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MUSCULAR TONE AT REST: RELATIONSHIP WITH CUTANEOUS PLEASURABLE EXPERIENCE, AN INTERPRETATION ACCORDING TO THE DIMENSIONAL APPROACH TO CEREBRAL DOMINANCE[1]

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Summary.—This study examined some aspects of the relationship between muscular tone at rest and a particular kind of pleasurable tactile stimulation (tickle) in the light of the dimensional approach to cerebral dominance. Electromyographic scores, latencies, and tickle durations for six muscles and corresponding skin areas were taken both on the right and left sides of the body from 40 female students in psychology. There was an inverse relationship between muscular tone at rest and sensitivity to tickle stimulation, which is lower (long latency and brief duration of perception) when the levels of muscular tone increase. So we hypothesize that the muscular system (especially because the correlations of tone and latency are positive) plays a role through the afferents of inhibition of tactile pleasurable experience. This role is more evident for the left side of the body. The dimensional approach to cerebral dominance on the basis of myographic score identified three groups of subjects (right, left, and non-dominant). The subjects classified as right-dominant on the basis of myographic score show a longer duration of tickle on the right half of the body than on the left and longer latency on the left. The left-dominant subjects do not show any difference between the two halves of the body in duration of tickle but show longer latency on the left side. The non-dominant subjects show also no difference between the two sides of the body for both tickle duration and latency.

In the present research we examined whether the style of response to a particular tactile stimulation, positively connotated as tickle, is related to an organization of tonic muscular activity. At the physiological level, centers unify functionally tactile (exteroceptive) and muscular (proprioceptive) sensitivity in definite cortical areas, such as the post-central area of the brain. The relationship between tactile sensitivity and both static-tonic and dynamic activity of muscular system is very complex. Cutaneous stimuli can affect some spinal muscle-muscular reflexes. In fact afferent fibres from the skin stimulate the inhibitory interneuron of the reflex, so the motor response is blocked (Eccles, *et al.*, 1962; Jeneskog, 1979; Lundberg, 1979). However, research has not examined, at a strictly physiological level, the inverse relationship between muscular tension and tactile sensitivity. In this case afferent fibres from the muscle should affect cutaneous sensitivity. The expected relationship between skin and muscle has different integrative centers: spinal, supraspinal of brainstem, and cortical. For us, the integration refers to muscular tone, which, as Granit (1979) pointed out, was considered "as a reflex adjusting body to ground and part of the body to one-another, while today it is considered a

