

The major function of human hand psychology essay



The major function of human hand is to manipulate object to accomplish a goal. The ability of a human hand to assure a myriad of position and to apply only the precise amount of pressure necessary to hold an object is owed to the mobility and stability supplied by the skeleton, to the power of the muscle, and to the remarkable degree of sensory feedback from the nerves. The sensory feedback is used to assess the shape, size, texture and weight of the object. The feedback used in both grasping and lifting of an object is dependent on the brain interpreting correctly, what is seen on the hand responding appropriately.

ANATOMY OF THE HAND

The hand consists of osseous structures, joints, musculo-tendinous units, nerve supply and blood vessels.

The osseous structure consists of 8 carpal bones. The proximal row consists of scapoid, lunate, trapezium and pisiform. It articulates with radius and ulna. The distal carpal bones trapezoid, capitate, hamate articulate with 5 Metacarpals.

The two phalanges complete the thumb unit and 3 phalanges each comprise the index, middle, ring and little finger. There are 24 bones with the intricate arrangement of supportive ligament and contractile musculo-tendinous unit that are arranged to provide both mobility and stability to the various joints of the hand.

The muscles acting on the hand can be grouped as extrinsic-when the muscle belly are on the medial side of the upper [art of the forearm-pronator teres, flexor carpi radialis, flexor Carpi ulnaris, Palmaris longus, <https://assignbuster.com/the-major-function-of-human-hand-psychology-essay/>

flexors digitorum superficialis, flexor digitorum profundus, flexor pollicis longus and intrinsic- when the muscle originated distal to the wrist joint and divided into thenar and hypothenar muscles. The median, ulnar and radial nerves are responsible for the sensory and motor transmission to the forearm, wrist and hand.

When we observe the well organized movements of a person reaching, grasping, and manipulating an object, the fact that these actions are under the control of different motor pathway is not apparent. In the motor development of infant, controlled reach is achieved before, refined pincer grasp or manipulation, older system controlling the shoulder mature first, and the comparatively newer system controlling the hand develops later.

The motor neurons in the ventral horn of the spinal cord are not randomly distributed but are clustered into cell columns- a median motor for the trunk, shoulder girdle and hip. A lateral column contains a motor neuron for the distal extremities. In the dual motor system one system serving postural and axial movement and the other serving the muscles of the distal extremities and providing speed and dexterity of the movement.

Manipulation task heavily depend on sensory guidance from receptors in the hand. Vision guides the hand in the space, prepare the hand for grasp and can help to determine the hand be critical for refined, controlled movements. The ability to produce individual finger movements absolutely depends on the pyramidal tracts and primary motor cortex. Children with poor hand skill often avoid or are so poor at fine motor task.

NORMAL DEVELOPMENT OF HAND FUNCTION

The primitive grasp reflex of the first 2-3 months disappears before the voluntary grasp begins. At 4 weeks, the hands are still predominantly closed but by 12 weeks they mostly open. At this stage the baby looks at an object as if he would like to grasp it. He will hold an object placed in the hand. At 16 weeks his hand come together as he plays and pulls his dress . The tries to reach for an object. At 20 weeks, he can grasp an object voluntarily. There after his grasp develops to the ulnar grasp and to the radial grasp and to the finger thumb grasp the last 3 months. In the first 6 months the cube is grasped in the palm of the hand on the ulnar side.

From 32-40 weeks the index finger usually with the help of the ring and little finger posses the cube against the lower part of the thumb and between 40-50 weeks the cube is grasped between the volar pads of the finger tips and the distal volar pad of the thumb. At 6 months he transfer objects from hand to hand as he can now chew, he can feed himself with a biscuit. He plays with his toes in the supine position. He loves to play with paper every thing goes to the mouth. By 40 week he can pick up a small object, brining finger and thumb together. He goes for object with his index finger. By 44 week he starts pulling object in and out of a basket. Mouthing is stopped at 1 year, by 3 years he can build a tower with cubes.

By 2-2. 5 year he use palm to finger translations and simple rotation with some objects, although these skills may not be seen with stabilization of other object in the hand simultaneously. B y3-3. 5 year of age child begin to use theft and complex rotation with easy to handle objects with 3. 5 -5. 5 year of age child develop skills in rotating a marker and shifting it into an <https://assignbuster.com/the-major-function-of-human-hand-psychology-essay/>

optimal position for coloring and writing. Combination of in-hand manipulation skills that must be used with in an activity, such as palm to finger translations with stabilization followed by complex rotation with stabilization is used by 6 and 7 year.

AGE

GRASP

RELEASE

BIMANUAL SKILLS

Neonate

Traction response

Avoiding reaction: hand opens with tactile stimulation to hand's dorsum.

Smooth, alternating arm movements; reflexive arm response to proprioceptive and tactile input.

