Working Papers of the Department of Ecocommunication

NR 1

Adam Mickiewicz University
Faculty of Modern Languages and Literature
Department of Ecocommunication

Poznań

OIKEIOS LOGOS

Working Papers of the Department of Ecocommunication

Nr 1

An outline of a domain-resource-agent-access-management (DRAAM) model of human communication: towards an ecology of human communication

Stanisław Puppel

Katedra Ekokomunikacji UAM

.....

Please, cite as: Puppel, S. 2004. "An outline of a domain-resource-agent-access-management (DRAAM) model of human communication: towards an ecology of human communication". Poznań: Adam Mickiewicz University, Department of Ecocommunication. Electronic journal **Oikeios Logos** 1.

.....

I. Introduction

One may look at human language and communication in terms of the overall cognitive-communicative potential that is contained in the collectivity of all the human individuals (referred to here as the population of 'human communicating agents', or, simply 'agents') and who constitute the communication environment (also referred to here as the 'universal communication space', or, simply 'environment'). The 'agent-environment' framework within which language and human communication are approached in the present paper

properly highlights the role that is played in communication by an individual human agent, on the one hand, and by the environment to which all the human agents most naturally belong

and which exerts all kinds of pressure on them, on the other. The view expressed here firmly counterbalances the position expressed by a more traditional view of human communication which approaches it solely in terms of the overwhelming predominance of language functionalism, or, more properly, in terms of the structure and functions of spoken and written language resources. In this way, the paper contributes to a currently developing trend in linguistics which emphasizes the dependence of human communication, *ceteris paribus*, on a plethora of environmental (ecological) factors, on the one hand, and on the human agent's management of the various communication resources, on the other. In this way, the paper is also an attempt to propose a proper balance between communication and the environment as forming a dynamic framework of interdependencies. The paper in section II has been written in the form of basic (numbered) assumptions.

II. The basic assumptions

The following basic assumptions have been made:

a. **Living agents and communication**

1. The Earth is inhabited by living organisms (also referred to as 'living agents').
2. All living agents may be defined as those who inhabit the **Universal Biological Space** (UBS) and which participate in the **Universal Communication Space** (UCS) defined, in turn, as the ultimate framework for encompassing all the populations of agents and for dealing with the agents' potential/ability to communicate. Within the UCS framework, all living agents are understood as 'being in the world' via their potential for getting involved in communication.
3. All living agents may be additionally defined as those who participate in the **Universal Communication Enterprise** (UCE), properly contained within the UCS, and whose most pervading properties are their **interrelatedness** (Ir) and **interactedness** (Ia). This means that all living agents are interrelated in that they participate in **communication systems** (CS) within which they are able to interact communicatively. Within the UCE sub-framework, communication is a permanent and dynamic task for all the agents who constitute the UCS.

4. All living agents comprise the following general types: human agents and non-human agents.

5. All human agents are further defined as those who, apart from participating in the UCS, also participate in the **Universal Social-Cultural Space** (USCS) and who demonstrate the **Human Communication Potential** (HCP), whereas all non-humans agents are defined as those which demonstrate the **non-Human Communication Potential** (nHCP) in the sense that the two kinds of potentials, HCP and nHCP, developed phylogenetically in the respective genera, may be defined as representing the species-specific limits of both **cognition** and **communication** within the respective genera.

6. Communication is properly contained within what may generally be referred to as **communicative behaviour dynamics** (CBD), that is, it is activated and unfolded in **communication acts** (CAs) performed by both groups of agents in the **communication process** (CP) as a result of and within **communicative encounters** (CEn). In other words, within the HCP sub-framework, communication is concretized in discrete communication tasks meant as the agents' individualized solutions performed via individualized CAs, in the CP and within a given CEn such that a given communicating agent may and does function as both a receiver and sender of messages, as has been envisaged by the classical model of communication (cf. Weaver and Shannon, 1949; Cherry, 1957) .

7. The above mentioned groups of agents may be referred to as '**human communicating agents**' (HCA; also referred to as 'agents') and '**non-human communicating agents**' (nHCA), as they are properly contained within and constrained by the HCP and nHCP, respectively. Both groups of agents are organized into populations of agents whose communication potentials differ non-monotonically (cf. Puppel, 2002).

8. A special group of communicating agents, referred to as '**artificial agents**' (AA), that is, non-living non-human agents (e.g. computers), may be defined as those agents who may participate in the CP whereby they are generally preprogrammed to be sensitive to the human CBD in a strictly controlled way and which may participate in the CP within the dyad HCA-AA.

b. **Communication domains, communication resources and operational fitness**

9. HCP is defined as a dynamic and complex phenomenon which is determined by the presence of the HCAs (the 'who' of the CP), immersed in the **communication domains** (CD, or the 'where' of the CP), and managing the **communication resources** (CR, or the 'what' of

the CP), and the **operational fitness** (OF, or the 'how' of the CP). The HCP may be expressed by means of the Law of HCP which may be formulated as follows:

$$HCP = HCA + (CD + CR + OF)$$

and which reads as follows: the human communication potential is the sum total of all the human communicating agents and the combined effect communication domains, communication resources and the agents' individualized operational fitness.

The Law of HCP has the following two extensions:

(a) the higher is the combined effect of the CD + CR + OF complex, the higher is the HCP of an individual HCA, and

(b) the lower is the combined effect of the CD + CR + OF complex, the lower is the HCP of an individual HCA.

10. The communication domains are defined as a set of determinants (i.e. characteristics) of the HCP.

11. The CDs comprise the following:

(a) the founding (core) **biological domain** which comprises all the living human organisms as elements of the UBS. Within this domain, the HCA may be defined by the following formula*:*

the human body is a natural biological site of communication,

(b) the derived human species-specific **social-cultural domain** which comprises all human agents as elements of the USCS. Within this domain, the HCA may be defined by the following formula: every HCA communicates within the social-cultural framework.

12. The derived human species-specific **operational fitness** is defined by such parameters as 'effectiveness', 'successfulness' and 'comfortability'. Within this dimention, the HCA may be defined by the following formula: every HCA demonstrates variable individual parameters of the agent's operational fitness depending both on the type of CEn (context) and individual preferences (practice).

13. The communication resources are defined as repositories over which human agents exert smaller or greater control and which must be activated in the communication process if the process is to ensue and run its course.