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kind of state of light excitation, the opposite to slackness. For instance, the transition from sleep to arousal is reflected on the motor-side by a mobilization of the gamma-spindle apparatus. This, in the cat, is another state, one of preparedness and proprioceptive awakening with subliminal or liminal activation of the motoneurons" (p. 18). So we consider tone as "a state, naturally also reflected in reflex excitability" (p. 19). We think that the response, at a given moment, to a tickle stimulus depends on the stimulus intensity and quality and on the pre-stimulus situation. The pre-stimulus situation can be characterized by different ratios and levels of excitation and inhibition present both on the input side as threshold levels of receptors and on the output side as threshold of effector activity, in the specific case of muscular activity. The traditional physiology clearly distinguished between muscular tensions at rest defined as "tone" and muscular activity associated with contractions producing motor activity. This contraction shows in two forms, isotonic with production of movement and isometric. But substantially the difference between tone and muscular contraction has been observed to be reflected only in the number of motor units involved. Between the two levels is almost a functional continuum, producing phenomenologically behaviors which are qualitatively different: from a hypothetical level of extreme hypotonicity (during sleep) to a level of tone representing the indispensable assumption of statics and equilibrium of the organism. The further raising of tone, with engagement of a greater number of motor units, indicates motor-preparedness for overt activity. Duffy (1972) identified this last level of muscular tension with concepts of activation and arousal. We, according to Pribram and McGuinness (1975), distinguish arousal from activation and define activation as "tonic physiological readiness to respond" (p. 116). Moreover, we think that muscular activation is tentatively aimed toward a directed behavioral response (attack-escape, approach, etc.). In this case activation would be a preparedness for an attack, escape, or approach. Always with reference to a continuum, if the number of stimulated motor units increases from a level indicating activation, muscular contraction is produced, which usually circumscribes the area of engaged muscles and polarizes them to the production of movement. The movement produced inhibits the centers of activation of the central nervous system by a feedback mechanism and muscular tone returns to levels of rest. If the preparatory activation is not followed by movement, a state of chronic activation persists. We think that this general chronic activation may be inhibited by a particularly high isometric contraction of only some muscles. The district of high contraction has the effect of reducing general activation by the same feedback mechanism. In this case, if the "contracture" becomes chronic, it can be expression of some so-called psychopathological conditions, as indicated by experimental and clinical writing (Goldstein, 1964, 1972; Sainsbury & Gibson, 1954; Reich, 1975). For some of these authors (Reich, 1975) a particularly high level of muscular tension (contracture) should produce an inhibition of the experience of free anxiety and pleasure. We think that also for normal subjects levels of muscular tension at rest may increase beyond the necessary levels for simple tonic/static functions, as if also normal subjects can be chronically hyperactivated without the subject knowing the aim or reason. It is understandable that the examination of muscular tension leads one to consider personality traits. In this sense we are interested in studying the style of organization of the muscular tension at rest for different body areas. But we believe that a complete study cannot examine output (motor) aspects without considering also the style of organization of input. In fact, even if we are far from a simple and elementary reflexlogical schema, we think the integration of sensorial cutaneous processes and muscular ones is constantly present. The psychophysiological concept of somato-muscular synthesis joins the anatomical datum of a somesthesic analyser in some cortical centre. A same system is responsible, in the relationship with the environment, for organizing input (from the skin) and output (by the muscles), and is characterized by some behavioral styles or pecularities. In fact, the interaction of the individual and environment requires continuous oscillations of sensorial levels and motor activity. It is easy to imagine that the two physiological variables are not always stimulated in the same direction.

We think there are subjects who are different at rest in terms of activation or arousal levels. We mean by arousal a "physiological phasic response to input" (Pribram & McGuinness, 1975, p. 116), if phasic and tonic arousal levels are possible. To study the relationship between cutaneous sensitivity and muscular tone means to clarify further the concepts of arousal (systems of input organization to which it is related) and of activation (system of response organization). It is important to study the sensitivity-muscular tone-relationship also considering the emotional components of sensory experience. To study a microexperience of pleasure related to some sensations we chose a particular behavior, tickle (Fisher, 1974), in which the skin is the seat of successive events: simple tactile sensation (latency), perception of specific sensation of tickle (duration of tickle), and inhibition of tickle with the only presence of a tactile sensation. By the term sensitvity to tickle we mean both aspects of tickle, that is, latency and duration of the perception of tickle. In studying response to tickle the level of muscular tone could inhibit the experience of pleasure. In this way we consider the model proposed on the basis of psychopathology to normal behavior. In previous research (Ruggieri & Milizia, 1983) we have singled out the style of control and inhibition of the experience of tickle. We think that the inhibition of sensitivity, associated with raising cutaneous thresholds, can, in its turn, depend reflexly on changes in muscular tone or rather that the subjects can raise thresholds of sensitivity utilizing reflexly the muscular system. This is our general hypothesis. But it is possible that the relationship of muscular tone and sensitivity in definite corresponding cutaneous and muscular areas is part of a response of preparedness to the environment (activation). Some interpretive categories of this hypothesis are those of cerebral dominance. Previous research (Ruggieri, *et al.*, 1982) suggests the right half of the body is active in interaction with the environment, while the left half is active when the subject pays attention to himself. The study of cerebral dominance has been carried out in according to the dimensional approach as proposed in our previous research (Ruggieri, *et al.*, 1980). This dimensional approach supposes that cerebral dominance is the result of a dynamic balance between the two hemispheres. We have suggested that there are different levels of cerebral dominance arranged along a continuum from a zero value to a maximum. This approach exceeds the categorial one which classifies subjects only as left or right dominant. We have found left, right, and non-dominant subjects in different fields of dominance: sighting dominance (Ruggieri, *et al.*, 1980), perception of the right and left halves of the body (Ruggieri & Valeri, 1981), muscular tone at rest (Ruggieri & Sabatini, 1982), sensitivity to tickle (Ruggieri & Milizia, 1983).

