

# ACOUSTIC TACIT KNOWLEDGE. RECONSIDERING AND ENLARGING THE EPISTEMOLOGICAL PART OF THE THEORY OF TACIT KNOWLEDGE<sup>1</sup>

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## ABSTRACT

In this paper, the author has chosen two directions to reconsider and enlarge the theory of tacit knowledge. Primarily, he has identified features of sense organs that can influence and structure the perceptions and the emergence of tacit knowledge. These are as follows: levels of attention; a presence of the dichotomy of focal and distal attention, an openness of a sense organ to the external world, a continuity of incoming sense impressions; a magnitude of the sensory radius. On this basis, tacit knowledge can also be classified according to sense organs through which several forms emerge. The second direction of enlargement is represented by the emphasis given to acoustic tacit knowledge. The second part of the paper analyses all the five sense organs according to the dimensions mentioned. In addition to this, it deals with the differences between the visual and acoustic tacit knowledge in detail. The author differentiates four levels in acoustic attention of which three constitute the sources of acoustic tacit knowledge, whereas the fourth is that of focal and conscious attention. In the second part, the rule which highlights the link between the openness of sense organs and the differentiation of layers of attention within it will also be introduced. In the third part, two fundamental types of acoustic tacit knowledge are presented and defined: linguistic and musical tacit knowledge. Finally, the author discusses some consequences of the existence of acoustic tacit knowledge, and especially the linguistic, at the level of the philosophy of language.

**Keywords:** basic dichotomy of attention, tacit knowledge of the five sense organs, visual tacit knowledge, acoustic tacit knowledge, continuity of perception, the openness of the sense organ, the sensory radius of the sense organ, linguistic and musical tacit knowledge

<sup>1</sup> I have developed the concept of acoustic tacit knowledge in my Research Report "Das implizite Lernen und Wissen in den Prozessen des Komponierens" ["Tacit Learning and Knowledge in the Processes of Musical Composition"] (October 2014). The Report was written in the framework of the research project *Tacit Knowing in the Musical Composition Process*. This project was funded by the Jubiläumsfonds der Stadt Wien and FWF der Wissenschaftsfond Austria between November 2013 and October 2015. Here I would like to express my thanks to them for their support. The project was carried out by the Department of the Sociology of Music at the University of Music and Applied Arts in Vienna. I owe Prof. Tasos Zembylas, project leader many thanks for the invitation to his research group. My participation was also supported by the research project of the MTA-PE Networked Research Group for Innovation and Development Studies.

## INTRODUCTION

The Polanyian theory of tacit knowledge began to highlight an important role the structure and function of sense organs have in the formation of perceptions. It is a well-known fact from the history of the theory of tacit knowledge that Michael Polanyi relied significantly on the theory of Gestalt-psychology which introduced a new approach to human eyesight. Thus the German theory of eyesight, which appeared and flourished in the second and third decade of the 20<sup>th</sup> century, pre-determined important parts of the Polanyian theory. Nevertheless, a question can be raised as to whether the manner the other four sense organs structure perception differs from that of eyesight in a radical way. It seems that every sense organ has its own way to forward and structure sense impressions. As the sense of hearing has, like eyesight, a significant role in intellectual development and human activity, I will examine its features in detail, comparing them, at the same time, to those of eyesight, after having discussed the basic characteristics of all the five sense organs.

Interestingly, there is a small inconsistency between Polanyi's relying on the eyesight theory of Gestalt-psychology and his naming of a novel sort of knowledge, "tacit" knowledge because the adjective refers to the quality and position of certain acoustic sense impressions. The Polanyian name of the opposite to tacit knowledge is "explicit" knowledge, in which the adjective can signify the quality of a visual as well as an acoustic sense impression. Thus at least the adjective "explicit" may also harmonize with the definition of the new concept "acoustic tacit knowledge". The above-mentioned inconsistency has certainly contributed to a confusion of basic differences which exist between the abilities of sense organs concerning the reception and processing of sense impressions. From an examination of these differences and a reconsideration of the theory of tacit knowledge that is based on them, the shape of a new and enlarged theory of tacit knowledge can emerge. If the dichotomous structure of attention can significantly determine the means of perception in eyesight, perhaps there are other factors in the four remaining sense organs that are able to exert influence on the incoming sense impressions.