1 month

Grasp reflex: local grasp reaction, followed by traction response.

Avoiding reaction continues.

Asymmetry of arm movements; reflexive arm responses to proprioceptive and tactile input.

2 month

Grasp reflex: catch and holding phases

3 month

Instinctive avoiding responses; pronation and adduction from stimulation on ulnar side, supination, abduction from stimulus on radial side.

Hand held together on chest usually without object, symmetric, simultaneous arm movement.

4 month

True grasp reflex; primitive squeeze of finger; diminished traction response.

Instinctive avoiding reaction continues; variety of hand movement used to avoid touch contact.

Object held with both hands in midline; symmetric midline movements.

5 month

Instinctive grasp, squeeze grasp, grasp for tactile stimulus, adjust hand on object.

Release involuntary or accidentally.

Two-hand reach with unilateral prehension, object transfer, hand to hand, bilateral holding and fingering.

6 month

Palmar grasp, pronated hand and flexion of all fingers, adjust hand using visual and tactile information.

Object accidentally released in mouthing or bimanual play.

Simultaneous symmetric bilateral approach with bimanual or unilateral prehension.

7 month

Radial palmar grasp, superior palmar grasp, differentiation of ulnar and radial side stable, radial finger holding object.

Purposeful release, transfer of objects from one hand to other, release against a resisting surface.

Successive bilateral approach with unilateral prehension, bilateral object manipulation associated bimanual movement.

8 month

Radial digital grasp, inferior fore finger grasp, object held proximal to finger pads, ulnar side stable and radial finger hold object.

Purposeful release with assistance and resistance against a surface.

9 month

Scissor grasp; able to hold small object

Object rotation by transferring it hand to hand; plays with 2 toys; one in each hand, banging of symmetric arm movement.

10 month

Forefinger grasp: tip of thumb and fore finger used in grasp; grasping accuracy without stabilization

Active release; hinging of object by combining elbow, wrist, finger extension, object release above surface

11 month

Complementary and cooperative bimanual movement.

12 month

Superior finer grasp; tip of thumb and fore finger used in grasp grasping accuracy with out stabilization

Beginning of controlled release, remains imcrease

Coordinated, asymmetric movement; one hand stabilizes and one hand manipulates.

15 month

Deft and preases grasp; variety of grasp used

Controlled increase, increasing control when releasing

Beginning of two hand tool use, continues

pattern of one hand stabilization and one manipulation

18 month

Increasing dissociation, strength and perception enable child to use tools and manipulate objects

Controlled release in acting accuracy with limited precision of placement tends to extend finger all at one time

Asymmetric, dissociated bimanual skills, blended stability and mobility alternating sequences of two hand movement

24 month

Greater precision and control of release, adjustment of hand opening according to object size and shape

Increasing competence in two-hand tool use; increasing complexity in movement patterns; cooperation of two hand

REACH

As the baby shows increasing dissociation of two body sides during movement, unilateral reaching begins. Abduction and internal rotation of the shoulder are less prominent, but the hand is usually move to open that are necessary for the size of the object. As scapular control and trunk stability mature, baby being to use shoulder flexion, slight external rotation and slight wrist extension during reaching. Movement and stabilization of the arm and hand for the purpose of contacting object with the hand.

GRASP

Attainment of object with hand

HOOK GRASP: It is used when the strength of grasp must be maintained to carry objects. In hook grasp, the transverse metacarpal arch is flat, fingers are adducted with flexion at the IP joint, flexion or extensions occur at the MCP joint.

POWER GRASP: It is often used to control tools or other objects. Maximum power is obtained with horizontal placement of the object in the palm and full thumb and finger flexion.

LATERAL PINCH: It is used to exert power on or with a small object. This pattern is characterized by partial thumb adduction, MCP extension and IP flexion. The index finger is held in slight flexion. Pad of thumb is placed against radial side of index finger at or the dip joint.

TIP-TIP PINCH: It is the opposition of the thumb and index finger tip so that a circle is formed. All the joints of finger and thumb are partially flexed.

SPHERICAL GRASP: Spherical grasp involves wrist extension, finger abduction and even flexion at the MCP and IP joint. The hypothenar eminence lifts to assist the cupping of hand for the control of the object.

CYLINDRICAL GRASP: In cylindrical grasp, transverse arch is flattened to allow the finger to hold against the object. The fingers are only slightly abducted and IP and MCP joint flexion is graded according to the size of the object.

PALMAR GRASP: It is used by 24 week old infant. The palmar grasp is characterized by a pronated hand and flexion of all fingers around the object. The thumb may slide around the object passively rather than actively holding it. The pressure used to maintain grasp of the object pressing into the palmar surface of the hand. As the pressure of the grasp moves to the radial side of the hand, the thumb becomes active.