METHOD

Subjects

There were 40 female undergraduates in psychology in the experimental group. They were aged 20 to 34 yr., with a mean of 27 yr. All subjects declared themselves righthanded.

Procedure

Two different measures were made, muscular tone at rest and tickle sensitivtiy. The muscular tone at rest was measured by electromyographic equipment with surface electrode couples. The electrodes were tin cups 8.5 mm in diameter and spaced one every 7 mm. They were filled with electrode jelly and strapped on with adhesive plaster. The changes in frequency of EMG potential, amplified by an amplifier with the band pass between 60 and 1200 Hz, were transferred into a digitalized signal by means of zero-crossing apparatus. In turn the digitalized signal was converted into a tension-signal by an integrator, expressing a difference in potential as proportional to the frequency of EMG potential. The tension-signal was sent to a tension-frequency converter and then to a decoding counter. The decoding counter showed the mean integrated frequencies appearing in 1 sec. The frequency of electric activity of muscle at rest was examined by the method of zero-crossing suggested by literature (Budzynski & Stoyva, 1973). The integration of amplitude which has a role in the activity of muscle at rest is not considered by the method of zero-crossing.

For each subject we have placed the electrodes on the following sites: left and right zygomatic, sternocleidomastoid, pectoral, abdomen rectum, adductor, and brachio-radialis muscles. The measures were taken in random order by a preprogramed criterion. For the zygomatic the electrodes were placed both on the right and left cheeks immediately under the zygomatic bone; for the sternocleidomastoid placement was on both right and left midway between the mastoid apophysis and the sternum. For the pectoral electrodes were placed on both right and left hemiclavear linea about 10 cm from the clavicle bone; for the abdomen rectum placement was on the right and left planes passing through the umbilicus about 3 cm from the umbilicus itself. For the adductor placement was on both right and left medial faces of the thigh about 5 cm from the pubic synphysis; and for the brachio-radialis on both right and left two-thirds of the superior of the forearm. The earth electrode was placed on the right wrist. For each muscle a mean score of five measures was obtained, each measure lasted 1 sec. spaced by 1-sec. intervals from others.

The tickle sensitivity was measured stimulating vertically the body parts corresponding to the examined muscular areas along an area of about 5 cm, with a wad of cotton weighing 3 mg. The frequency of stimulation was of 1 skim a second for a maximum of 120 sec. Each subject was instructed to signal by the word "yes" the appearance of the tickle sensation as pleasurable, different from simple touch, causing "goose pimple" and slight disquiet; by the word "no" the disappearance of the tickle sensation replaced by a simple tactile sensation. Two scores were obtained: latency from the beginning of the stimulation to the beginning of the tickle perception, and duration of tickle from the beginning of tickle until its modificaton. When the perception of tickle did not occur, we assigned a time of 130 sec. as the maximum latency. If the perception of tickle was not replaced by other sensations, either negative or neutral, we assigned a maximum duration of tickle as 130 sec.

Myographic and tickle sensitivity measures were carried out in the morning and randomly on different days by two female experimenters. The subjects, individually tested, lay on a medical-type cot in a laboratory-room whose temperature was always 26° C.