14. The CRs comprise the following:

(a) the 'crown' **language and speech resources** (LaSR), i.e. those resources which comprise the agent's knowledge of language structure and functions (rules and representations), as well as the knowledge of those resources which comprise the so-called 'speech physiology', that

is, time, the space of the speech production mechanism, muscular movements, and audition, used synergistically in the external manifestations of language, i.e. in speech, through the highly specialized activation and utilization of the vocal-auditory modality, or either in writing or in 'sign language' through the highly specialized activation and utilization of the tactile and visual modalities. The two kinds of resources constitute the HCA's **linguistic communicative competence** (LCCom), and

(b) the 'supporting' **non-language resources** (nLR), i.e. the agents' non-linguistic competence comprising the agent's control of the structure and functions of both all of paralanguage resources and all of the human non-verbal communication resources, that may be used either through the synergistic activation of the vocal-auditory and visual modalities or the exclusive activation and implementation of any of the modalities mentioned above (that is, of the vocal-auditory modality for the paralanguage resources and the visual and tactile modalities for the non-verbal communication resources). The two kinds of resources constitute the HCA's **non-linguistic communicative competence** (nLCCom).

15. The HCP is realized in the USCS (which may also be referred to more narrowly as 'the linguistic community'); that is, the universal space of the entire cross-generational population of all living HCAs which forms natural language-based groups of 'communicators' such that there occur various criss-crossing **human communication networks** (HCN) within the limits of one natural language or across various natural languages which every normal and healthy HCA necessarily enters while interacting with other HCAs.

16. The domains and resources participate in the communication process between and among the interrelated and interacting human agents who are naturally immersed in the universal social-cultural space (USCS), such that:

(a) all human agents are interrelated within the CDs while forming and participating in HCNs as communicating entities, and

(b) all human agents interact communicatively through their management of the CRs.

c. **Communication resource management versus communicative goals**

17. All HCAs activate and employ the CRs in language use and non-language use.

18. Proper **language use** by a particular HCA (LU; also referred to as 'language behaviour') requires the presence of LCCom which is understood as its control.

19. Control of LU is defined as:

(a) ‘access’ to the language and speech resources (LaSR) determined by and interrelated within the CDs, and

(b) their ‘management’ by a HCA in the individual CAs in the sense defined in (21) below.

20. Proper **non-language use** by a particular human agent (nLU; also referred to as ‘non-language behaviour’) requires the presence of nLCCom which is understood as its control.

21. Control of nLU is defined as:

(a) ‘access’ to the non-language resources (nLR) determined by and interrelated within the CDs, and

(b) their ‘management’ by a HCA in the individual CAs in the sense defined in (22) below.

22. Access to and management of the CRs are defined as follows:

(a) **access to the CRs** (CRA) within the HCP is the ability of an individual HCA to activate a given resource (or, more properly, a set of resources) in order to undertake management proper in the CP, and

(b) **management of the CRs** (CRM) within the HCP is the ability of an individual HCA to administer the resources in such a way as to attain a preset **communicative goal** (CG) or a set of goals during the CP within the available operational fitness. Management of the CRs specifically involves the following activities: planning, allocating, coordinating, activating and monitoring the CRs.

23. It should be remembered that CGs are to be properly distinguished from other short-term and long-term goals that an individual HCA as a biological entity (i.e. an element of the UBS) and social-cultural entity (i.e. a member of the human society) is capable of defining and realizing by means of other resources with which s/he operates in the sense of demonstrating the ability to access and manage them.

d. **Communicative competence and variability in language use and non-language use**

24. All human communicating agents vary as to the ways in which they demonstrate their LU and nLU as defined in (17)-(23) above.

25. In their varied LU and nLU, the HCAs are additionally determined by a set of **conditions** (Con) which comprise the following:

(a) the communicative propensities of the linguistic communities to which they belong (i.e. Con1; in particular the HCA’s awareness of the presence of a standard dialect vs. non-standard dialects and natural membership in either of them),

(b) the current context of LU and nLU (i.e. Con2; e.g. whether the inter-personal distance between the agents involved in a given CE is a close one thus prompting the activation of a less formal communicative repertoire and use of a less formal behaviour, or a more distant one thus prompting the activation of a more formal communicative repertoire and use of a more formal behaviour. Basically, Con2 may be assumed to equal the well-known pragmatic principles of discourse proposed by Grice (1975), and

(c) the agents' individual (i.e. idiosyncratic) characteristics (i.e. Con3; such as the agent's age, educational background, current health condition, voice characteristics, intellectual alertness, emotional alertness, etc.).

26. The HCA's LCCom and nLCCom, together with the set of the above outlined Cons, are combined into the agent's overall **communicative competence** (CCom). CCom is expressed by the following simple formula:

$$\text{CCom} = \text{LCCom} + \text{nLCCom} + \text{Con}\ \{\text{Con1}, \text{Con2}, \text{Con3}\}$$

27. CCom is defined as scalar, that is, as contained within polar possibilities stretching from the 'lowest' (i.e. minimum value reprsented by the value [+low], also referred to as 'meager') to the 'highest' (i.e. maximum value represented by the value [+high], also referred to as 'robust'), as shown in the figure below. It is assumed that individual HCAs differ as to the degree of their CCom.

Fig. 1

e. **Communicative competence management and the functioning of operational fitness**

28. CRM referred to in section 22b above is assumed to be part of a more general process of **communicative competence management** (CComM).

