

TOWARDS PROTOLANGUAGE: BODILY REACTIONS REPRESENT EMOTIONAL TYPES*

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In this paper, I attempt to offer a general outline of my views on the origin and evolution of language. I do not pretend in any way to a completely new conception of language evolution. It seems to me that all the most important and productive hypotheses about the origin of language have already been made before, and it is only a matter of putting the pieces of the puzzle together correctly. As far as I can see it, the evolution of language is directly related to the embedded and embodied emotional types, which served as the basis for the subsequent categorization of perceived objects, and thus laid the ground for the formation of first an internal language (of thought), and then an external verbal language. Consistent with this, the paper is organized as follows. In the Introduction I briefly describe the problem I am facing in this article and outline a plan for solving it. Next section comprises a survey of relevant empirical findings related primarily to the processing and understanding of abstract terms and concepts. In my view, it supports the idea of the close connection of abstract terms proceeding, and thus language comprehension, with emotional states. The third section provides relevant theoretical considerations of the relationship between emotions, cognition, and language. Consistently considering various theories of emotions and concepts of language formation, I pay attention to the connection between affective states and language as a sign system. In the fourth section, my views are presented directly. In so doing, I illustrate my approach with a telling example that shows how, in the course of evolution, embedded and embodied emotional responses and reactions could become the building blocks first for the internal language of thought, and then for the external natural language.

Keywords: language evolution, emotions, type-token relation

К ПРОТОЯЗЫКУ: ТЕЛЕСНЫЕ РЕАКЦИИ РЕПРЕЗЕНТИРУЮТ ЭМОЦИОНАЛЬНЫЕ ТИПЫ

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В этой статье я попытаюсь в общих чертах изложить свои взгляды на происхождение и эволюцию языка. Я никоим образом не претендую на совершенно новую концепцию эволюции языка. Мне кажется, что все наиболее важные и продуктивные гипотезы о происхождении языка уже были высказаны раньше и дело лишь в том, чтобы правильно сложить кусочки головоломки. Насколько я могу судить, эволюция языка непосредственно связана с врожденными и телесно воплощенными эмоциональными типами, которые послужи-

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ли основой для последующей категоризации воспринимаемых объектов и тем самым заложили фундамент для формирования сначала внутреннего языка (мышления), а затем и внешнего вербального языка.

В соответствии с этим статья организована следующим образом. Во введении я кратко описываю проблемы, которые рассматриваются в этой работе, и намечаю план изложения. Следующий раздел содержит обзор результатов соответствующих эмпирических исследований, связанных в первую очередь с обработкой и пониманием абстрактных терминов и понятий. На мой взгляд, эти результаты подтверждают идею о тесной связи обработки абстрактных терминов и, как следствие, понимания языка с эмоциональными состояниями. Третий раздел содержит теоретические соображения и обобщения установленной взаимосвязи между эмоциями, познанием и языком. Последовательно рассматривая различные теории эмоций и концепции формирования языка, я делаю акцент на связи между аффективными состояниями и языком как знаковой системой. В четвертом разделе излагается непосредственно моя интерпретация этой связи. При этом я иллюстрирую свой подход примером, который проясняет, как в ходе эволюции встроенные и телесно воплощенные эмоциональные реакции могли стать строительными блоками сначала для внутреннего языка мысли, а затем и для внешнего естественного языка.

Ключевые слова: эволюция языка, эмоции, отношение тип-пример

In short: acquiring a first language is, prima facie, a very complex cognitive achievement; so far, neither pigeons nor computers are able to do it; nor has cognitive science been able, so far, to explain it.

J.A. Fodor and Z.W. Pylyshyn

1. Introduction

Over the last years, rapid progress in the field of cognitive and neuroscience has continued. New experimental, primarily noninvasive, measurement methods and techniques have provided researchers with an unprecedented level of access to the inner workings of the active brain. Naturally, such a serious increase in the amount of empirical data led to a change in the way neuroscientists view the function of the brain and its interaction with the mind. All these achievements of recent years require their theoretical understanding and interpretation. It is not surprising that an increasing number of philosophers are trying to overcome the notorious explanatory gap. This paradigm change manifested itself both in the issues that philosophers study and in the research tools, they rely on and thus makes these research interdisciplinary.