RESULTS

In addition to scores for right and left single muscles, for each subject we have calculated the total mean right myographic score (mean value of the six examined muscles on the right half of the body), the total mean left myographic score, that total mean right latency and duration of tickle, the total mean left latency and duration of tickle. Moreover, the difference scores between left and right sides for all the three variables were also calculated. The mean scores and standard deviations of muscular tone both on right and left sides, latency and duration of tickle and Student's t for dependent means between the two halves of the body are indicated in Table 1. Within the total group the difference between the two halves of the body is statistically significant only for latency, higher on the left ($p < 0.05$). The mean latency duration of tickle, and muscular tone for the six examined areas plus the total mean

TABLE 1

MEANS AND STANDARD DEVIATIONS OF BOTH RIGHT AND LEFT MUSCULAR TONE, LATENCY AND DURATION OF TICKLE FOR ALL SIX BODY AREAS AND STUDENT'S *t* FOR DEPENDENT MEANS BETWEEN RIGHT AND LEFT SCORES PER MEASURE

Measure		Right Half	Left Half	*t*
Total myographic score	*M*	88.69	88.76	−0.03
	SD	16.76	17.85	
Total latency	*M*	6.25	15.64	−4.39*
	SD	8.79	16.26	
Total duration	*M*	49.94	47.41	0.91
	SD	39.91	40.58	

*$p < 0.05$, df 39.

value for the two halves of the body are indicated in Table 2. The areas with higher levels of muscular tension show, on the average in the group of examined subjects, longer latencies and lower durations of tickle. The opposite occurs for the areas with lower myographic scores. Pearson's correlations of the right and left mean myographic scores for the six areas plus the total mean value with the corresponding mean latencies and mean durations of tickle have shown: (1) a negative correlation between muscular tension and duration of tickle which on the right is only a tendency ($r = -0.63$, $df = 5$, $p < 0.1$) and on the left is statistically significant ($r = -0.71$, $df = 5$, $p < 0.05$), (2) a positive statistically significant correlation only on the left between muscular tension and latency ($r = 0.90$, $df = 5$, $p < 0.05$).

Pearson's correlations among muscular tension, latency, and duration of tickle for the whole group of subjects indicate that on the left side of the body the total mean myographic score is not correlated with the total mean duration of tickle, while there is a strong tendency toward positive correlation between the total mean myographic score and the total mean latency ($r = 0.25$, $df = 38$, $p < 0.1$). On the right side of the body the total mean myographic score is not correlated with either the total mean duration of tickle or total mean latency. Moreover, we can identify several important facts and relations indicated in Table 3.

In Table 3 are indicated the significant Pearson's correlations of myographic scores with latencies and durations of tickle for the areas of the body. Not all the areas of the body show significant correlations between muscular tension and sensitivity to tickle. Most of the significant correlations show the inverse relationship between muscular tension and sensitivity to tickle for both right and left sides of the body, that is, a positive correlation between myographic scores and latencies and a negative correlation between myographic scores and durations of tickle. The data of Table 3 indicate that, when muscular tension increases, both readiness to perceive tickle (increase in latency) and duration of tickle decrease.

However, we think that our results must be verified further utilizing a larger number of subjects because the standard deviations of some scores of latency are very large.

Cerebral Dominance

According to the dimensional approach to cerebral dominance (*Ruggieri, et al.*, 1980; Ruggieri & Sabatini, 1982; Ruggieri & Milizia, 1983), we have calculated for each subject the difference between the right and left myographic scores, the right and left latencies, and the right and left durations of tickle. So we have found three groups of subjects, right, left, and non-dominant (when the difference between the scores of the right and left sides of the body is near to zero) as to myographic score, as to latency, and as to duration of tickle. The three groups classified as to dominance on the basis of duration of tickle and three groups classified on the basis of latency do not show statistically significant differences in muscular tension between the two halves of the body within each group or among the groups.