29. Following previous research work on human resource management (cf. Lawrence, 1985; Lundy, 1994), communicative competence management (CComM) by a given HCA is further

understood as running on different levels (or at different 'depths'), spanning a continuum from the most generic to the most specific. The following levels of CComM are thus postulated:

(a) **the general social-cultural commitment level** whereby the HCAs concentrate on the parity of production and perception tasks in all possible types of communicative behaviours in all possible social contexts, that is, they are aware of the flexibility of CBD and resultant variability in (diversity of) the agent's LUs and nLUs owing to a given agent's awareness of the context of communicative behaviour as such, as well as owing to the agent's current status of CCom. It is assumed that the particular HCAs are generally aware of 'the social-cultural immersion criterion' in the process of communication, that is, they are aware of the linguistic community of which they are a part,

(b) **the social role (career) level** whereby the HCAs - as socially intelligent agents - concentrate on social role (career)-determined production tasks, that is, they are aware of the CComM as a social role (career)-oriented process in which a given HCA interacts communicatively and is constrained by the social role(s) s/he happens, prefers and is forced to play. In other words, the individual HCAs are aware of 'the social role criterion' in the process of communication. Both afore mentioned levels together decide about the HCAs' realization of the socio-communicative aspects of CComM,

(c) **the technical level** whereby the HCAs concentrate on the interchangeability of production and perception tasks, that is, they are aware of the CBD in terms of the agent's communicative performance either as emitter or receiver of messages. The HCA is simply aware of 'the communicative dyad criterion' which is present during a particular CA,

(d) **the economy level** whereby the HCAs concentrate on the economy of performance, that is, they are aware of the principle of maximum simplification of the various language and non-language resources employed in the management of CCom while activating different sensory/production modalities. The HCAs are aware of 'the simplicity criterion' (see also Zipf's Principle of Least Effort, 1949) in the process of communication,

(e) **the production craft level** whereby the HCAs concentrate on the production tasks alone, that is, they are aware of the realization of CCom via the activation of the different modalities which are to participate in the emission/production activities. The HCAs are aware of 'the aesthetic criterion' that may be applied during a CA.

Needless to say, all the above defined levels participate in some way in the agent's overall CComM.

30. HCAs demonstrate different degrees of **communicative effectiveness** (Ceff), ranging from 'minimum' to 'maximum'. Subsequently, all HCAs may be further defined as either communicatively minimally and maximally effective as message producing agents in the sense that a particular HCA's Ceff, expressed through the parameters of **temporal efficiency** (smoothness) and overall **accuracy** with which the message producing agent's CComM is carried out, decides about the reception of that message by a message receiving agent.

31. Subsequently, HCAs demonstrate different degrees of **communicative successfulness** (Csuc), that is, a particular HCA may be characterized as having a sense of being more or less 'successful' in his/her management of CCom as a message producing agent, such that an agent who is defined as minimally effective may also be defined as being minimally successful, that is, as demonstrating a minimum degree of **the sense of smoothness and accuracy** in his/her communicative behaviour, while an agent who is characterized as being maximally effective may also be defined as being maximally successful, that is, as one who demonstrates the highest sense of both smoothness and accuracy in his/her communicative behaviour.

32. HCAs demonstrate different degrees of **communicative comfortability** (Ccomf) in their CEns in the sense that they differ in the degree of their overall and highly individualized **personal awareness of the combined effect of CGs, CCom and CcomM** and thus in the degree of the effective and successful attainment of the former and the effective and successful realization of the latter both in preplanned and accidental CEns (see section f below). Subsequently, it is assumed that the combined effect of Ceff, Csuc, and Ccomf contributes significantly to what may be referred to as the **resilience** (Res) of the human communication potential to various decaying processes which may be working within language itself.

f. **Communicative encounters**

33. All HCAs perform CAs mostly while indulging in **communicative encounters** (CEns) between and among the HCAs. All the CEns are, in turn, properly embedded within the CP.

34. The CEn is defined as either purposeful and preplanned or accidental 'confrontation' of the agent's CCom as well as of his/her general perception/production abilities which were developed phylogenetically (i.e. species-wise) and ontogenetically (i.e. agent-wise) and which are generally maintained within and constrained by the HCP for the sole purpose of attaining either a preset or an ad hoc communicative goal (CG) or a set of goals.

g. **Communicative competence management, communicative tolerance and communicative commitment**

35. HCAs are more or less effective, successful and comfortable in managing their CCom in CAs which take place within the particular CEns.

36. HCAs' variability as to the amount of possessed and demonstrated communicative effectiveness, successfulness and comfortability depends on the degree with which they manage to access and administer the LaSRs and nLRs under the conditions (in the context) of a given CEn.

37. The degree of accessing and administering the LaSRs and nLRs by a particular human agent is termed '**communicative tolerance**' (CT) demonstrated by that agent in a given CEn.

38. The agent's CT is further defined as the sum total of the degree of the agent's CComM ranging from 'meager management', that is, low (or none), to 'moderate management' to 'robust management', that is, fully developed, combined with a degree of the agent's **communicative commitment** (CC) which the agent activates in order to participate in a given CEn so that a particular CG is realized.

39. CC is defined as the agent's degree of communicative involvement ranging from 'meager commitment', that is, low (or none), to 'moderate commitment' to 'robust commitment'(or fully developed), demonstrated by an individual agent in order to activate both the LaSRs and nLRs together with the set of conditions Con1-Con3 and within the appropriate levels of CRM and in order to share in a particular CA while managing a given CEn.

40. The agent's CT may thus be expressed by the following simple formula:

$$CT = CComM+CC,$$

where the agent's CC is further defined as the degree of desirability to proceed with the participation in a given CEn and which the agent has decided to preselect in order to activate and administer the agent's CCom during/within a given CEn, that is, the agent's desirability to become communicatively more or less interactive.

41. The agent's desirability in the sense defined above depends on/reflects his/her **communicative attitude** (CAtt) towards a given CEn, such that:

(a) the greater is the agent's positive CAtt towards a given CEn, the greater is the agent's CC,

(b) the smaller is the agent's positive CAtt to a given CEn, the smaller is his/her CC.

42. CT is never stable across individuals and across all the CEns. In other words, there occurs inter-agent and intra-agent variability as to their CTs: individual human agents vary in their

preferred and actually demonstrated CTs in on-going CEns. This is expressed by the following statements:

(a) the greater is the degree of the CComM+CC complex, the greater is the agent's CT in a given CEn,

(b) the smaller is the degree of the CComM+CC complex, the smaller is the agent's CT in a given CEn.

h. **Typology of HCAs with regard to their communicative competence management capabilities and varied communicative commitment modes**

43. All mature HCAs may be characterized as representing a developmentally determined (i.e. more or less stable) status of their respective CComM, that is, a certain degree of skill of CComM, and who may thus be placed on a continuum as regards the current status of their CComM, extending from 'meager' (expressed by the value [+low]), to 'moderate' (expressed by the values [-low]' [-high-]) to 'robust' (expressed by the value [+high]), which is present in their CEns. The continuum is contained within the polar possibilities expressed by the values [+low] and [+high]. Along the continuum, the following three nodes have been formally identified: (a), (b), and (c). This is shown as follows:

