A very warm welcome to you dear students to this module on developmental psychology. the paper code is PSD 105.

The title of the unit is physical development and today we will be doing infancy: development of senses.

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By the end of this session or during the session, we will be studying the different sensory perceptions. Will study vision, hearing, sense of pain, sense of touch, smell, taste and intermodal perception.

By the end of this module, you should be able to differentiate between sensation and perception. You will also be able to describe visual perception in infancy and toddlerhood. You will be able to examine the development of other senses, that is hearing touch and pain, besides smell and taste both in infancy and toddlerhood.

So, let's start.

Sensation and perception.

Now, sensation occurs when information interacts with sensory receptors, that is, the eyes, ears, tongue, nostrils and skin. The sensation of hearing, for example, occurs when waves of pulsating air are collected by the outer ear and transmitted through the bones of the inner ear to the auditory nerve. The sensation of vision occurs as rays of light contact the eyes, become focused on the retina, and are transmitted by the optic nerve to the visual centres of the brain.

Perception, on the other hand is the interpretation of what is sensed. Now, the air waves that contact the ears might be interpreted as noise or as musical sounds. The physical energy transmitted to the retina of the eye might be interpreted as a particular colour, pattern, or shape, depending on how it is perceived.

Some important changes in visual perception with age can be traced to differences in how the eye itself functions over time. For example, changes in eye function influence how clearly, we can see an object, whether we can differentiate its colours, at what distance, and in what light.

We shall now see Visual Acuity: A new-born perceives a world with some order. At birth, the nerves and muscles and lens of the eye are still developing. As a result, new-borns cannot see small things that are far away. The new-born's vision is estimated to be 20/240 on the well-known Snellen chart used for eye examinations, which means that an object 20 feet away is only as clear to the new-born as it would be if it were 240 feet away from an adult with normal vision (20/20). By 6 months of age, though, on average vision is 20/40.

Infants show an interest in human faces soon after birth. Infants spend more time looking at their mother's face than a stranger's face as early as 12 hours after being born. By 3 months of age, infants match voices to faces, distinguish between male and female faces, and discriminate between faces of their own ethnic group and those of other ethnic groups.

As infants develop, they change the way they gather information from the visual world, including human faces. From 3 to 9 months of age, infants gradually began focusing their attention more on the faces of the characters in the animated film and less on salient background stimuli.

Pattern Perception. This is called a looking chamber, developed by Robert Fantz in 1963. Now this revealed that even 2- to 3-week-old infants prefer to look at patterned displays rather than nonpatterned displays. For example, they prefer to look at a normal human face rather than one with scrambled features, and they prefer to look at a bull's-eye target or black-and white stripes rather than a plain circle.

The infant's colour vision also improves over time. By 8 weeks, and possibly as early as 4 weeks, infants can discriminate between some colours. By 4 months of age, they have colour preferences that mirror those of adults. In some cases, preferring saturated

colours such as royal blue over pale blue. However, experience, is also necessary for vision to develop normally.

Some perceptual accomplishments are especially intriguing because they indicate that the infant's perception goes beyond the information provided by the senses. This is the case in perceptual constancy, in which sensory stimulation is changing but perception of the physical world remains constant. If infants did not develop perceptual constancy, each time they saw an object at a different distance or in a different orientation, they would perceive it as a different object. Thus, the development of perceptual constancy allows infants to perceive their world as stable. Two types of perceptual constancy are size constancy and shape constancy.

Size constancy is the recognition that an object remains the same even though the retinal image of the object changes. Researchers have found that babies as young as 3 months of age show size constancy. However, at 3 months of age, this ability is not full-blown. It continues to develop until 10 or 11 years of age.

Shape constancy is the recognition that an object remains the same shape even though its orientation to us changes. 3-month-old infants however, do not have shape constancy for irregularly shaped objects, such as tilted planes.

In the first two months of postnatal development, infants don't perceive occluded objects as complete, instead only perceiving what is visible. Beginning at about 2 months of age, infants develop the ability to perceive that occluded objects are whole.

Infants develop the ability to track briefly occluded moving objects at about 3 to 5 months of age. Learning, experience and self-directed exploration via eye movement play key roles in the development of perceptual completion in infants.

This is a picture of depth perception that was developed by Eleanor Gibson and Richard Walker in 1960. They constructed a miniature cliff with a drop off that was covered by glass. And they placed infants on the edge of the cliff, and had their mothers coax them

to crawl onto the glass. Most infants could not crawl onto the glass, choosing to remain on the shallow side, an indication that they could perceive their perceived depth.

Two- to 4-month-old infants show differences in heart rate when they are placed directly on the deep side of the visual cliff instead of on the shallow side.

Other senses: During the last two months of pregnancy, the fetus can hear sounds such as the mother's voice, music etc. An fMRI study assessed fetal brain response to auditory stimuli, confirming that the fetus can hear at 33 to 34 weeks of gestation.

Changes in hearing take place during infancy involve perception of a sound's loudness, pitch, and localization:

Immediately after birth, infants cannot hear as well as adults can; Infants are also less sensitive to the pitch of a sound than adults are. Which is the perception of the frequency of a sound. Infants are less sensitive to low-pitched sounds and are more likely to hear high-pitched sounds. By 2 years of age, infants have considerably improved their ability to distinguish between sounds with different pitches.

Even new-borns can determine the general location from which a sound is coming, but by 6 months of age, they are more proficient at *localizing* sounds or detecting their origins. Their ability to localize sounds continues to improve during the second year.

Touch and pain: New-borns do respond to touch. A touch to the cheek produces a turning of the head; a touch to the lips produces sucking movements. New-borns can also feel pain. Circumcision is usually performed on young boys about the third day after birth. An investigation by Megan Gunnar and her colleagues in 1987 found that new-born infant males cried intensely during circumcision. Circumcised infants also display amazing resiliency. Within several minutes after the surgery, they can nurse and interact in a normal manner with their mothers.

Smell: New-borns can differentiate odors, they like the way vanilla and strawberry smell but do not like the way rotten eggs and fish smell. Even 6-day-old infants who were

breast fed showed a clear preference for smelling their mother's breast pad rather than a clean breast pad.

New-borns are very sensitive to taste and that is present even before birth. At only 2 hours of age, babies made different facial expressions when they tasted sweet, sour, and bitter solutions. At about 4 months of age, infants begin to prefer salty tastes, which they did not like earlier.

Intermodal perception involves integrating information from two or more sensory modalities, such as vision and hearing. and this exists even in new-borns. For example, new-borns turn their eyes and their head toward the sound of a voice or rattle when the sound is maintained for several seconds. but the new-born can localize a sound and look at an object only in a crude way.

3 months old looked more at their father or their mother when they heard either the mother or the father's voice.

In the first six months, infants have difficulty connecting sensory input from different modes. In the second half of the first year, they show an increased ability to make this connection mentally.

For this module you can refer to these two books.

I hope you enjoyed this model and I wish you all the very best.

Thank you.