This paper is an example of such research, in which I try to take a new look at the problem of the origin and evolution of language through the prism of emotions and affects.

I consider the evolution of language as a step-by-step process of the internal language thoughts-as-signs transformation into referents of registrable bodily reactions on perceived stimuli as proto-signs of externalized language. My approach does not claim to be completely new and different; on the contrary, in a certain sense, it grows out of a lot of research and is based on a whole range of empirical data. This has significantly shaped the structure of my work. In the next section, I will focus primarily on the results of empirical research that has examined the relationship between emotion processing and understanding abstract terms. In the third section, I will focus on the theoretical conceptions of language origin. Finally, in the fourth section, my vision of language is directly presented, based on the primacy of the internal emotional language of thought over the externalized verbal language.

2. Abstract Concepts and Emotions: Empirical Findings

As a starting point in this short review, I would like to concern a hotly debated matter of abstract terms and corresponding concepts processing and representation. The problem with such linguistic expressions (and mental entities) can be considered at least in three aspects.

First of all, though it may seem obvious to someone, we need to draw a clear distinction between abstract and concrete concepts. Typically, concrete concepts are interpreted as those whose extension consists of perceptually experienced objects, like *tables* or *cats*, whilst abstract concepts refer to abstract objects, such as *numbers* or *freedom*. However, these intuitive considerations need formal explication. On the assumption that concepts are meanings of matchable words, the problem of demarcation can be reduced to the linguistic level. Consider as a sample of commonly used reliable sources Medical Research Council (MRC) Psycholinguistic Database (http://websites.psychology.uwa.edu.au/school/MRCDatabase/uwa_mrc.htm). It contains statistical measurements of approximately 26 psycholinguistic properties for 150000 words and the characteristics of correctness/abstractness among them.

‘The information on most of these qualities for individual words, such as familiarity, ...concreteness... is gathered by directly probing language users. Large groups of respondents are asked to rate a particular quality of words presented to them. The judgments are usually made on a scale from 1 to 7. The final rating assigned to a particular word is the mean value of scores given to it by respondents’ [Leńko-Szymańska, 2019, p. 124]



Thus, the criterion for the distinction of abstract words (and concepts) from concrete ones appears to be purely empirical and based on the statistical analysis of the opinions of mother-tongue speakers. Meanwhile, there are also other criteria to consider. For example, in logic, we inherit a tradition traced back to medieval scholastics. It assumes ontological presupposition that the domain of discourse (universe) consists of entities of two types: individual and their characteristics (properties, relations, functions, etc.), where the latter can be predicated (attributed) of the former. Hence only individuals possess separate and independent (that is, *individual*) being. These are concrete terms (concepts) that denote individuals, whereas abstract terms and concepts refer to characteristics in a broad sense.

All aforesaid leads to a puzzling question: what do recent neuroscientific series of studies aimed at representation and processing of concrete concepts study in actual fact? Is it the neural bases of the distinction between concrete and abstract concepts or between the folk psychological interpretation of concrete and abstract concepts? The question remains open, but these considerations deserve taking into account.

Secondly, dealing with semantically ambiguous words also causes problems and questions. These terms may have multiple meanings. Living aside such simple cases as *bank*, how one can interpret the following Concreteness Ratings drawn from English Lexicon Project: *about* – 1,770; *abort* – 2,830; *above* – 3,330. The same source marks as equally concrete (Concreteness Rating 4,100) highly ambiguous words *sex*, *slip*, *tide* and quite abstract (at least from a logical point of view) *housework*. The situation is widespread, for example [Harpaintner, Trumpp, Kiefer, 2018] counts *laugh* as concrete, and the authors of [Lupyan, Winter, 2018] proceed similarly with *blinking*. [Pexman, Yap, 2018] use event-related functional magnetic resonance imaging in conjunction with a semantic categorization task to investigate the individual differences in semantic decision performance. They come to the conclusion that high vocabulary participants can more easily access semantic information and better emphasize aspects related to the task.