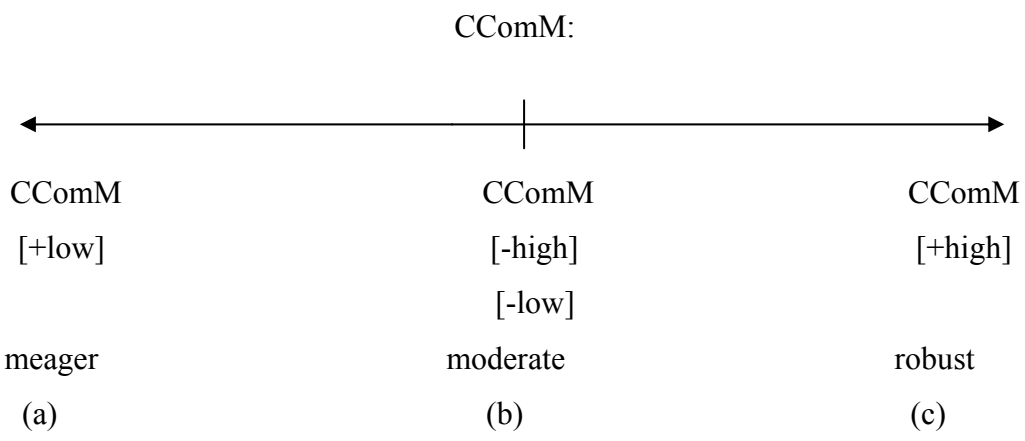


Fig. 2

where:

←→ - represents a continuum of types

(a) - represents a low (or meager) degree of CComM of a given HCA

(b) - represents a moderate (transitory) degree of CComM of a given HCA

(c) – represents a high (or robust) degree of CComM of a given HCA

44. All HCAs, both the growing and the mature ones, may also be characterized as being able to enter an appropriate CC mode, that is, as demonstrating a degree of CC while getting involved in a particular CEn. The agent's CC may be distributed along a continuum within the polar possibilities expressed by the values [+low] and [+high]. Along the continuum, the following three nodes have been formally identified: (a), (b), and (c). This is shown as follows:

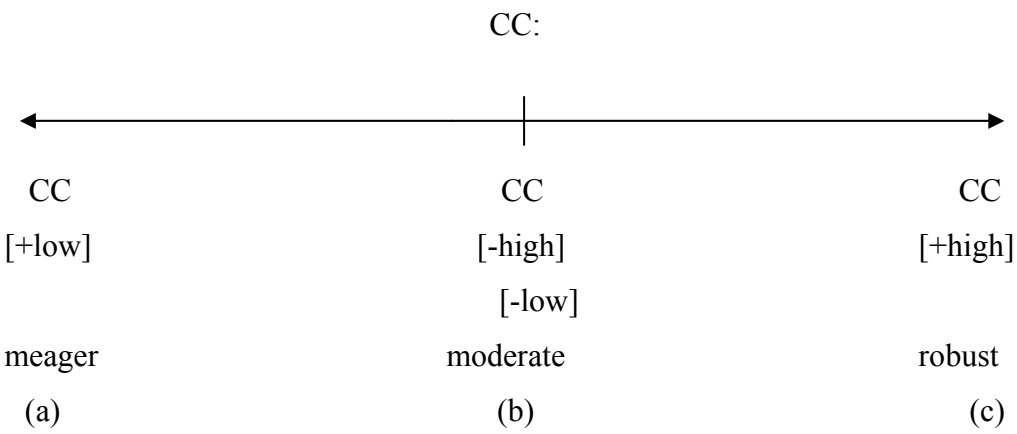


Fig. 3

where:

←→ - represents a continuum of types

(a) - represents a low (or meager) degree of communicative commitment (alertness) and resultant non-brisk responsiveness of a HCA in a given CEn

(b) - represents a moderate (transitory) degree of communicative commitment and responsiveness of a HCA in a given CEn

(c) - represents a high (or robust) degree of communicative commitment and brisk responsiveness of a HCA in a given CEn

i. **Typology of HCAs with regard to their communicative tolerance**

45. Subsequently and consequently, a number of possibilities may be found as regards the HCAs' overall CT. Thus, the following formally identifiable types of HCAs may be postulated to exist along a continuum with regard to CT (i.e. the sum of the CComM+CC complex, see point (40) above):

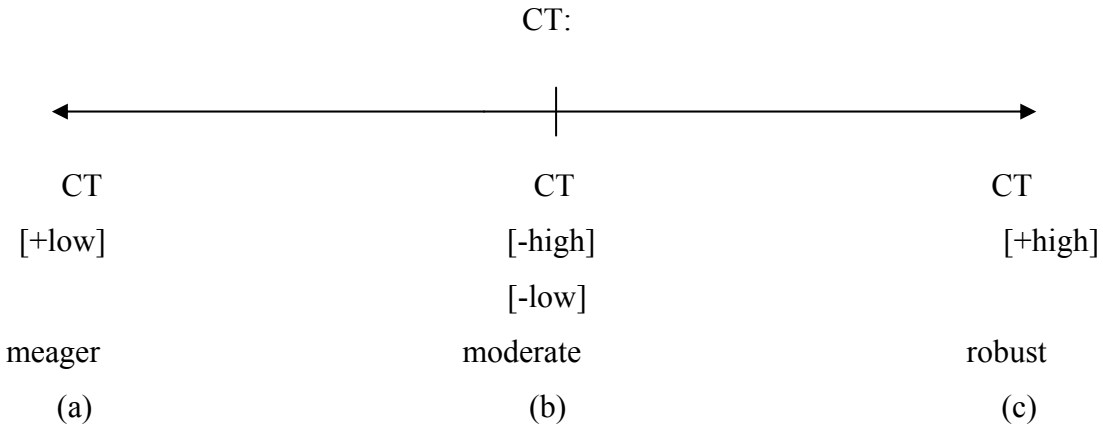


Fig. 4

where:

