ROLE OF CUTANEOUS AFFERENTS IN THE CONTROL OF FINE MOVEMENTS

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Abstract
An increase in the quantity of afferents has been observed to be less useful to normal individual, therefore to patients suffering from neurological problems. To determine the effect of reduction of cutaneous afferents in the control of fine movements. Sixty healthy individuals, age between 20 and 25 years, were randomized into 2 groups. Main outcome measures: The speed of movements was measured with a specific device constructed specially to this study, related to digital chronometer that detects 1/100 of the second. T-test was performed for outcome measure and to evaluate individual difference within groups in the presence of significance. The position at the edge of the support show an increase in the speed of the fine movement by 82% than the position completely on the support.

Keywords: Cutaneous Afferents, fine movements

Introduction
Concentration and mental focalization permit to filtrate the huge sensory activity and open widely the access to the mental field of one unique sensation. Many authors talked about the importance of cutaneous afferent in

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the control of fine movement. Recent experiment were done on healthy individual compare to pathologic cases, results show that somato-proprioception may have effect in the control of movement. Visual target remains the best choice to study the mechanism of coordination and guidance of movement. Time of reaction is an important measure for the speed of treatment of the information. The variations of the quantity of cutaneous afferents induce a variation in the control of finesse movement in two different positions.

**Material and methods**

Experiment was done on healthy individuals, which permit more to understand the organization of problems and the analysis of sensorial input in pathological cases. It is very difficult to find a homogenous group of individuals, especially in neurological cases.

60 males, age between 20 year and 25 year and of body mass index between 17 and 27 submit to this experiment at the same experimental conditions. They undergo the same movement in 2 different positions where the quantity of cutaneous afferent only changes but the positions of reference does not change. Conditions of the experiment: Positions of the subjects: Position 1: Sitting in a chair, thigh totally touched the surface of the chair, knee flexed 90 degree, trunk redressed, elbow flexed 90 degree, forearm reposed. Position 2: sitting in a chair, thigh partially touched the edge of the chair, knee flexed 90 degree, trunk redressed, elbow flexed 90 degree, forearm reposed.

![Position 1](image1.jpg) ![Position 2](image2.jpg)

**Tools:** Digital chronometer (Seiko) that measure a fraction of 1/100 of the second. Special devices produced to measure the speed of movement.
Application:

**Starting**

Speed of movement is calculated by the ratio of distance in cm over the time in seconds.

**Statistical results:** Repartition of subject according to body mass index (kg/m²)
• Variation of the means: speed of movement (cm/s).

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<th>T- test</th>
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<td>Between mean during sitting totally touched and sitting at the edge of the table.</td>
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**Discussion**

The results show that the speed of movement in 82 % of subject sited on the edge of the chair is better than sited in fully contact on chair. These results are not so far from those of Jacque Larue who totally deprives the subject from cutaneous afferents, while we reduce them.

**Conclusion**

The reduction of 80% of cutaneous afferents from posterior side of the thigh leads to better results in the control of finesse movement. Rehabilitation of neurological cases will get better results when we reduce the quantity of cutaneous afferents.

**References:**


Mesure S. les theories de l'apprentissage moteur.