Thirdly, understanding of abstract terms and concepts became a subject for intensive debate between those who adhere to a classical amodal symbolic system model and proponents of semantic grounding or ‘embodiment’ position in processing and representation of meaning. According to the classical view, abstract concepts are linguistically based. The embodied approach ([Barsalou, 2010]) treats meaning through simulations of introspective experience and situations.

Quite predictably, grounded interpretation of abstract concepts met serious critics. A considerable part of these critics addresses the explanation of how abstract concepts can be grounded in sensory-motor experiences [Machery, 2016; Pecher, Zeelenberg, 2018; Löhr, 2019]. Higher cognitive procedures, such as reasoning or decision making, are symbolic



in the sense that they presuppose operating mental symbols. Accordingly, these symbols are divorced from direct perception. It becomes unclear how the representation of abstract meanings (thoughts, ideas, etc.) to which we do not have sensorimotor access is possible. Or, if one does assume that these representations reside in our sensory and motor system what is, for example, a proper counterpart of *number five*? Things are getting worse when concepts like *game* are concerned, whose meaning cannot be connected with one idea or prototype: the games are very different, and each type may apparently be simulated in a different way.

Getting back to abstract concepts in embodiment perspective, it will be noted that there is a strong research trend in the field offering rich experimental data in support of the idea that affective states play an important, if not crucial, role in their proceeding and representation. Among most-sited papers are those by G. Vigliocco, S. Kousta et al. [Vigliocco, Meteyard, Andrews et al., 2009; Kousta, Vigliocco et al., 2011; Vigliocco, Kousta, Della Rosa et al., 2014]. They trace their approach to [Barsalou, Wiemer-Hastings, 2005], and that way provide empirical support for modern ‘concept empiricism’. In so doing, they address a particular type of experiential information, emotional content, and demonstrate that it plays a crucial role in the processing and representation of abstract concepts: statistically, abstract words are more emotionally valenced than are concrete words. Applying correlation analysis, they show that abstract terms receive higher ratings for affective associations (both valence and arousal) than concrete ones. In [Zdrzilova, Pexman, 2013], the authors state that valence facilitates ‘abstractness’ decisions in the SCT (semantic categorization task) and acknowledge that this fact needs to be explored more thoroughly in future research. The chapter [Glenberg, Becker et al., 2005] contains a section entitled ‘Grounding language in emotional states’, where the authors address the question of how does emotional state influences language processing? Based on their research, they come to the conclusion that: ‘language about emotions is grounded in emotional states of the body, and simulating those states is a prerequisite for complete and facile understanding of the language about those states’ [Glenberg, Becker et al., 2005, p. 120].

Consistent with this line of research, it was revealed that brain regions supporting language are involved in emotion. Similar findings are reported by different researches holding sometimes opposite views on their interrelations ([Oosterwijk, Lindquist, Anderson, et al., 2012; Shablack, Lindquist, 2019; Pauligk, Kotz, Kanske, 2019]). For example, it was found that abstract words activate anterior cingulate cortex and left inferior frontal gyrus, regions connected to emotion processing. Regarding anatomy and topology of emotions and language, a number of empirical research (for instance, [Wilson-Mendenhall, Barrett et al., 2011] and [Lindquist, 2017]) show that: brain regions supporting language are involved in emotion; manipulating language alters emotion; language and



emotion have more than a mere unidirectional relationship. According to F. Pulvermüller ‘the manifestation of emotions in actions becomes the crucial link between word use and internal state, and hence between sign and meaning’ [Pulvermüller, 2013, p. 466]. It should not be left unmentioned works of G. Northoff [Northoff, 2012; Herbert, Ethofer et al., 2018] and R.A. Zwaan [Fischer, Zwaan, 2008; Zwaan, 2016] with colleagues, whose research, though each in one’s own way, support the ideas of sensorimotor representation of abstract concepts and corresponding linguistic expressions, as well as emotion knowledge grounding semantically at least some abstract words.

In summary, empirical findings witness the close connection of abstract terms proceeding, and thus language comprehension, with emotional states. The discussed above problem with grasping abstract concepts lies not at the empirical level *per se*, but rather at the level of theory that in particular presupposes choosing the theoretical background, experiment design and interpretation of data received. All these considerations need theoretical reflection.