←→ - represents a continuum of types

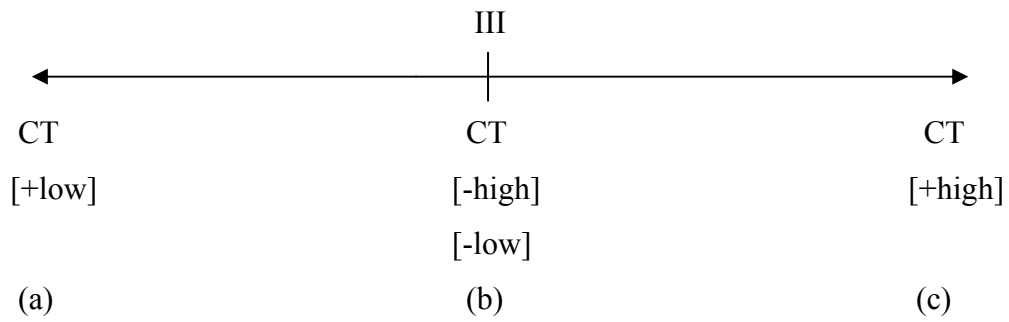
(a) - represents a low (or meager) degree of CT of a HCA in a given CEn

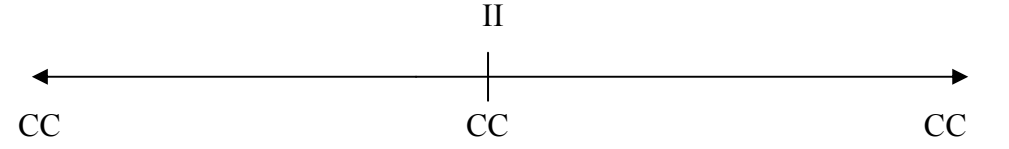
(b) - represents a moderate (transitory) degree of CT of a HCA in a given CEn

(c) - represents a high (or robust) degree of CT of a HCA in a given CEn

j. **A general multi-layered typology of HCAs comprising relationships between communicative competence management, communicatice commitment, and communicative tolerance**

46. As a result of the afore presented discussion, the following general matrix may be postulated thus allowing for a more general typology of HCAs:





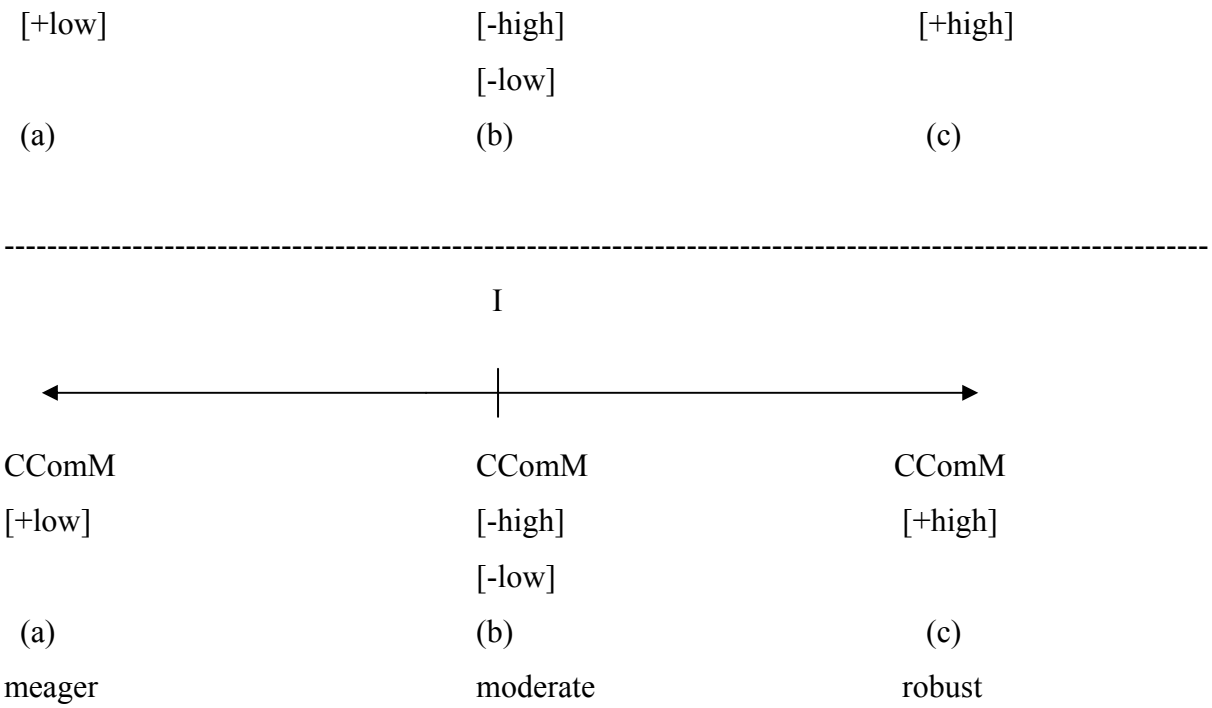


Fig. 5

where:

$\longleftrightarrow$ - represents a continuum of types

I - the **basic** (founding) communicative competence management level, which may be more or less stable or unstable depending on whether a mature HCA or a growing HCA is considered

II – the **participating** communicative commitment level

III – the **derived** communicative tolerance level which is the sum total of levels I and II.

47. As has already been stated in (42) above, the CT, which is never stable across individuals and across all the CEns, may thus assume different values, that is, it may extend from low ('meager'), through mid ('moderate') to high ('robust').

48. This formal continuum may further allow one to propose a formal typology of HCAs as comprising the following types: 'meager communicators', 'moderate communicators', and 'robust communicators', respectively.

49. A **meager human communicating agent** (meHCA, also referred to as 'meager communicator') is one whose CT has been characterized as [+low] in both CComM and CC. Meager communicators ma be additionally characterized as being communicatively less self-sufficient by virtue of having limited or no access to the CRs. It should also be added at this

point that in the extreme case of low-degree communicative commitment (i.e. when the agent's CC shows the lowest value [+low]), a meager communicator may represent the communication potential of a non-communicator who may thus be characterized as demonstrating the lowest possible degree of communicative interactivity during/within a given CEn.