On the contrary, interesting results appear when the subjects are classified

TABLE 2

MEANS, STANDARD DEVIATIONS OF MYOGRAPHIC SCORE, LATENCY, AND DURATION OF TICKLE IN DIFFERENT AREAS OF THE BODY

Measure	Right Half		Left Half	
	M	*SD*	*M*	*SD*
Total mean value				
Myographic score	88.69	16.76	88.76	17.85
Latency	6.25	8.79	15.64	16.26
Duration	49.94	39.91	47.41	40.58
Cheek				
Myographic score	125.74	32.55	118.21	30.92
Latency	8.61	28.26	37.71	57.59
Duration	34.59	40.87	25.65	40.99
Neck				
Myographic score	99.40	24.25	102.79	25.77
Latency	5.50	20.30	21.31	46.26
Duration	59.60	48.82	49.94	52.57
Thorax				
Myographic score	79.03	33.71	85.06	36.27
Latency	3.22	4.76	5.55	20.33
Duration	48.75	46.21	52.00	47.03
Abdomen				
Myographic score	82.93	39.69	77.43	33.32
Latency	9.84	28.50	12.46	34.04
Duration	46.46	47.92	54.94	49.22
Forearm				
Myographic score	68.70	24.51	65.23	34.30
Latency	4.72	5.46	6.60	20.83
Duration	53.48	44.70	47.70	44.53
Thigh				
Myographic score	75.70	30.32	84.15	32.02
Latency	5.66	20.33	10.24	28.70
Duration	56.80	52.53	54.28	48.77

TABLE 3

SIGNIFICANT PEARSON'S CORRELATIONS OF MYOGRAPHIC SCORES WITH LATENCIES AND DURATIONS AMONG EXAMINED AREAS OF THE BODY ON BOTH LEFT AND RIGHT SIDES

	Left Latency				Left Duration			
	M	Thorax	Cheek	Neck	*M*	Abdomen	Neck	Forearm
Left myographic score								
M	0.25		0.29					
Rectum			0.32		−0.27	−0.35	−0.26	
Sterno			0.35					−0.28
Brachio	0.30	0.38						
Pectoral				0.27				

	Right Latency		Right Duration		
	Thorax	Forearm	Thorax	Forearm	Thigh
Right myographic score					
M			−0.26		
Adductor		0.27			
Rectum	0.31	0.36			
Sterno				−0.31	−0.26
Brachio			−0.32		

$p < 0.05$.

as to dominance on the basis of myographic score (Table 4). Right-dominant subjects show a statistically significantly longer durations of tickle on the right than on the left side of the body ($p < 0.05$) and a latency which is longer for the left than the right side ($p < 0.05$). Left-dominant subjects show no difference between durations of right and left tickle, but statistically significantly longer latency on the left side of the body ($p < 0.05$). Non-dominant subjects show no statistically significant differences between durations of right and left tickle and between right and left latencies. Moreover, right-dominant subjects have a mean right latency much shorter than the other subjects and statistically significantly so from the non-dominant subjects ($p < 0.05$).

Pearson's correlations among latency, duration of tickle, and muscular tension within each group of dominance have shown for right-dominant subjects: (1) no correlation among muscular tension, latency, and duration of tickle for the right half of the body, (2) a positive correlation between muscular tension and latency for the left side of the body ($r = 0.64$, $df = 12$, $p < 0.05$), (3) a positive correlation between right muscular tension and latency of the contralateral half of the body (left) ($r = 0.61$, $df = 12$, $p < 0.05$). In these subjects, except for the dominant side of the body, the hypothesized direct relationship between muscular tension and resistance to tackle (latency) is preserved. This relationship is not present either in left-dominant subjects or non-dominant subjects.