3. Emotions, Cognition and Language: Theoretical Considerations

There are a great many theories of emotions and a comparable multitude of various conceptions of the origin and evolution of language. In this section, I am not minded to consider them all in detail, rather I will touch those in line with my research. This avenue leads from emotions towards language, and I will follow it and start off with emotions.

Generally speaking, I adhere the evolutionary theory of emotions’ origin. This position stems from Charles Darwin’s views presented in his 1872 book ‘The expression of the Emotions in Man and Animals’. Nowadays evolutionary approach proceeds from (a) the adaptive role of emotions, (b) their evolution through natural selection, and (c) the existence of basic universal emotions. There is a plethora of opinions about which emotions are basic (compare [Plutchik, 1980; Oatley, Johnson-Laird, 1987; Ekman, 2003; Izard, 2007], and [Panksepp, Watt, 2011]). For example, Robert Plutchik in distinguished eight basic emotions, where four of them are paired with their polar opposites forming famous ‘wheel of emotions’: joy and sadness; anger and fear; trust and disgust; and surprise and anticipation. According to P. Ekman (see, for example [Ekman, Cordaro, 2011]) basic emotions have distinctive universal signals. In what follows I will return to this idea, at the moment it would be sufficient to describe signals as observable responses to stimulus comprehensible by other beings and thus potentially fit for communication. Without getting into specifics I claim that I share these



three (a-c) underlying rationale of my approach to be set forth in the next section.

The next step in the intended direction is to make a passing mention of several conceptions of emotions that can be considered as motivating and underlying my vision. Deciding among this plethora of ideas, I would like to name first Cannon-Bard theory of emotions which contrary to James-Lange theory suggests that stimuli cause feelings and independently but simultaneously physical reactions. One such immediate bodily reactions acquired the name 'Fight-or-Flight response' ('Fight-Flight-or-Freeze' as currently drafted) for it is an adaptive instinctive response to a sudden threat. For example, in humans, the perception of danger (e.g. big aggressive dog) automatically triggers 'pre-installed' response to confront it, to escape, or just to freeze on the spot. From a more recent Schachter-Singer [Schachter, Singer, 1962] two-factor theory I would like to adopt the idea of the cognitive label being a result of the cognitive process of interpretation of the physiological response to a stimulus – 'physiological arousal'.

Even more close to my insight into the connection of emotions and language and thus more important in the context of this paper is J. Prinz's Embodied Appraisal theory of emotions. He traces his approach from W. James through A. Damasio and identifies it as a variation of the view that 'emotions are perceptions of patterned changes in the body. More informally, emotions are gut reactions' [Prinz, 2004, p. viii]. In other words, emotions are 'states within our somatosensory systems that register changes in our bodies' [Ibid., p. 58], and at the same time, these states represent relations between external states and our selves. More precisely, he offered to interpret environmental conditions to elicit an emotion as its object. There are two kinds of objects: a formal object, that is the property due to which an event causes emotion and a particular object, that is the event as it is. Here goes his instructive example with death and sadness. The death of a child can be a particular object of one's sadness, but it causes sadness in virtue of being a loss. Being a loss is the formal object of sadness. Emotions represent their formal objects, not their particular objects. 'An episode of sadness may concern any number of distinct particular objects, but the sadness in each episode represents loss' [Prinz, 2004, p. 62]. Therefore, one may say that a particular object elicits an emotion in virtue of its being an instance of the certain abstract object which is represented by the emotion mentioned above. This complex structure illustrates the type-oken relation and suggests a linguistics interpretation, for example the Gricean one, of a particular object as individual meaning whilst a formal object corresponds to the meaning of the sentence in general.

Interestingly, at the well-known picture in the Prinz's book illustrating the real and nominal content of emotions (see Figure 3.2, [Prinz, 2004, p. 69]), there are two quite predictable arrows indicating paths: one



from the Snake (particular object) to the Fear (emotion), the other from the Fear to the Danger (formal object); and one more extra arrow from the Snake to the Danger exemplifying Lazarus's core relational theme, that is just the meaning of corresponding emotion. Thus we again come across the sign-meaning relation by a different name.