50. A **moderate human communicating agent** (moHCA, also referred to as 'moderate/mixed communicator') is one whose CT has been characterized as [-high] and [-low] in both CComM and CC. The moHCA is placed between the two polar possibilities and may be referred to as a transitory-degree communicating agent (also referred to as 'mixed communicator'). The following formal types of mixed communicators may be postulated:

moderate/mixed communicator, where: CCom + CC
[-high] [-high]
[-low] [-low]

moderate/mixed communicator, where: CCom + CC
[+high] [-high]

moderate/mixed communicator, where: CCom + CC
[-high] [+high]

51. A **robust human communicating agent** (roHCA, also referred to as 'robust communicator') is one whose CT has been characterized as [+high] in both CComM and CC. Robust communicators may be additionally characterized as highly interactive and communicatively fully self-sufficient by virtue of having full access to the CRs.

52. As has been shown, the above postulated types of HCAs, that is, MeHCA, MoHCA, and RoHCA, who have been postulated on the basis of the combined effect of their CT may be arranged in a linear fashion, with the bidirectional arrow (←→) indicating flexible movements of the HCAs, in particular those agents whose CComM has been defined as robust, along the continuum which stretches between the generic polar values of 'meagerness' versus 'robustness'.

k. **HCA dynamism: developmental versus pragmatic aspects**

53. As has been indicated above, the notion of the HCA is dynamic in the sense that the individual HCAs may move freely along the continuum whereby an individual HCA may at a given moment during an ongoing CEn occupy a given point on that continuum. Basically, the HCA's dynamism in terms of his/her floating CT may be understood in the following ways:

(a) the agent's CT is determined by the agent's **developmental** (ontogenetic) **communicative sequence** (DCS), that is:
(ai) the agent may initially occupy the meager node on the continuum and start moving towards the robust node on that continuum. That is, when a particular HCA, such as a growing child who is properly encompassed by the HCP, under conditions of maturational sequence (i.e. while undergoing what may be called the 'unfolding growth process' of the agent's HCP with regard to the biological and social-cultural domains), also due to ongoing informal and formal education as well as owing to a growing number of CEns in which s/he participates, is naturally moving from the meager node to the robust node whereby the agent maximizes his/her communication potential and eventually becomes a robust and thus fully effective, successful and comfortable communicator,
(aii) the agent may occupy the robust node and start moving towards the meager node. That is, when a particular HCA, such as an aging individual who is encompassed by the HCP, under irreversible conditions of human life span (i.e. while undergoing what may be called the 'folding up decline process' of the agent's HCP, especially with regard to the biological but also to the social-cultural domains), is naturally moving from the robust node to the meager node, thus eventually reaching a stage which is characterized by generally meager and increasingly frailed (though individually highly varied) degree of personal communication potential,
(b) the agent's CT is determined by the agent's **pragmatic communicative sequence** (PCS): that is, when an individual human agent, who has ideally established him/herself in the robust node and has thus become a robust communicator, consciously optimizes his/her LU and nLU, that is, while maintaining maximum communication potential, s/he selects, under environmental (i.e. agent-external and agent-internal pressures for the purpose of a given CA performed within a particular CEn), any of the multitude of possibilities offered by the above continuum. In this case, one may talk of the agent's **communicative policy choices** (CPC) made in accordance with his/her CAtt as well as in accordance with the agent's on-line assessment of **cost and gains** (CaG) of his/her communicative commitment in a particular CEn. These policy choices may be both short-term and long-term ones.

l. **Typology of HCAs with regard to the activation and control of modalities**

54. In addition to the above discussed typology and with regard to the modalities involved, all HCAs may be divided into the following categories of communicators:
(a) exclusive (i.e. 'pure') categories:
- **speaker-communicators**, that is, those agents who exclusively activate and control the LaSRs within the exclusive confines of the vocal-auditory modality,
- **signer-communicators**, that is, those agents who exclusively activate and control both the nLRs within the confines of the tactile and visual modalities, and
(b) a generic (i.e. mixed speaker-signer) category:
- **speaker-signer communicators** (the so-called 'generic communicators'), that is, those agents who activate and control both the LaSRs and nLRs synergistically across the afore mentioned modalities.
55. Obviously, with the exclusion of those individuals who are hearing-impaired, most HCAs naturally fall within the 'generic communicator' category, as has been shown convincingly by research on the intertwined use of the LaSRs and nLRs in Cas (see selected works in the bibliography). This fact obviously has a bearing on the question of the interrelatedness of all the CRs (see points 3 and 9 above) and thus also on the problem of assigning appropriate significance to both types of resources both by the HCAs in the actual realization of the CP as well as in research practice.
56. It is thus postulated that one cannot simply refer to a 'speaker of a given natural language', e.g. English or Polish, unless one focuses on the HCA's use of the LaSRs exclusively in the vocal-auditory modality. Thus, although reference to a communicator as a 'speaker' of a language (i.e. speaker-communicator) is theoretically possible, one can hardly envisage making reference to language exclusively within the communicative famework outlined here, since most HCAs are, in fact, generic communicators in the sense described above. It is therefore assumed here that the mixed type of 'speaker-signer communicator' in a given natural language constitutes a more appropriate frame of reference, for it encompasses an overwhelming majority of the HCAs.

III. Overall communicative behaviour in the light of the Communication Resource Management approach to the HCAs' communicative competence

It should be emphasized once again that the major concept that lies at the foundation of the present paper is that of general language and non-language resource management by the HCAs based, in turn, on the concept of **human resource management** (hence referred to in pertinent literature as HRM; see, for example, Beer et al. 1984; Storey, 1989; Guest, 1990; Butler et al., 1991; Blyton and Turnbull 1992; Storey, 1992). Subsequently, it has been assumed that the individual HCAs use language and speech and non-language resources to attain communicative goals. More precisely, a more or less effective, successful and comfortable attainment of a communicative goal is assumed to be determined by the HCA's degree of awareness of being a manager of the CRs in a complex communication process meant as an interplay of a number of factors among which one should enumerate the following ones:

(a) the HCA's overall CComM (i.e. knowledge and utilization of CRs, that is, LaSRs and nLRs),
(b) the agent's CAtt towards a particular involvement in a particular CEn based on the agent's assessment of the nature of a given CEn (e.g. whether the agent is involved in a planned or accidental CEn, or whether the agent takes an affective stand in the CEn),
(c) the agent's resultant CC,
(d) the set of Cons at the moment of a particular CEn (i.e. Con1, Con2, and Con3)
(e) the HCA's on-line and long-term decision concerning the agent's selection of an appropriate node and thus performing either as a 'robust', 'mixed', or 'meager' communicator,
(f) HCA's awareness of the outcomes of communicative commitment
(g) actual outcomes of the agent's CT
(h) the agent's awareness of cost and effectiveness of his/her involvement in a given CEn, and
(i) the agent's awareness of long-term consequences of his/her involvement in CEns, resulting in the grounding of such features as:
- maintaining the agent's preferred degree of CT,
- maintaining the agent's preferred style of communicative performance (i.e. preferring to be a robust, moderate, or meager communicator), and
(j) the agent's awareness of securing his/her societal well-being through the maintenance of an appropriate CT and an appropriate adaptive management of style(s) of communicative performance.

