{S}[Qr + Gq]]$
- (5) The dog is digging a hole. $\check{S}[Zz + Yl]$
- (6) Harold ran a mile. $\check{S}[Eh + Mi]$
- (7) Susan went to Denmark. $\check{S}[Eh + Gl]$
- (8) Yasuko is arriving from Kyoto. $\check{S}[Eh + Xl]$
- (9) Helen traveled via Samarkand. $\check{S}[Eh + Pl]$
- (10) She gave the book to Bill. $\check{S}_2[Zh_2 + \check{S}_1[Bh_1 + Hr]]$
- (11) I got the cassette from David. $\check{S}[[Bh_2 + Hr] + Xh_1]$
- (12) I contacted Jane via her sister. $\check{S}[[Bh_1 + Hh_2] + Ph_3]$
- (13) The painting costs \$ 5000. $\check{S}[Qr + Mi]$

- (14) Miranda knew all the answers. Š[Kh + Hi]
- (15) Harriet owns a cat. Š[Bh + Hz]
- (16) Celia is cold /sad. Š[Ih + Hq] / Š[Fh + Hq]
- (17) The child is sleeping. Š[Ah + Hq]
- (18) The town is dirty. Š[Al + Hq]
- (19) Fiona is the convener. Š[Bh + Hc]
- (20) She's happy. Š[Fh + Hq]
- (21) He turned traitor. Š[Eh + Gq]
- (22) The Sahara is hot. Š[Al + Hq]
- (23) Last night was warm. Š[At + Hq]
- (24) The show was interesting. Š[Ac + Hq]
- (25) It's windy. Š[Ai + Hq]
- (26) He was at school. Š[Eh + Oi]

- (27) She got into the car. Š[Eh + Gl]
- (28) He is lying on the floor Š[Bh + Hl]
- (29) The meeting is at eight. Š[Qc + Ot]
- (30) He was working. Š[Bh + Hc]
- (31) She is standing. Š[Eh + Oq]
- (32) The curtains disappeared. Š[Qr + Xl]
- (33) The wind is blowing. Š[Ai + Hc]
- (34) It's raining. Š[Ai + Hc]
- (35) He threw the ball. Š[Bh + Hr]
- (36) Lightning struck the house. Š[Ai + Hl]
- (37) He is holding a knife. Š[Bh + Hr]
- (38) The stone broke the window. Š[Cr + Š₁[Qr₁ + Gq]]
- (39) She has a car. Š[Bh + Hr]

- (40) We paid the bus driver. $\check{S}_2[\text{Zh}_2 + \check{S}_1[\text{Bh}_1 + \text{H}\epsilon]]$
- (41) The will benefits us all. $\check{S}[\text{Fh} + \text{Hi}]$
- (42) They climbed the mountain. $\check{S}[\text{Bh} + \text{Hi}]$
- (43) The bus seats thirty. $\check{S}[\text{Bh} + \text{Hr}] / \check{S}[\text{Ar} + \text{Hq}]$
- (44) They fought a clean fight. $\check{S}[\text{Eh} + \text{Pi}]$
- (45) I wrote a letter. $\check{S}[\text{Zh} + \text{Yi}] / \check{S}[\text{Zh} + \text{Yr}]$
- (46) They had an argument. $\check{S}[\text{Kh} + \text{Hi}]$
- (47) He nodded his head. $\check{S}[\text{Bh} + \text{Hr}]$
- (48) He declared her the winner. $\check{S}_2[\text{Zh}_2 + \check{S}_1[\text{Bh}_1 + \text{Hq}]]$
- (49) The sun turned it yellow. $\check{S}_2[\text{Cr}_2 + \check{S}_1[\text{Qr}_1 + \text{Gq}]]$
- (50) The revolver made him afraid. $\check{S}_2[\text{Cr} + \check{S}_1[\text{Fh} + \text{Hq}]]$
- (51) I found it strange. $\check{S}_2[\text{Kh} + \check{S}_1[\text{Ai} + \text{Hq}]]$
- (52) He placed it on the shelf. $\check{S}_2[\text{Zh} + \check{S}_1[\text{Ar} + \text{Hi}]]$

- (53) The storm drove the ship ashore. $\check{S}_2[Ci + \check{S}_1[Qr_1 + GI]]$
- (54) A car knocked it down. $\check{S}_2[Cr_2 + \check{S}_1[Qr_1 + GI]]$
- (55) I prefer them on toast. $\check{S}_2[Fh + \check{S}_1 [Ar_2 + Hr_1]]$
- (56) I bought her a gift. $\check{S}[[Bh_1 + Hr] + Oh_2]$
- (57) She gave the door a kick. $\check{S}_2[Zh + \check{S}_1[Ar + Hc]]$
- (58) She knitted me a sweater. $\check{S} [Zh_1 + Yr] + Oh_2]$

In order to formulate the lexical taxonomy I am seeking, I propose to group the participant roles as in (59).