Just as importantly it is the idea of associative learning that helps to establish the connection between emotions and corresponding perceptions. Some physiological changes acting as responses to stimuli are innate, and some are learned. Innate reactions correspond to basic emotions. In turn, they can be subdivided into sub-categories with an appropriate biological grounding in learned bodily responses.

In concluding a brief overview of cognitive conceptions of emotions I can't help but mention ideas of L. Barret. In [Adolphs, Mlodinow, Barrett, 2019, p. 1061] she succinctly and accurately describes her position. First, she explains the predictive coding approach to emotions as inferential: 'a brain constructs inferences – hypotheses about the causes of sensations – by remembering past events that are similar to present conditions'. And then introduces her hypothesis: 'a brain solves its inference problem by continually constructing *ad hoc* concepts to make sense of the cacophony arriving from its sensory organs', where 'ad hoc concept' means a representation of a category, that is a group of events or objects that are similar in some way. For example, 'the ad hoc fear concept is a functional state of fear that is preparing the animal to act and experience the world in a specific way' [Ibid.].

Traditionally, emotions and cognition have been viewed as independent or even opposite domains. It is interesting that language nevertheless always played the role of a specific intermediary, on the one hand, directly related to emotions ('emotional language', 'language of emotions', etc.), and on the other – as a sphere of implementation of various cognitive procedures, such as, for example, argument and inference. In recent years, the results of cognitive neuroscientific research have forced a new look at the relationship between emotions, cognition, and language, demonstrating the presence of a close intimate link between them. For example, L. Pessoa in [Pessoa, 2008] and [Pessoa, 2019] shows that brain structures, categorized as affective regions (take amygdala, for instance) are also involved in cognitive functions (attention, associative learning), and vice versa, some important 'cognitive' regions of the brain (like the prefrontal and parietal cortices) play an equally important role in affect. As a result, corresponding brain areas form networks that combine cognitive and affective functions. S.I. Greenspan and S. Shanker in [Greenspan, Shanker, 2009, p. 210] directly claim that 'emotions serve not just as a motivational factor but as the critical architect of language development'.

Surprisingly these ideas are quite consistent with the evolutionary view on language origin. It is well known that it was Darwin's thought that language had evolved via natural selection. In particular, he argued



that the evolution of such an important component of spoken language as vocal imitation was due to sexual selection. According to his assumption, a kind of musical protolanguage was used to express emotions during courtship or competition. These ideas were developed in the O. Jespersen hypothesis of a ‘holistic protolanguage’ [Jespersen, 1922] which is strictly non-compositional. Nowadays these ideas have morphed into A. Wray’s ‘holistic protolanguage model’ [Wray, 2005], and M. Arbib’s ‘the mirror system hypothesis’ [Arbib, 2012; 2016]. Similar to these vocal and gesture theories is so-called ‘Prosodic protolanguage theory’ (for detail, consider [Panksepp, 2009] and [Brown, 2017]), according to which ‘the emergence of emotional proto-musical communications in our species... may have set the stage... for the emergence of propositional language’ [Brown, 2017, p. 229].

To conclude our discussion of emotions in relation to language, I would like to name the most radical position, according to which emotions are our mother tongue. This position is defended by F.J. Ninivaggi and presented both in his book [Ninivaggi, 2017], and his post on the Internet [Ninivaggi, 2015]. He interprets emotion processing as taking place in a nonconscious language ‘that acts to organize internal states’. ‘Events in one’s inner world and outside environment activate the senses that send messages to the brain and its raw emotional center, the amygdala’ [Ninivaggi, 2017, p. 2]. More precisely, he identifies three stages (or time-ordered components) of this nonconscious process. In the first stage, the stimulus is regarded as important or insignificant, in the second it is more accurately assessed as dangerous (requiring avoidance) or attractive, and finally, in the third stage, ‘the stimulus is nonconsciously categorized into specificity a specific emotion’ [Ninivaggi, 2015].