The HCA may, in the sense of being in control of the above, be called a strategic manager of his/her CCom, and the entire process may thus be referred to as the the agent's **communicative competence strategic management** (CComSM).
On the basis of the above discussion, one may propose the following working definition of the notion of the HCA's CComSM:

"the human communicating agent's communicative competence strategic management is the overall pattern of planned (and unplanned) communicative activities undertaken by the agent in the process of the agent's activation and administering of his/her language and speech and non-language resources in order to attain a communicative goal or a set of goals in the process of communication and in the constantly changing environment".

Summing up, a feasible DRAAM model of human communication should, in principle, include the interaction of all the elements which have been presented above and which properly characterize the immensely intricate phenomenon of human communication. In particular, the model has focused on the following major elements:
1. **the external environment** (EE) which provides a framework for a set of external constraints within which the HCAs operate in their CComSM. The EE is understood here as comprising the following: UCS, UCE, HCP, HCN, species-specific social-cultural domain, Con1,
2. **the internal environment** (IE) which provides a framework for a set of internal contextual variables which co-determine the HCA's CComSM. IE is understood here as comprising the following: LaSRs, nLRs, LCCom, nLCCom, Con2, Con3. Together, the EE and the
IE constitute the **Input** (I) to communicative behaviour dynamics.
3. **communicative behaviour dynamics** (CBD) which provides a framework for encompassing all the constituents of the CP. They comprise the following: HCA, CaG, CAtt, CC, CEn, CLaSR, CnLR, CPC, CW, CG, LU, nLU,
4. **the outcomes** (O) which comprise a set of possible outcomes of the CComSM process. They comprise the following: CA, Ceff, Csuc, Ccomf.

As has been indicated above, the process of CComSM must reflect the contribution of the external environment, especially in the form of society and culture in which an individual HCA is living. As is well known, however, there are extensive problems with defining the very term 'culture', since there occur in modern literature a breath-taking multitude of

available definitions which range from philosophical to biology-oriented. The one I would like to rely on in this paper is a broad definition of culture proposed by Adler and Jelinek (1986) which properly combines the following expedients: the philosophical (i.e. focused on the agent's 'being in the world', or, in the surrounding reality), the formal (a set of universal and culture-specific rules) and the social (i.e. both the idea of sharing the same species-specific cognitive apparatus by the entire species *Homo* and the social group-specific ways of using the apparatus). Thus, according to these authors:
"culture (...) is frequently defined as a set of taken-for granted assumptions, expectations, or rules for being in the world (...). The culture concept emphasizes the shared cognitive approaches to reality that distinguish a given group from others".

It is further assumed that the relevant areas of culture comprise the following:
- social
- historical
- technological
- political/legal
- economic.

All of the above mentioned areas further contribute to the process of CComSM by individual HCAs as constituting the external environment, thus making the entire process rely on a truly multivariable system working in support of the HCA's on-line decisions concerning the activation of the language and non-language resources and their control.

IV. Toward an ecology of human communication, or, what kind of HCA is optimal?

On the basis of the foregoing discussion, the following types of human communicating agents have been recognized:
a. Language and non-language resource managers who behave according to the so-called 'Oskar Syndrome' (from G. Grass' *The tin drum*), whose language resources are low (or rather low) and who are, therefore, for ever using juvenile/limited (i.e. underdeveloped) language resources, irrespective of their changing communicative commitment, in encounters with other HCAs.
b. Language and non-language resource managers who behave according to the so-called 'Gulliver Syndrome' (from J. Swift's *Gulliver's travels*), that is, whose language resources are high and who are for ever interactively changing the volume of language resources

activated each time for the purpose of language use in encounters with other HCAs, i.e. once small once big, once moderate, depending on their current assessment of the changing context of communicative encounters and their changing communicative commitment.

c. Language and non-language resource managers who behave according to the so-called 'Petronius Syndrome' (from H. Sienkiewicz's *Quo vadis*), that is, whose language resources are rather very high and who are for ever using the most sophisticated language resources, irrespective of their current assessment of the changing context of communicative encounters and their changing communicative commitment.

Which of these types of communicators ought to be preferred in human communication remains an entirely open question. The question is, however, extremely important, for its practical resolution in favour of any of these types must have (and will have) a bearing on the educational practices of any educational system in preparing the human agents for undertaking future communicative efforts which should be both effective, successful, and comfortable. The problem discussed in the present paper within such a broad perspective obviously requires further investigations, this time, however, necessarily parceled to a number of separate sections. One may, nevertheless, at this point already opt for the type of human communicating agent who will show both a drive towards attaining higher language and non-language resources, higher communicative competence and higher communicative competence management skills, and who will also strive towards attaining stability with regard to the maximum amount of language resources and maximum performance skills in the face of a host of variable parameters which most naturally encompass human communication. It is hoped that in this way, with the robust communicators being at the top of the hierarchy of the whole population of human communicating agents participating in various human communication networks, both the human communication potential, language and non-language resources and communicative competence management will be kept on sufficiently diversified and ecologically sustainable and resilient levels.

References:

Adger, W. 2000. "Social and ecological resilience: are they related?". **Progress in Human Geography** 24. 347-364.

Adler, N.J. and M. Jelinek. 1986. ”Is organization culture bound?”. **Human Resource Management** 25.1. 73-90.

Beer, M., B. Spector, P.R. Lawrence, D.Q. Mills and R.E. Walton. 1984**. Managing human assets**. New York: Macmillan.

Berkes, F. and C. Folke. (eds.). 1998. **Linking social and ecological systems: management practices and social mechanisms for building resilience**. Cambridge: Cambridge University Press.