### I. THE DIMENSIONS OF THE DIFFERENCES BETWEEN HUMAN SENSE ORGANS

The dimensions of an analysis of sense organs are as follows: layers or levels of attention; a presence of the dichotomous structure of attention, that is, the possibility of focal and distal attention, the presence of which minimally guarantees the accumulation of tacit knowledge; an openness of a sense organ towards the outside world or a possibility to close the sense organ; a continuity of the incom-

ing sense impressions; a measurement of sensory radiuses. In his main oeuvres<sup>2</sup>, Polanyi discusses an important role of two levels of attention in the emergence of tacit knowledge and demonstrates the co-occurrence of the focal and distal attention in visual cognition processes. A question can be raised, however, whether this dichotomy is dominant in every sense organ. In addition, the openness of a sense organ towards the outside world may be of importance because its duration exerts an influence not only on the accumulation process of tacit knowledge, but also on its structure. A sense organ which is continuously exposed to the effects of the external world receives many more impulses producing tacit knowledge than a closed one. The continuity of each impulse also has effects on structuring tacit knowledge. The radius of the sensibility of a sense organ must also be taken into consideration because the greater this radius, the more the structure of the obtained tacit knowledge is differentiated and reflects the features of the environment of perception.

As it will be seen in a detailed description and analysis, the structure of attention is either simpler or more complex in other sense organs than in eyesight, and consequently, a dichotomous structure of visual attention cannot be considered as a general model. In spite of this, some variant of the dichotomy of focal and distal attention is present in every sense organ or can be developed through training, but there can also be other levels or layers, especially in the organ of hearing.

## II. THE DIFFERENCES BETWEEN SENSE ORGANS ACCORDING TO THE MAIN DIMENSIONS

In the tactile organ, that is, on the surface of the skin, different (at least three) levels of attention can emerge. One of them may be entirely tacit. If someone focuses on the function of another sense organ and its sense impressions, one can completely ignore tactile impressions for some considerable time. Nevertheless, the attention can also be focused on a particular part of the skin surface, whereas perceptions coming from other parts receive secondary attention or they are entirely unconscious. For instance, if one screws in a screw by hand, one feels its surface with focal attention through one's fingers and the armrest with distal attention, and normally does not feel the other parts of skin (for instance the skin on his or her feet) consciously. The tactile organ is completely open to the external world, although its sensibility can be reduced by clothing, special tools or illness. This sense organ cannot be isolated from the objects of the external world. Consequently, it operates continuously because the human body always touches the surface of one or more objects due to gravitation. As for the continuity of perception, tactile organ resembles the organ of hearing and the organ of smell. The radius of perception of the tactile organ is

<sup>2</sup> *Personal Knowledge. Towards a post-critical philosophy*. London: Routledge, 1958, and *The Tacit Dimension*. Garden City, N. Y.: Doubleday, 1966.

very limited, especially compared to other organs. Even a perception of heat and cold is limited to a distance of a few meters.

In the case of the organ of taste, the differentiation of levels of attention is quite difficult for the average person. As in the case of the organ of smell, there are, however, people with a well-trained organ of taste, for instance cooks, who are able to filter out the special flavour of a spice or some food. That means that they can divide their attention, waiting for the flavour searched for with focal attention and, at the same time, perceiving the other flavours through their distal attention. Knowledge of the position and function of the taste buds can significantly contribute to the conscious use of the tongue, and thus to the development of focal attention in tasting.

The sense of taste is a well-closed sense organ towards the external world. There can be flavours, however, coming directly from the body, which cannot be excluded unlike the effects of the external world. The sense of taste of a little child is more open because she or he tries to learn different flavours according to a biological program. While eating and drinking, one can regulate the schedule of sense impressions. Thus they come and go quickly and hence the flavours as we experience them also change quickly. Flavours can also change in another way as it is impossible to maintain their continuity and the new ones begin to change and terminate quite quickly in the mouth due to the digestive effects of saliva. The sensory radius of the organ of taste is the most limited compared to that of the other sense organs.

The organ of smell cannot differentiate easily between sense impressions for instance, those of fragrances. The differentiation of levels of attention in this sense organ is very difficult for the average person. There are, however, well-trained people, for instance designers of perfumes and scents, who are able to filter out even some special components of a perfume. Similarly, experts in wines are also able to detect the original components of a wine using their organ of smell. This means that these people can divide their attention, waiting for the scent they are searching for and perceiving the other scent at the same time through their distal attention.

The organ of smell is continuously open to the effects of the external world. One can, however, close this organ, that is, his nose with his fingers quite efficaciously. Due to the continuous respiration, one always controls the quality of air, but because of the rhythm of respiration, the organ of smell functions according to a tempo and, consequently, it can receive discontinuous sense impressions only. A good sense of smell requires a strong inhalation through the nose at least once, and comes to a close with it. Finally, the sensory radius of the organ of smell is fairly limited, and depends significantly on the speed and direction of air movements.

According to the developmental sequence, the next sense organ to be discussed would be the organ of hearing but before that I will discuss the eyesight because in the following sections of this paper I will deal with the analysis of hearing in detail.