However, all these conceptions, recognizing explicitly or indirectly the connection of emotions with language, face a serious problem: how did the transition from, say, a musical emotionally colored protolanguage occur to a modern language as a sign system? In fact, this question hides in itself several problems at once. Did natural language appear immediately in the form it exists today or was the original sign system not grammatically organized? Why did language emerge in humans and not in other species? Is it justified to distinguish between different stages in language evolution, singling out the formation of signs (in the Saussurean sense) as a separate stage, and the formation of the grammatical type-recursion structure (in the Chomskian sense) of expressions as another? For example, M. Tomasello assumes that symbols and grammar ‘may have involved different processes at different evolutionary times’ [Tomasello, 2003, p. 110], in other words, he claims ‘signs before grammar’. In contrast, N. Chomsky and R. Berwick [Chomsky, 2000; Bolhuis, Tattersall, Chomsky et al., 2014; Berwick, Chomsky, 2016] do not share the concept of step-by-step language formation. I would like to focus on Chomsky’s ideas in a little more detail because I think the ideas



of recursive computational nature of human language syntax and its connection with internal language are very important. They must be taken into account when considering the question of the evolution of language as a kind of ‘touchstone’, which must necessarily pass any conception of language.

In contrast to the ‘communicative’ approach to the evolution of language, Chomsky and Berwick believe that although externalized language may have been used for communication, its main function is to be a thought-expressing tool. The ‘Strong Minimalist Thesis’ they accept postulates the hierarchical syntactic structure to be the key distinguishing feature of language and the basic operation ‘Merge’ as the single generating procedure at its heart. It presupposes the mapping to the internal conceptual interface of thinking, and this way, it yields the so-called ‘language of thought’. Another important feature of this approach is expressed in its relation to the evolutionary process. According to Chomsky and Berwick, the faculty of language occurs almost simultaneously with the appearance of modern man, that is, in a very short (literally several hundred years) period of evolutionary time. In addition, since its inception, the language faculty has undergone virtually no significant evolutionary changes. All this allows them to suppose that the emergence of language was due to significant and transient genetic changes in human populations.

The language of thought is closely related to my understanding of the origin of language for two reasons. First, the recognition that thought precedes its linguistic expression is a prerequisite for recognizing its existence. This consideration is variously justified and formulated – as a *precedence* precursor of the theory of mind to language ability, or as a consequence of the assumption that the meaning of the linguistic message being sent will be available to the addressee – but the essence remains the same as it is formulated by J. Fodor and Z. Pylyshin: ‘we think that, in the course of linguistic communication, forms of speech inherit their semantic contents from the concepts and thoughts that they express, not vice versa’ [Fodor, Pylyshyn, 2015, p. 13]. Secondly, the grammatical structure of natural language appears to be inherited from the combinatorial structure of mental representations. In the full and expanded form, these ideas were presented in the Language of Thought (LOT) hypothesis by J. Fodor [Fodor, 1975]. He developed the ideas of Chomsky and promoted the conception of special mental language in which thinking is carried out. In turn, this idea is related to his ‘Representational Theory of Mind’, according to which thinking is considered as a computational process over mental representations. These representations form a system that is physically implemented in the brain and has a combinatorial syntax ‘mentalese’. According to his vision, elementary concepts form combinations, that is, thoughts. Interestingly, in his later work [Fodor, 2008], where he proposes LOT 2 as a development the ideas presented in LOT, Fodor clarifies the role of mental representations by means of the type-



token relationship: tokens (where tokens instantiate their abstract types) of mental processes ‘are “computations”; that is, causal chains of (typically inferential) operations on mental representations’ [Fodor, 2008, p. 5], what brings us back to the interpretation of the meaning of linguistic expressions discussed above in connection with Prinz’s theory of emotions.

