

Place and Position

A fundamental aspect of all living things is that at every given moment they occupy a **'place'** and at the same time they assume a **'position'** in that **'place'**. In the case of human beings, these two conditions of **'place'** and **'position'** play the most crucial role in the performance of all the activities of daily living... be they cognitive or vital functions, expressive functions, manipulative or locomotive acts. Everything we do is made up of the positioning of our parts in a venue. These both serve as background for the rest of the movement that comprises the activities of our lives. This additional movement is that of locomotion, hygiene, surviving, communicating, helping others, making things and myriad other life activities that are accomplished with our physical movement

'Place' is the external element where our life activities are located, while **'position'** is an internal aspect of human activity. It is what we do with our parts (masses) while occupying the **'place'** we find ourselves in. The two, **'place'** and **'position'** are a unity. Relative to the activities of life, one without the other is unthinkable. In the course of living we continually alter the space (**'place'**) we occupy. We make chairs, tables, steps and all manner of altered surfaces. At the same time gravity is a constant factor on the motion of our parts. It is also a critical aspect of **'place'**.

Human Factors Science (ergonomics) studies how the characteristics of **'place'** influence human performance. It is a well founded science. But, what is less well studied is how the **'position'** of our body parts, (what we refer to as "masses") affect all aspects of the movement that comprises the performance of all the activities of daily life. You can experience that this is so by simply holding one leg in the air while sitting in a chair and notice how it affects your breathing, heart rate and even your attention. The reason is that positioning your body parts in the gravity field in such a way that their weight does not flow easily to stable support requires that extra muscles are called on to compensate.

The point is one that Moshe often made, that you cannot use the same muscles to perform opposing actions at the same time. This observation is part of his theory of learning which asserted that the principle effect of learning is neural pattern differentiation for each action of our muscle/skeletal system. If muscles are used to support masses in the gravity field that would otherwise be used to perform breathing motion or some other action, then there is a conflict of movement resources. The study of the role of **'position'** in the performance of human functions was a primary subject of investigation at the Behavioral Cybernetics Lab at the University of Wisconsin, Madison during the early 1970's¹. We, the authors continued working on understanding the role of **'position'** and applying it to human functions in the Kinaesthetics programs that we developed in Europe over the last 40 years.²

¹ An internet site with the archives of the UW Madison Behavioral Cybernetic Studies led by Karl U Smith may be accessed at Cybernetics.cc

² Kinaesthetics.com

Masses and Spaces

“Masses” are the primary weights of our bodies. We have seven masses--head, chest and pelvis, and four appendices- two arms and two legs. Surrounding each mass is free space that allows for movement in all directions that are not blocked by external solid objects. And, between each mass are comparatively free “spaces” that, by means of contractile soft tissue, control and allow movement of the masses in almost unlimited directions. This control is accomplished by the motor-sensory nervous system through muscles. Large numbers of our muscles are arranged in tandem and complimentary pairs that cross between masses connecting them to each other. These muscles control the time/force and direction of each mass in the gravity field. Each mass is individually subject to gravity forces as well as to any other physical conditions, man-made or otherwise. In the terms of this paper, our masses are subject to the nature of the “**place**” we act in.

The masses themselves are formed by the bony skeletal structure into obvious coherent groups. If you move one of your masses like your head or chest, all of its parts come along, including the soft tissue attached to the bones in each mass. It is the bony masses that deliver their individual weight to other masses and on to supporting surfaces. The muscles have the function to move our bony masses relative to each other, under the effect of gravity and then on toward stable support. We point again to the ghost of Moshe Feldenkrais who on a number of occasions referred to bones as being an anti-gravity system. Go think!

“Basic Positions”

Positions’ are determined by how we arrange our masses. It turns out that in human beings there are seven basic positions in which the seven masses can be effectively arranged to best counter-act the effects of gravity. They are supine, prone, sitting, hands and knees, one knee stand, one leg stand and finally two leg stand.

What makes these seven positions basic is that while in them the weights of our masses are balanced with each other. That means that their weights are transferred from one to another and on to external stable surfaces with a minimum of muscle engagement. This is in contrast to all other positions we can assume in between those basic positions. You can explore the truth of this assertion by comparing the difference in the effort you need to hold any position you may take that is between each of the basic positions. Do this test by trying to hold a position that is half way between supine and prone and then between prone and sitting, then between sitting and hands and knees. Continue this experiment with each of the rest of the basic positions. Holding at any point in between the basic positions will result in shortness of breath, greater exertion and muscular fatigue.