In conclusion, the right-dominant subjects show a higher level of muscular tension and a longer duration of sensorial excitation (duration of tickle) on the right than on the left side of the body. But the right muscular tension

TABLE 4

MEAN SCORES AND STANDARD DEVIATIONS FOR RIGHT AND LEFT HALVES OF THE BODY OF LATENCY, DURATION, AND MYOGRAPHIC SCORES OF RIGHT, LEFT, AND NO DOMINANT SUBJECTS CLASSIFIED ON THE BASIS OF MYOGRAPHIC SCORE

	Latency			Duration			Myographic Score		
	Right	Left	*t**	Right	Left	*t*	Right	Left	*t**
I Right dominant (*n*, 14)									
M	2.33	11.25	−3.11†	53.08	46.85	2.24†	92.98	78.27	8.21†
SD	1.69	11.17		45.47	45.61		16.70	15.13	
II Left dominant (*n*, 15)									
M	6.49	21.78	−5.89†	43.26	37.77	1.04	85.58	99.25	−6.23†
SD	9.53	15.93		36.62	36.99		18.83	17.59	
III No dominant (*n*, 11)									
M	10.92	12.86	−0.36	55.03	61.28	−1.12	87.46	87.81	−0.46
SD	11.18	20.53		38.75	38.07		13.81	13.84	
Student's *t* for independent means									
I, II	−1.61	−2.04		0.64	0.59		1.11	−3.43†	
I, III	−2.85†	−0.25		−0.11	−0.84		0.88	−1.62	
II, III	−1.08	1.24		−0.79	−1.58		−0.28	1.78	

*Student's *t* for dependent means between right and left latency, duration, and myographic scores of each dominance group and Student's *t* for independent means between latency, duration, and myographic scores of the three dominance groups on each half of the body. †$p < 0.05$.

and the duration of right tickle are not correlated. Moreover, the left latency is longer than the right latency both for right-dominant and left-dominant subjects.

DISCUSSION

The data tend to confirm our hypothesis about the inhibitory role of specific levels of muscular tension on sensitivity to tickle. In fact, a general tendency toward an inverse relationship between muscular tension and sensitivity to tickle appears (positive correlation of muscular tension with latency and negative correlation of muscular tension with duration of tickle. We interpret this datum on the light of psychophysiological research (Eccles, *et al.*, 1962; Lundberg, 1979; Jeneskog, 1979) which has pointed out the inhibitory role of cutaneous afferences on muscle-muscular reflexes. In our case we hypothesize a siutation reciprocal to that described by these authors, that is, the inhibitory role of muscular afferences on cutaneous sensitivity. Moreover, we hypothesize that the inhibitory effect of muscular tension on sensitivity is of tonic type, that is to say, that it constitues a basic condition of subjects' regulating the threshold of sensitivity to the pleasurable stimulus of tickle. In fact our data indicate that there is a direct relationship between muscular tension and latency. Also to explain the inverse relationship between muscular tension and duration of tickle we hypothesize that inhibitory afferences from muscle block the response to cutaneous stimulation and interrupt the sensation of tickle.

Our hypothesis agrees with the physiological research of Emonet-Dénant, *et al.* (1977) that has demonstrated the presence of different anatomic functional categories (six) of gamma system fibres, which, as it is known, have the function of modulating tonic and phasic muscular activity. Some of them are involved only in the dynamic response, others in static activity. It is understandable that the muscular tone is the result of a complex system of regulation and that there are different systems of control in inhibitory processes. If we accept that the muscular system, and particularly the gamma system, can modulate sensitivity to tickle, we can deduce the existence of different, independent subsystems of inhibition from the muscle, one related to latency and indicating the basic inhibitory attitude of resistance to change and another, not so evident, related to the duration of tickle.

Our data also agree with the clinical hypothesis (Reich, 1975) that attributes to the hypercontracted muscular system the function of inhibiting emotional experience (anxiety, pleasure, etc.), because we consider tickle to be a microexperience of pleasure. But between the clinical hypothesis referring to particular neurotic situations and ours there are important differences. In contrast to the clinical hypothesis where the inhbition is linked to particularly high levels of muscular tension (contracture), here we can find an inhibitory effect of muscular tension on sensitivity also with relatively low myographic levels. It is important that, when muscular tension increases (in a normality range), in parallel also latency increases. It is interesting that the inhibition hypothesized by us refers to a particular sensory modality, that is, the "pleasurable" experience of tickle. The role of muscular system in modulating emotionally connotated experiences can be foreseen.