The function of the dichotomy of focal and distal attention in the organ of sight is well known thanks to Polanyi's detailed analysis in his book *Personal Knowledge*. According to him, tacit knowledge comes into being through the distal attention

during the perception process. As I have already expounded earlier, this dichotomy of focal and distal attention of the organ of sight, however, cannot be considered as a general model for every sense organ.

The openness of the organ of sight is limited, especially compared to the tactile organ, the organ of smell or the organ of hearing. Mainly the last is far more exposed to the effects of the external world than the organ of eyesight because it can be closed during the day, and it must be closed from time to time during daytime due to the blinking. It must be closed during sleep as well. In eyesight, a conscious decision or an automatism, which produces the closing of the eyelid, is enough to break the continuity of sense impressions. Similarly, the choice of the object of perception has a far greater scope for action in the organ of sight than in the process of hearing. To sum up, the continuity of the incoming sense impressions can be interrupted by a conscious decision, a physiological automatism or a sleep and thus visual perception is not at all continuous. Finally, the organ of sight has the greatest sensory radius of the human sense organs. This ability also accounts for the outstanding importance of visual tacit knowledge.

In the organ of hearing, there are more than two layers or levels of attention, which also exert a great influence on the structure of acoustic tacit knowledge. In addition to this, the dichotomy of focal and distal attention can also be found here. For instance, in a friendly gathering, somebody pays focal attention to the voice of speaker, whilst paying distal attention to the noises made by other members. In addition to this dichotomy, however, one also perceives background noises coming from the street, for instance. Thus there is a structure consisting of at least three levels of perception. If we take the fact that the organ of hearing gives preference to human voices into consideration, a four-level structure can also be observed. This structure is able to separate the above-mentioned two levels of conversation in a gathering, the third level, of some unclear voices coming from the conversation of other people in the far background, and finally, mechanical noises caused by machinery in the background, too. During an acoustic observation, the basic background noises can turn into “alive” or “tacit” for a time, depending on the choice of the object of focal and distal acoustic attention. Whereas visual perceptions are rather selected, the choice of acoustic perceptions is less intentional, and one should make efforts, for example, to retreat quickly or to find a soundproof room, to get rid of the unpleasant or undesirable source of noise.

The openness of the organ of hearing towards the external world is complete as it is impossible to close it. Practically from the moment of birth until death, the hearing process of an individual is continuous, including during the periods of sleep. For instance, hypnopaedic experiences demonstrate that people are also able to learn a foreign language whilst asleep. Due to its being exposed to the effects of the external world in this way, the organ of hearing continuously produces acoustic tacit knowledge on the basis of the incoming acoustic sense impressions. So it seems that the structure of acoustic tacit knowledge differs significantly from

that of visual tacit knowledge, because the four levels of acoustic attention enables a three-category division of acoustic tacit knowledge (the explicit acoustic knowledge constitutes the fourth category).

The sensory radius of the organ of hearing is longer than that of the other sense organs, except the visual. People can focus on voices by turning their ear towards them but they can also focus on them by filtering out background voice, regardless of spatial resource. Focussing on the sources of the voice from several points of space, the organ of hearing is also able to contribute to the reconstruction and zoning of space around itself. Due to the four levels of acoustic attention, the mapping of space around an individual can be quite differentiated. Particularly blind people must exploit to the full capacity this four-level structure of acoustic attention.

On the basis of the detailed analysis of the five sense organs, a rule takes shape that highlights the link between the openness of sense organ and the differentiation of attention within it. The more a sense organ is exposed to the continuous effects of the external world, the more the attention within it tends to split into different levels. Regarding the five human sense organs, the two opposite poles are, on the one hand, the organ of hearing which has four levels, and, on the other, the organ of taste in which the dichotomy of distal and focal attention can be developed only with a long training.

### III. TWO IMPORTANT TYPES OF ACOUSTIC TACIT KNOWLEDGE: THE LINGUISTIC AND THE MUSICAL

#### *Linguistic tacit knowledge*

From several types of acoustic tacit knowledge, I would like to focus on two: linguistic and musical tacit knowledge. The concept of linguistic tacit knowledge also includes the tacit knowledge relating to mother tongue, which has an outstanding role in the formation of the human mind. From birth onward, children immediately begin to learn their mother tongue. This learning is not voluntary but it is compelling and coercive. Six-year old children can already speak their mother tongue very well whereas they do not know its rules consciously. The rules, however, are in their heads in an unconscious, or better to say, in a tacit way. In the course of their life, children or adults are often exposed to several kinds of speech in their environment. From this it follows that, in practice, both a child and an adult continue to enrich their tacit knowledge of mother tongue or their chosen learned languages throughout their lifetimes.