Moving between the seven “Basic Positions”

Supine to Prone

There are other more technical ways to determine the seven basic positions. One way is to sequentially extend and rotate each mass till it draws the next mass into rotation and extension. Begin in supine position with the head mass first, followed by the chest and the arms. Then

finally roll and extend the pelvis and the leg on the side in the direction of turning. This sequence of combined extension and rotation of each mass results in turning over from the supine position to a prone position that is supported by extended arms with flexed elbows. Slightly more of your weight will remain on the side of the direction you are turning. You will come to the end of this motion because the opposite side of your body will tend to slightly flex stopping further rotation.

Because extension of each mass moves its weight downward in the body the combined extension of each mass elevates the upper torso to the height of the upper arm away from the supporting surface. The dominant weight on the arm and leg will be on the side of the direction of turning. To return to the supine position flex and rotate each mass in sequence in the other direction beginning with your head followed by your chest, arms, pelvis and pivoting leg.

Prone to Sitting

However, to go from the basic prone position to sitting you begin by flexing and rotating your pelvis in the reverse direction. This is followed by your chest mass and then your head mass. Your extremities aid by flexing and rotating in the same direction as the central masses. At the end of this sequence of motion your legs will be folded and each of the other masses will be stacked in a tailor's sitting position with hands resting lightly on the floor at your side. Return to the prone position by reversed rotation and flexion of each mass beginning with your head.

Sitting to Hands and Knees

To go from sitting to hands and knees, begin with head extension and reversed rotation followed with chest extension and rotation then extension and rotation of your pelvis. Your extremities will follow as in the last position change resulting in a hands and knees crawling position. Reverse the sequence to return to sitting. You will notice that there is only one direction to turn from sitting and that is away from the leg that is folded in front.

Hands and Knees to One Knee Stand

Continue to the next higher position from hands and knees to a one knee stand. Reverse the sequential rotation and flexion of your pelvis, chest and then your head while allowing one leg to stand. Your weight bears on the pivoting knee. Reverse rotation and extend each mass to return to hand and knee position.

One Knee to One Leg Stand

Moving in this way to standing from one knee position is somewhat tricky. It requires that the weight bearing leg with bent knee must be strong enough to move most of the weight from the knee in a spiral motion to the foot on the same side. The standing foot can help the standing motion a little, but it requires strong core strength. This movement, beginning, with reversed turning and head extension then with the chest followed by the pelvis and leg, results in a one leg stand on the side in the direction of turning. Bring the masses back to a neutral position one after the other and your weight will even out into a two leg stance. Each position change requires a reverse in direction.

More Evidence

Notice that in every sequence from one basic position to the next there is an alternating spiral pattern that sequentially uses all the rotation and extension of each mass. This pattern of spiral movement between each basic position constitutes another evidence of the existence of basic positions. They are the result of using all the available freedom of motion between each mass. Because our body masses are symmetrical from side to side, but not from top to bottom, nor from front to back, the movement between positions leaves the dominant weight on one side depending on the direction of rotation of the masses. This is not so of supine or the two leg positions which are symmetrical.

Weight Bearing

A simple description of weight bearing of each mass in each **'basic position'** is as follows; In supine position each mass is supported equally on a supporting surface, in prone position the masses of the head and chest deliver their weight to the floor over the flexed arms. The pelvis touches the floor but mostly passes its weight to the extended pivotal leg on the floor. The radius leg on the other side is lightly flexed with less weight bearing to the floor. The sitting position is one in which most of the weight of the central masses passes to the supporting surface over the pelvis. The legs which hang from the pelvis pass their weight mostly to the floor. While the arms which hang from the chest give their weight only slightly to the supporting surface. Otherwise the extremities pass some portion of their weight to their respective central masses. Both, upper and lower extremities are well positioned to correct the balance of the central masses by means of their out-laying relationship. In hands and knees the central masses bear their weight to the ground over both legs and arms-slightly more so over the legs. Prove this to yourself by comparing clapping your hands while in this position with clapping your legs. One knee stand bears almost all of the body weight over the standing knee. This is obvious if you compare lifting your standing leg to lifting your weight bearing knee. One leg stand bears all of the weight of the other masses. While a two leg stand mutually shares all of the body weights onto the floor. It is a symmetrical position as is supine.