RADIAL PALMAR GRASP: It is used by 28 week old infant. The radial finger and thumb press the cube against the palm . Therefore when held in a supinated hand, the object can be brought to and put into the mouth. The radial palmar grasp is a hallmark in grasp maturation because the infant now differentiate the sides of the hand, using the ulnar side to provide stability for the grasping movement and the radial side to prehend and hold the object.

RADIAL DIGITAL GRASP: It is used by 32-36 old infant. At this time the infant can prehend a small object between the radial fingers and thumb. With the object held distally in the finger, the infant can adjust the object within the hand and as a result can use the object for various purposes while holding it.

SCISSOR GRASP: It is used by 36 week old infant. It is defined as prehension of a small object between the thumb and lateral border of the index finger following a raking movement of the finger. The hand is stabilized on a surface during this grasp, and the ulnar fingers are flexed to provide stability of the thumb and radial finger movement.

INFERIOR PINCER GRASP: It is obtained by 40 week. This is a fingertip grasp in which the infant stabilizes the forearm on the table as the base while <https://assignbuster.com/the-major-function-of-human-hand-psychology-essay/>

grasping the cube. The fingers that prehend the small object are more extended than flexed.

SUPERIOR PINCER GRASP: It is obtained by 52-56 week. The infant prehends and hold the object in between the thumb and forefinger tip. It is achieved without the forearm stabilizing on the surface. At this time the fingers adjust to the size and weight of the object.

TRANSLATION

Translation is a linear movement of the object from the palm to the finger or finger to palm. The object stays in contact with the thumb and finger. The fingers move from more extended position to amore flexed position during the translation. Palm to finger translations requires isolated control of the thumb and use of patterns beginning with finger flexion and moving to the finger extension.

SHIFTING

Shift involves the finger to move just slightly at the MCP and IP joints and the thumb typically remain opposed or adducted with MCP and IP extension throughout the shift.

ROTATION

Two pattern of rotation have been identified as simple and complex. Simple rotation involves the turning and rolling of an object held at the finger pads approximately 90 degree or less. Complex rotation involves the rotation of the object 80-360 degree once or respectively.

NORMAL FINE MOTOR DEVELOPMENT

AGE

FINE MOTOR SKILLS

2 year

Grasp pencil in palm, grasp thick crayons with thumb and finger, plays with sand and water

2. 1 year

Unbuttons large, grasp small cup with one hand without spilling

2. 3 year

Grasp spoon with fingers and rotates wrist to bring spoon to mouth, washes hand by self, turns regular book pages at times,

2. 5 year

Grasping several ways depending on activity, turns rotating handles such as egg beaters, turns door knobs clockwise using forearm

2. 6 year

Grasp pencil with thumb and finger instead of fist, screws and unscrews jar lids, uses clay constructively

2. 9 year

Names simple objects in bag by filling inside, latches gate or other latches, uses small beads and pegs

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2. 11 year

Hold on object with hand while using the other such as when using paper and pencil, squeezes eye dropper

3. 0 year

Does finger play while singing little songs

3. 1 year

Uses simple art materials

3. 3 year

Uses tools and materials that strengthen arm, wrist, hand, and fingers , completes an easy puzzle

3. 4 year

Uses fingers to show age

3. 5 year

Consistently reaches for and grasps object with one hand, makes a fist and wiggles thumb, rolls clay or play dough on table to makes robes

3. 6 year

Feels object without looking and identifies hot and cold, wet and dry, grasp pencil with thumb , index and middle finger, grasp thick marker or large chalk with crude opposition of thumb and finger

3. 11 year

Buttons and unbuttons quarter-inch buttons, makes a flat, round cake by pressing and putting dough on table with fingers, buttons and unbuttons one medium-sized button

4. 2 year

Feels objects without looking and identifies hard and soft

4. 5 year

Touches tip of thumb to each finger , grasps thick marker or large chalk with thumb as pencil rests on third joint of middle finger, grasp thick marker or large chalk with thumb and pad of index finger marker rest on third joint of middle finger, screws or unscrews nut and bolts

4. 6 year

Feels objects without looking and identifies circle , squares and triangles, uses squeeze tool that strengthen arms, wrist hand and finger

4. 9 year

Feels object without looking and identifies circle, square and triangle, uses squeeze tools that strengthen arms, wrist, hand, fingers.

4. 11 year

Moves finger in fine, localized movement when writing with marker, squeeze bottle , places key in and open lock, place 1-1/4 paper clip on paper, hammers

5. 0 year

Laces shoe

5. 5 year

feels and identifies different textures, touches tip of thumb to each finger on same hand in under 8 seconds

5. 6 year

Prefers to use either right or left hand, uses class room tools appropriately, use squeezes and other tools that strengthen arm, wrist, hand and finger

5. 9 year

Cut well with scissors, uses materials and tools that increases finger dexterity

5. 11 year

Can use recipes that strengthen wrist, hand, finger