Unconscious hearing during sleep can be defined as the first level of acoustic attention: for instance when people speak beside the hearer. Experiments with hypnopaedic learning (language learning during sleep) demonstrated that this way of learning is efficacious. Moreover, it gives a better result in the pronunciation of foreign words than conscious learning (Ördögh 1980). Language learning during

sleep is based on separate physiological processes as compared to other levels of attention. The acoustic sense impressions coming from a physical source that become entirely unconscious during a daytime activity also belong to this first level of acoustic attention.

The second level is that of the background hearing whilst awake that takes place even as the individual is working, playing or doing something else, if there is a source of speech around him or her. The organ of hearing gives preference human voices to physical ones even if only a secondary or tertiary attention is paid to them.

The third level of acoustic attention is that of distal hearing as a part of the dichotomous structure of acoustic attention in conscious communication – for instance when an individual is speaking to somebody and pays distal attention to the listener's acoustic reactions. The same distal attention works when individuals are hearing their fellow and, in addition to the focal attention following the main content of the fellow's speech, also pays distal attention to her or his emphasis. The fact of the three levels of non-focal or distal acoustic attention highlights that the above-mentioned life-long increase in linguistic tacit knowledge can take place at several levels.

The fourth level is that of the focal acoustic attention itself when an individual – for instance – expressly pays attention to the content or main information of somebody's speech. Unconscious and semi-conscious acoustic learning, that is, language learning at the first three levels is far more dominant compared to that at the fourth level. From the existence of these four layers, a different structure of the linguistic tacit knowledge takes shape as in the case of the visual. From a psychological and philosophical point of view, it is very important that both the conscious, explicit knowledge of the mother tongue and the three other levels of tacit knowledge of the mother tongue exert a significant influence on human thinking.

### *Musical tacit knowledge*

The concept of musical tacit knowledge has a narrow as well as a broad meaning. The narrow meaning refers only to the tacit knowledge necessary to play an instrument and to perform musically. The broader relates to all kinds of tacit knowledge attached to music, including those which constitute the elements of a new, practice-oriented classification of tacit knowledge: tool-centred or instrument-centred, environment-centred, personal relation-centred and social institution-centred musical tacit knowledge.<sup>3</sup> The broader concept also includes additional elements, such as, for instance, tacit knowledge gained by a listener to music, which comes from his or her experience in a concert hall, or stemming from a performance by an orchestra.

At a glance, for instance, the musical counterpoint as basic structure in many pieces of music corresponds to the basic dichotomy which characterizes mainly the

<sup>3</sup> See my paper *A Practice-oriented Classification of Tacit Knowledge for Research Into Creativity and Innovation* that is published in *Polanyiana* together with this paper.

attention of the organs of sight and hearing. There is a solo played on an instrument that is followed by the focal attention of listeners, and this is accompanied by several other instruments, that is, by an orchestra. Distal attention is oriented towards the accompaniment. This real structure, however, can also hide away a more complex structure which contains a third and fourth level of attention as well that is pushed into the background whilst listening to music.

#### IV. THE PHILOSOPHICAL CONSEQUENCES OF THE EXISTENCE OF ACOUSTIC TACIT KNOWLEDGE

From a philosophical point of view, the significant differences between the structures of attention in the organ of hearing and organ of eyesight that also cause great variation in the field of the classification of tacit knowledge, can have very far-reaching consequences in the theories of human cognition. It seems to be necessary to re-think the relation between theories based on the attention structure of eyesight and epistemological models proposed by different trends in the philosophy of language. If due to the nature of acoustic tacit knowledge, language (practically mother tongue) has an outstanding role in structuring human thinking, then the layers and integration of knowledge do not only take place at two levels either because a continuous acoustic tacit learning of mother tongue re-produces, supplements and transforms linguistic tacit knowledge. The continuity of tacit learning of mother tongue also involves people having a significant knowledge not only in its unused parts but also its history and development during their lifetime. Thus, a historical way of looking comes into being and develops tacitly not only due to political, historical and sociological experience and knowledge but also via linguistic tacit knowledge.

Research into the nature of acoustic and especially linguistic tacit knowledge opens a new path towards new examinations at the level of the philosophy of language. The concept of linguistic tacit knowledge also sets Wittgenstein's second philosophy of language in a new light, which has recently been connected to the Polanyian variant of the theory of tacit knowledge.<sup>4</sup> The continuous tacit learning of mother tongue that also creates and maintains a historical way of looking into the usage of language, and its consequences harmonize with Wittgenstein's references in his *Philosophical Investigations* to the role of historical antecedents as the support of certainty.

<sup>4</sup> Schneider, H. J. Können, Wissen, Zuschreibung, Begriffliche Vorschläge im Ausgang von Wittgenstein. In: Loenhoff, J. (Hrsg.) 2012. *Implizites Wissen*, Göttingen: Velbrück Wissenschaft, Weilerswist, 67-89.



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