Hinge Joints and Rotation Joints

There are additional anatomical characteristics that are responsible for **'basic positions'**. Among them are the pattern in our bodies of alternating levels of hinge joints and rotation joints. This pattern results in the characteristic spiral motion that comes from combining their movement at each level. An example of this spiral is to reach and grasp something with your hand and arm. If you reflect on the experience of moving between basic positions earlier in this paper you will realize that the extension or flexion and rotation of each mass is an example of combining the movement of hinge joints and rotational joints. This is the combining of levels of motion that leads to basic positions. It accounts for the spiral motion from sitting to standing by pushing on the floor at your side with one hand that Moshe often taught in his workshops. In this case you jump over every other basic position in order to stand without the zing sag that a formal sequence of position changes would cause.

Human Functions

What is the role of '**basic positions**' for human functions? They are stable platforms on which all the things that we do take place. These "things" we call "**human functions**". These functions include literally every possible thing we can do... all visceral, communities, locomotive, manipulative or reproductive act we are capable of. Clarifying the '**basic position**' in which any critical human function is being performed is a way to enhance performance. As we have argued, trying to perform any activity in positions that place one mass or another in inappropriate configurations will degrade performance. The choices to correct that would be to adjust the position or to learn new motor skills to compensate. It is far easier to change positions that make the effort easier than it is to learn and train new motor skills. At least position adjustment should be the simple first step.

Sitting

Sitting in the course of performing the activities of office work is currently the object of much criticism. Some have called sitting the primary health hazard of modern times. And, well it might be. But, it could be that a better understanding of the '**basic position**' of sitting would help to improve its reputation in the work place.

Putting yourself in a chair is not necessarily sitting from the perspective of '**basic positions**'. First it must be recognized that the chair is an example of a modified '**place**'. Endless chair designs are available. They run from one or three leg stools without arm support to stable benches and to luxurious lounges that support the head, arms and legs. Some can recline, move about and even perform complex massage treatments. Large balls and gyrating stools are also available. The selection is endless. And, the human function of "sitting" is also endless in variations. Keep in mind that formal "sitting" has the weight of the three central masses bearing to support over the pelvis, while the weights of the extremities are parceled out to different degrees by hanging or bracing from their central masses. They also usually go on to hang or brace from external structures. This means that "sitting" can be varied without end by continually shifting weight around to different masses.

The idea is to continually explore the possible variations while being in the position of "sitting". Shift your weight from on sitting bone (Ischia) to the other. Push or pull with one extremity or another on the floor or the table or arm rest. And, move the central masses about so that they exert their weights differently on each other. Simply said, move about all the time on the chair. You may perform counter point movements of the central masses. For example, by rolling or rotating your pelvis in one direction and your chest mass in another and so on and on. You can engage in all these possible movements of your masses and still be within the nominal position of "sitting".

You can go even further by going beyond "sitting" and shifting to other basic positions. In reality most people spend more time in a partial supine position in the comfortable chairs that are usually found in most offices. If you lean back with your head and chest resting on the back of the chair and your arms are supported by the arm rest this is no longer "sitting" as we have described it. Rather, this is the formal "basic position" we call "supine". No matter, it works in

most chairs with back and arm rests. And, let's be honest, this is how most of us occupy chairs most of the time. Not only is shifting to variations of sitting useful for wellbeing, so is moving between basic positions in and around the office environment. Changing from supine position in a chair back to sitting means jumping over the prone position. Of course you can strain against the force of gravity to sit forward. But, much better is to make a spiral by extending and rotating one mass after the other beginning with your head mass just as you would do if you were going from supine on the floor to moving towards a prone position. The form of the chair will stop you from turning over, but then you go as far as the chair allows then, reverse with flexion and rotation in the other direction to come to sitting without fighting against gravity.

Another move from sitting in a chair to coming to a one knee position in front of the chair is to sit on the front edge of the chair. Sequentially turn and extend each mass until the knee away from the direction of turning reaches the floor in front of the chair. You la! One knee stand. Try it. You can work at a desk in this position as well.

Our point is that it may be liberating for you not to be too bound to looking for the one and only correct way to sit. Rather, be willing to look for many possible ways to arrange your seven masses relative to whatever **"Place"** you may find yourself in. Keep moving even in **"place"**.