Berkes, F., J. Colding and C. Folke. 2000. ”Rediscovery of traditional ecological knowledge as adaptive management”. **Ecological Applications** 10. 1251-1262.

Berkes, F., J. Colding and C. Folke. (eds.). 2002. **Navigating social-ecological systems: building resilience for complexity and change**. Cambridge: Cambridge University Press.

Blyton, P. and P. Turnbull. (eds.). 1992. **Reassessing human resource management**. London: Sage Publications.

Butler, J.E., G.R. Ferris and N.K. Napier. 1991. **Strategy and human resource management**. Cincinati: South-Western Publishing.

Chen, M.J. and C.A. Desoer. 1982. ”Necessary and sufficient conditions for robust stability of linear distributed feedback systems”. **International Journal of Control** 35.2. 255-267.

Cherry, C. 1957. **On human communication**. Cambridge, Mass.: The MIT Press.

Cole, P. and J.L. Morgan. (eds.). 1975. **Syntax and semiotics**. Vol. 3: **Speech acts**. New York: Academic Press.

Grass, G. [1959. **Die Blechtrommel**]. Also 1962. **The tin drum**. Translated by Ralph Manheim. London: Secker and Warburg.

Grice, P. 1975. ”Logic and conversation”. In Cole, P. and J.L. Morgan. (eds.). Vol. 3.

Guest, D. 1990. ”Human resource management and the American dream”. **Journal of Management Studies** 27.4. 377-397.

Holling, C.S. 1973. ”Resilience and stability of ecological systems”. **Annual Review of Ecology and Systematics** 4. 1-23.

Holling, C.S. (ed.). 1978. **Adaptive environmental assessment and management**. New York: Wiley.

Lawrence, P.R. 1985. ”The history of human resource management in American industry”. In Walton, R.E. and P.R. Lawrence. (eds.).

Lundy, O. 1994. ”From personnel management to strategic human resource management”. **The International Journal of Human Resource Management** 5.3. 687-720.

MacFarlane, A.G.J. and N. Karcanias. 1976. ”Poles and zeros of linear multivariable systems: a survey of the algebraic, geometric and complex-variable theory”. **International Journal of Control** 24.1. 33-74.

Oksaar, E. 1979. ”Zur Analyse kommunikative Akte”. **Wirkendes Wort** 29. 391-404.

Peterson, G.D. 2000. “Political ecology and ecological resilience: an integration of human and ecological dynamics“. **Ecological Economics** 35. 323-336.

Puppel, S. 1988. **Aspects of the psychomechanics of speech production**. Poznań: Wydawnictwo Naukowe UAM.

Puppel, S. 2002. ”A nonmonotonic account of human verbal communicative behaviour versus animal communication: an attempt at converging the linguistic and information processing perspectives”. **Lingua Posnaniensis** XLIV. 131-144.

Rogers, A. 1988. ”Does biology constrain culture?”. **American Anthropologist** 90.4. 819-831.

Sienkiewicz, H. [1896. **Quo vadis**]. Also 1993. **Quo vadis**. New York: Macmillan.

Storey, J. (ed.). 1989. **New perspectives on human resource management**. London: Routledge and Kegan Paul.

Storey, J. 1992. **Developments in the management of human resources**. Oxford: Blackwell.

Swift, J. [1726. **Gulliver's travels**]**.** London: B. Motte. Also 1906. **Gulliver's travels and other works**. London: Routledge.

Van der Heijden, K. 1996. **Scenarios: the art of strategic conversation**. New York: Wiley.

Walton, R.E. and P.R. Lawrence. (eds.). 1985. **Human resource management: trends and challenges**. Cambridge, Mass.: Harvard University, Harvard Business School Press.

Weaver, W. and C.E. Shannon. 1949. **The mathematical theory of communication**. Urbana, Ill.: University of Illinois Press.

Zhou, K., J.C. Doyle and K. Glover. 1996. **Robust and optimal control**. Englewood Cliffs, N.J.: Prentice-Hall.

Zipf, G.K. 1949. **Human behavior and the principle of least effort: an introduction to human ecology**. Reading, Mass.: Addison-Wesley Press.

A list of abbreviations used in the paper:

AA	-	Artificial Agent
CA	-	Communication Act
CD	-	Communication Domain
CN	-	Communication Network
CP	-	Communication Process

CR	-	Communication Resource
CRM	-	Communication Resource Management
CS	-	Communication System
CaG	-	Cost and Gains
Catt	-	Communicative Attitude
CBD	-	Communicative Behaviour Dynamics
CC	-	Communicative Commitment
CCom	-	Communicative Competence
Ccomf	-	Communicative Comfortability
CComM	-	Communicative Competence Management
CComSM	-	Communicative Competence Strategic Management
Ceff	-	Communicative Effectiveness
CEn	-	Communicative Encounter
CG	-	Communicative Goal (or a set of goals)
CPC	-	Communicative Policy Choice
CRS	-	Communicative Resource System
Csuc	-	Communicative Successfulness
CT	-	Communicative Tolerance
CW	-	Communicative Willingness
Con	-	Condition
DCS	-	Developmental Communicative Sequence
EE	-	External Environment
HCA	-	Human Communicating Agent
HCN	-	Human Communication Network
HCP	-	Human Communication Potential
HRM	-	Human Resource Management
I	-	Input
Ia	-	Interactedness
IE	-	Internal Environment
Ir	-	Interrelatedness
LaSR	-	Language and Speech Resources
LC	-	Linguistic Competence
LCCom	-	Linguistic Communicative Competence
LU	-	Language Use

MeHCA	-	Meager Human Communicating Agent
MoHCA	-	Moderate Human Communicating Agent
nHCA	-	non-Human Communicating Agent
nHCP	-	non-Human Communication Potential
nLCCom	-	non-Linguistic Communicative Competence
nLR	-	non-Language Resources
nLU	-	non-Language Use
OF	-	Operational Fitness
O	-	Outcome
PCS	-	Pragmatic Communicative Sequence
Res	-	Resilience
RoHCA	-	Robust Human Communicating Agent
RM	-	Resource Management
UCE	-	Universal Communication Enterprise
UBS	-	Universal Biological Space
UCS	-	Universal Communication Space
USCS	-	Universal Social-Cultural Space