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The World of the Senses

The five human senses are a person's window on the world. Sight, hearing, smell, taste and touch – the senses join forces to deliver a precise, variegated and constantly fresh view of one's surroundings. In doing so, the sense organs respond to stimuli that are first sorted and interpreted by the brain, and which then coalesce into an individual perception. The processing of sense impressions is therefore a highly subjective process, one that is also strongly influenced by our cultural background and by social and technological changes. What enables us to recognise beauty in art, music or design? What tastes good? Which smells do we find pleasant – and how do these sensations actually vary from person to person? This four-part interdisciplinary series delves into the world of the senses, covering a wide range of topics from the latest developments in brain research, through to art, history or education, from a baby's initial sensory development, to the receding of the senses during illness or in old age.

01 Seeing – Decoding Visual Chaos

The first programme is devoted to sight, our most important sense. The eye delivers 80 percent of the information we need to perceive the world, and it takes precedence over all other senses. The invention of the eye was a stroke of genius by nature. An organism that can see has a distinct advantage over those without sight. The eye can recognise prey, or an enemy, from a distance. And if all the opponent can do is taste, smell and touch, it's clearly too late to get away. But not all eyes are the same – the eagle, for example, needs better eyes than the mole. The sight organ has to be fine-tuned to meet the demands of the owner's environment.

02 Hearing – Signals from Outside

We can't close our ears to the world, our sense of hearing is active and ready to process acoustic stimuli around the clock, even when we're asleep. But decoding the world with open ears is not taken for granted in an era in which sight has apparently asserted its dominance in human perception. The sense of hearing begins functioning in the mother's womb: the ears of the unborn child can perceive sounds from the 20th week of pregnancy, and recognise the mother's voice. Once the child has been born, it quickly realises the potential of its own voice. The child's sense of hearing plays a decisive role in social interaction, as it is calibrated at exactly the frequency and rhythm of speech.

03 Smelling and Tasting – The Sensuality Factor

The scent of another person determines whether we like him, or whether we can't stand him. Although scientists have so far drawn a blank in research into human pheromones, equivalent to those present in the animal world, we nevertheless also use our noses to seek out our partners. If we lose our sense of smell, then we lack a direct connection to the brain. This can lead to depression, and cause "sexual communication" problems. Our noses have to deal with thousands of different scent stimuli every day. The importance of smell is often underestimated in perception, which is mostly dominated by the eye. Cell physiologist Hanns Hatt and his team at the Ruhr University in Bochum have succeeded in solving a mystery. Up to now, scientists have been unable to explain the basic principles of recognition and recollection of around 10,000 different smells.

04 Feeling – Touching is Life

Covering an area measuring two square meters, the skin is generally recognized as our largest sense organ. Pressure, temperature and pain can stimulate its sensory cells. These three stimuli are then combined in the brain to form a uniform "feeling". Skin enables us to perceive touch, pressure, tension and temperature fluctuations. We can perceive tactile stimuli with the entire surface of our bodies. Sensors report changes in temperature and painful experiences, and humans experience pleasure and discomfort. The sense of touch enables us to make contact with our environment, and investigate it further.