Examining our results analytically we point out that the total mean scores on all three variables (myographic score, latency, and duration of tickle) are not correlated (except for the tendency to the positive correlation between muscular tension and latency on the left side of the body). Correlations appear between myographic score of some specific muscles on one side and total mean latency and duration of tickle on the other, and vice versa between total mean myographic score and latency and/or duration of tickle of some specific areas of the body. It is easy to hypothesize that the inhibitory role of muscular system on sensitivity to tickle depends upon some specific muscles which we call modulator-muscles. This is very clear for the left side of the body where there is a direct relationship between the muscular tone of brachio-radialis and the total mean latency and the inverse relationship between the muscular tone of abdomen rectum and the total mean duration of tickle. It is also interesting that the cheek of the left side of the body represents the target-area to which the inhibitory regulation from muscles converges. In fact the total mean left myographic score, the left myographic scores of abdomen rectum and sternocleidomastoid are directly correlated with the latency of the left cheek (Table 3). Such relationships are not so clear for the right side of the body.

Cerebral Dominance

The dimensional approach to cerebral dominance (Ruggieri, *et al.*, 1980; Ruggieri & Sabatini, 1982; Ruggieri & Milizia, 1983) has pointed out interesting relationships between muscular tension and sensitivity to tickle. In our results we have indicated that there are three groups of dominance, right, left, and non-dominant subjects, classified both by the differences in muscular tension between the two halves of the body and the differences in latency and duration of tickle. It is interesting that, while subjects classified as to dominance on the basis of latency and duration of tickle show no differences in the level of myographic score, subjects classified by muscular tension show statistically significant differences in latencies and durations of tickle. Particularly, right-dominant subjects, that is, those with a higher myographic score on the right than on the left side of the body, have also a longer duration of tickle on the right than on the left side. In addition, these subjects have also a longer mean latency on the left half of the body. It is also interesting that the non-dominant subjects in myographic score show no differences in sensitivity to tickle for the two halves of the body, while the left-dominant subjects have only a longer latency on the left half.

The analysis of muscular dominance singles out a group of subjects, right-dominant ones, who show a marked differentiation between the two halves of the body, both on motor and sensory sides. In other research (Ruggieri, *et al.*, 1982) we have pointed out that the right half of the body is more active in the interaction with the environment, while the left half is involved when the subject pays attention to internal emotional contents. We hypothesize that the right-myographic-dominant subjects have a greater tendency to interact with the environment both on motor-manipulative (higher myographic score) and sensory sides (longer duration of tickel and lower latency). The right latency of this group is lower than those of left-dominant and non-dominant subjects, indicating a greater readiness to respond to the tickle stimulus. In the case of right-dominant subjects the particularly high, right myographic score, higher not only than the contralateral one but also than the scores of left-dominant and non-dominant subjects, would not indicate so much a system of inhibitory regulation as a system of activation defined as tonic preparedness to action (Pribram & McGuinness, 1975).

The functional typology of these subjects is complete recall that not only is present in long latency on the left half of the body but is statistically significantly correlated with both left and right myographic scores, differently from the other two groups of dominance. We think these subjects show at the same time an efficient system of interaction with the environment on the right side of the body and an efficient system of inhibition on the left side of the body. It is the interaction of these two systems which defines, for us, the more differentiated personality of the right-dominant subjects. The non-dominant subjects appear as least differentiated and show a substantial equivalence between the two halves of the body both for muscular tension and sensitivity to tickle. Finally, the last group constituted by myographic left-dominant subjects show a high left-myographic score (higher than the homolateral ones of the other two groups) which is coupled with a long left latency. It remains to be explained why there is no statistically significant correlation between these two variables for this group. We hypothesize that it may depend on the level of muscular tension which exceeds a certain critical level.

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