Husserl’s phenomenology plays an important role in my approach, that is why I conclude this ‘theoretical’ section with brief philosophical observation. In his phenomenological project, Husserl among other themes explored the ways of knowledge formation. In particular, the primordial stages and layers of experience occupied him throughout the evolution of his thought. As he himself puts it, ‘every real thing whatsoever has, as an object of possible experience, its general “a priori”, a pre-knowledge that is an indeterminate generality but which remains identifiable as the same, as a type belonging *a priori* to a realm of *a priori* possibilities’ [Husserl, 1973a, p. 36]. This short fragment represents in a few words the core Husserlian idea of the passive synthesis within the process of sense-genesis which results in the so-called ‘field of sense’. This lowest cognitive base level is constructed with the help of immanent association. It presupposes pairing, that is either an immediate unconscious coincidence of the parts and moment of the perceived stimulus with model (ideal) object stored in memory, and thus identification of a new object as such and such, or on the contrary a conflict between two perceptions, their essential incompatibility and differentiation. ‘To intend the same objects with evidence in several perceptions means nothing else than that they, by essence, fit themselves into the unity of an identity-consciousness, i.e., that in their essence the possibility of such a unification is grounded *a priori*’ [Husserl, 1997, p. 24]. ‘Now, the two perceptions do not stand there before our self-posing eyes in an isolated way but as connected through a difference-consciousness which encompasses them, through the consciousness, “not the same”’ [Ibid., p. 25].

Though in his writings cited above Husserl addressed human consciousness he considered it as comprising hierarchically ordered layers of perceptual content, where the base layer formed in passive synthesis as aforesaid. This layer of animality (*das Tierische*) is, in his own words, ‘shared with the animal’ [Husserl, 1973b, p. 180] and forms a biological *a priori* ‘starting point’ for our instincts, ‘originary drives (eating, mating, etc.)’ appearing thus generative *a priori* [Husserl, 2013, p. 8].

4. Putting It All Together: My Theory

As I noted in the Introduction, my vision of the origin and evolution of language is not completely new and pioneering. In this section, I put together all of the above to present my understanding of how the language



evolved. In so doing, I use all the material from previous sections to some extent, so in most cases, I will not accompany the presentation with direct links: analogies are already quite transparent. Let's start with some general preliminary considerations.

First of all, I adhere to an evolutionary approach to the formation of language faculty.

Secondly, hereinafter I will use the terms 'type' and 'category' (as well as 'typification' and 'categorization') to refer to different structures (and related procedures). Typification means automatic, nonconscious attribution of a perceived stimulus to one of the built-in basic emotional types, such as 'danger', 'pleasure', 'fear' and so on, in accordance with the discussed above conceptions of basic emotions. For that matter, this sheds light on the connection noted earlier in the processing of abstract terms and the experience of affects. Emotional 'footprints' have remained in language since early evolutionary times, especially when it concerns abstract terms and concepts, as will be clear from the subsequent. Categorization, on the other hand, is a cognitive agent-driven procedure of assigning a stimulus to a category that is constructed by the agent. It should be stressed once more: unlike types, categories are not inherently embedded and embodied, they are constructed by a cognitive agent in the course of adaptation to the environment.

It is most convenient to organize further presentation by the way of example, using the modified 'Sender-Receiver framework' extended by the 'Observer'. As a first step, consider an animal (Animal #1) that perceives a certain stimulus (Stimulus #1). For example, it can be some dangerous animal, that is, a predator. The information received by the analyzer is processed and a multicomponent complex (Complex #1) is created as a result. It includes the following components. (1) The firing of certain neurons or neuronal ensembles, perhaps even sequences of neurons (ensembles) ordered in time. (2) Automatic typification of a perceived stimulus, for example, as dangerous (Type #1). (3) The parallel physical reaction to the stimulus, which may comprise myotic reflex, heartbeating, increase in arterial blood pressure and other manifestations of sympathetic nervous system activation in case of stress or danger. (4) Observable response to the same stimulus evidenced in behavior as immediate bodily reactions of 'fight-flight-or-freeze' discussed in the previous section.

This model contains, in my opinion, the potential for the subsequent formation of protosigns (in the sense of F. de Saussure and G. Frege) of the internal language. Specifically, Stimulus #1 turns out to be a referent, the corresponding type (Type # 1 in our example) plays the role of sense, and bodily reactions registered by Animal #1 serves for it as a protosign of the prospective internal language. When the grammatical structure of the internal language is concerned, it seems to me that the key evolutionary factor was the emergence of the ability to form new sub-categories, described by Husserl through similarity and difference in the course of



passive synthesis. The empirical material for this new faculty is supplied by the differences within the set of stimuli initially typified. Such differences, for example, may include variations in the degree of danger or edibility of objects. Subjectively significant for the animal, these differences serve as the basis for the formation of narrower categories, which allows diversifying its behavior.

