Criteria for Manipulation Patterns

1. **Pinch**: Object is held between two fingers. Both fingers are flexed simultaneously in order to translate the object along the ventro-dorsal axis, towards the palm. Fingers are then simultaneously extended to bring the object back to its starting position.
2. **Dynamic Tripod**: Object is held between three fingers. All three fingers are simultaneously flexed and extended, in repetitive motions, in order to translate the object along the ventro-dorsal axis. Application: writing.
3. **Squeeze**: Deformable object is held between three or more fingers. All fingers are simultaneously flexed towards the object's centroid in order to compress the object, e.g. when squeezing a rubber ball or compressing the plunger of a syringe.
4. **Twiddle**: Object is held between the distal phalanx of one finger (manipulating finger) and along the side of the proximal phalanx of another finger (stabilizing finger). The manipulating finger is flexed and extended in order to roll the object along the length of the stabilizing finger.
5. **Rock**: Round object is held between three or more fingers. Fingers are used to rotate the object about ventro-dorsal axis, e.g. when unscrewing the lid of a bottle.
6. **Rock II**: Elongated object is held in opposed grasp between three fingers. Two of the fingers are alternately flexed and extended in order to pivot the object about the third finger.
7. **Radial Roll**: Object is held between the distal phalanx of one finger (stabilizing finger) and along the side of the proximal phalanx of another finger (manipulating finger). The manipulating finger is flexed and extended in order to roll the object along the length of the stabilizing finger.
8. **Index Roll**: Object is held between the distal phalanxes of two fingers. One finger is then repetitively flexed and extended in order to roll the object along the length of the other finger.
9. **Full Roll**: Object is held between distal phalanxes of two fingers. One finger is then repetitively flexed and extended in order to pivot object about a stationary point on the other finger.
10. **Rotary Step**: Finger-gaiting sequence during which a round object is incrementally rotated about the ventro-dorsal axis by at least 360 degrees.
11. **Interdigital Step**: Finger-gaiting sequence during which an elongated object is incrementally rotated about a pivot point by at least 360 degrees. The rotation occurs about the ventro-dorsal axis.
12. **Linear Step**: Finger-gaiting sequence during which fingers are translated along the length of an elongated object. Sliding between fingers and object is generally required.
13. **Palmar Slide**: Elongated object is held in a palmar grasp. Two fingers, which are initially flexed with their distal phalanxes in contact with the object, are extended in order to translate object along the radio-ulnar axis. Application: removing cap from a pen.