- (59a) θ_z = Q, E (zero- contactors)
- (59b) θ_b = W, V, O, X, D, P, M, T, N, U, S, L (basic roles)
- (59c) θ_k = A, R, I, B, K, F (contactors)
- (59d) θ_c = C, Z, (causers)

If we consider the formalization in (5) and (45), we note that what they have in common is that they both exhibit the role constellation ZY. Furthermore, let us analyze the formalization in (60a).

- (60a) John opened the door with the key.

$$\check{S}_3[\text{Zh} + \check{S}_2[\text{Cr}_2 + \check{S}_1[\text{Qr}_1 + \text{Gq}]]]$$

We easily note that (60a) breaks down in (60b) and (60c).

$$(60b) \quad \text{The key opened the door.} \quad \check{S}_2[\text{Cr}_2 + \check{S}_1[\text{Qr}_1 + \text{Gq}]]$$

$$(60c) \quad \text{The door opened.} \quad \check{S}_1[\text{Qr}_1 + \text{Gq}]$$

Clearly, (60a) – (60c) manifest the role constellations ZCQG, CQG, and QG respectively.

We can now generalize the role constellation types with componential definitions in (61).

$$(61a) \quad \theta_z \theta_b \quad =df \quad [- \text{CONTACT}]$$

$$(61b) \quad \theta_k H \quad =df \quad [+ \text{CONTACT}]$$

$$(61c) \quad \theta_c Y \quad =df \quad [+ \text{CAUSATION}]$$

$$(61d) \quad \theta_c \theta_z \theta_b \quad =df \quad [+ \text{CAUSATION} - \text{CONTACT}]$$

$$(61e) \quad \theta_c \theta_k H \quad =df \quad [+ \text{CAUSATION} + \text{CONTACT}]$$

$$(61f) \quad \theta_c \theta_c Y \quad =df \quad [+ \text{CAUSATION} + \text{CAUSATION}]$$

$$(61g) \quad \theta_c \theta_c \theta_z \theta_b \quad =df \quad [+ \text{CAUSATION} + \text{CAUSATION} - \text{CONTACT}]$$

$$(61h) \quad \theta_c \theta_c \theta_k H \quad =df \quad [+ \text{CAUSATION} + \text{CAUSATION} + \text{CONTACT}]$$

(61i) $\theta_c\theta_c\theta_cY$ =df[+CAUSATION+CAUSATION+CAUSATION]

Admittedly, we are confining ourselves to the nuclear valency of the situation predicates. Consequently, (56) is assignable to the role constellation Q_kH .

By inverting (61), we arrive at the lexical taxonomy we have been yearning for.

(62)	$\theta_c\theta_c\theta_cY$:	Hyperkingdom
	$\theta_c\theta_c\theta_kH$:	Superkingdom
	$\theta_c\theta_c\theta_z\theta_b$:	Kingdom
	$\theta_c\theta_cY$:	Phylum
	$\theta_c\theta_kH$:	Class
	$\theta_c\theta_z\theta_b$:	Order
	θ_cY	:	Family
	θ_kH	:	Genus
	$\theta_z\theta_b$:	Species

The above taxonomy can, it is claimed, be employed to write a general –purpose dictionary in which lemmata are arranged conceptually. In fact, it could also lead to the compilation of an alphaconceptual one, which would be arranged both alphabetically and conceptually.

Mr. Deo Kawalya, an MA student at the Institute of Languages Makerere University, is testing out the taxonomy on the Luganda lexicon.

REFERENCES

Ballmer, T. and W. Brennenstuhl. (1986) *Deutsche Verben. Eine Sprachanalytische Untersuchung des Deutschen Verbwortschatzes*. Tuebingen: Gunter Narr Verlag

Brown, K. and J. Miller (1991) *Syntax: A Linguistic Introduction to Sentence Structure*. London and New York: Routledge

Dornseiff, F. (1934) *Der Deutsche Wortschatz nach Sachgruppen*. De Gruyter, Berlin, 1965

Hallig, R., von Wartburg, W. (1952): *Begriffssystem als Grundlage fuer die Lexikographie*. Akademie Verlag, Berlin, 1993

Jackson, Howard (1995) *Words and Their Meaning*. London and New York: Longman

Quirk, R, S. Greenbaum, G. Leech, and J. Svartvik (1985) *A Comprehensive Grammar of the English Language*. London: Longman

McArthur, Tom (1981) *Longman Lexicon of Contemporary English*.
London: Longman

Roget, P.M. (1852) *Roget's Thesaurus*. London: Longman. 1966

Wehrle, H., Eggers, H.(1961): *Deutscher Wortschatz*. Stuttgart: Klett.