Expanding the example with animals, it is instructive to add another character – Animal #2 that plays the role of an observer. For it, there are two simultaneously perceived stimuli: the same dangerous Stimulus #1 and its conspecific Animal #1 whose observable reactions thus turns into the second stimulus. That way, for the Animal #2, the situation becomes more complicated, it deals with two complexes at once: the Complex #1a, similar to the Complex #1, connected with the perception of the Stimulus #1, and a new Complex #2, which occurs during the perception of the Animal #1. As a result, and of course, at a higher stage of the evolutionary ladder, these two complexes run into one (again on the basis of the associations of similarity and difference, applied now to sequences of objects). This new complex allows for the emergence of an externalized protolanguage. It is especially noticeable if the situation is somewhat complicated. Let the second animal now has no visual contact with the Stimulus #1, and perceive as a stimulus only the visible changes in the reaction and behavior of the Animal #1. Through the perception of these reactions as a sign of danger, Animal #2 ‘guesses’ about the approaching threat. Thus the only stimulus, whose proceeding is supported by previous experience of perceiving two stimuli in the association, becomes a sign of external (externalized) language for the Animal #2. The referent of this sign is now an unspecified danger that threatens the first animal, and the new type (or in a more advanced case, category) of the Stimulus #2 becomes the sense of this sign.

Importantly, internal and external protolanguages develop together in mutual influence, but the priority of ‘primogeniture’ belongs to the internal one. In the future, an external language can and will be used for communication, but it emerges outside and before the communication process. In the proposed model, the link between external (registered) and internal (individual) bodily responses to the same stimulus is a link between internal and external languages. When forming signs of an external language, in fact, an objectification of sense takes place – senses-as-types themselves become the referents of these signs in acts of reflection, which naturally implies awareness. ‘Materialization’ of ideal sense-objects provides intersubjectivity of their perception, the possibility for re-activation of sense, thus the possibility for its transfer and, consequently, communication. Regarding the grammar, or compositional structure of external language, it emerges the same way as in case of internal language and reflects the structure of thoughts.



Pushing further analogy with modern natural language analysis, one may note that a sign of the internal language from our example is similar to a singular term that denotes exactly one object. A sign of an external language is more like a general term denoting a set of objects or a single ideal object (ideal singular) – a representative of this set. And this is again a particular case of type-token relation that emotional type bears to corresponding stimuli as its instances. Material sing instantiates, exemplifies ideal meaning-as-type.

5. Conclusion

To recap the above, my vision of (proto)language genesis presented in this paper is as follows. The ground level is formed by neurons (neuronal ensembles), ‘concept cells’, in R. Quiroga words [Quiroga, 2012; 2015]. They fire selectively in response to stimuli and sometimes are identified as building blocks of concept representations. This is the deepest, so to say, ‘profundal’ material for the language of thought that is hidden from the ordinary human consciousness, not to mention the pre-consciousness of living organisms. Since these neuronal activities are not accessible to a cognitive agent (only if the agent is not armed with special research equipment), they remain unconscious building blocks of thought. In the process of external stimuli perception, an internal language of a higher level is formed, in which internal reactions to the stimuli become available to the cognitive agent and give rise to concepts and thoughts which act as signs of this new language of thought. Finally, on the external level, the thoughts-as-signs of the internal language are objectified and become referents of material protosigns that are suitable for communication in the future.

In fact, the outline of my conceptions proposed above fits seamlessly into a large joint project that we have been developing in recent years. The main task of the project at this stage is to show the fruitfulness of a phenomenological philosophical approach to the study of consciousness and the brain. In this article, the emphasis was placed on attempting to offer an interpretation of the language based on the basic built-in emotional categories. Its justification required a detailed excursion into the fields of theoretical and empirical cognitive and neuroimaging research.

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