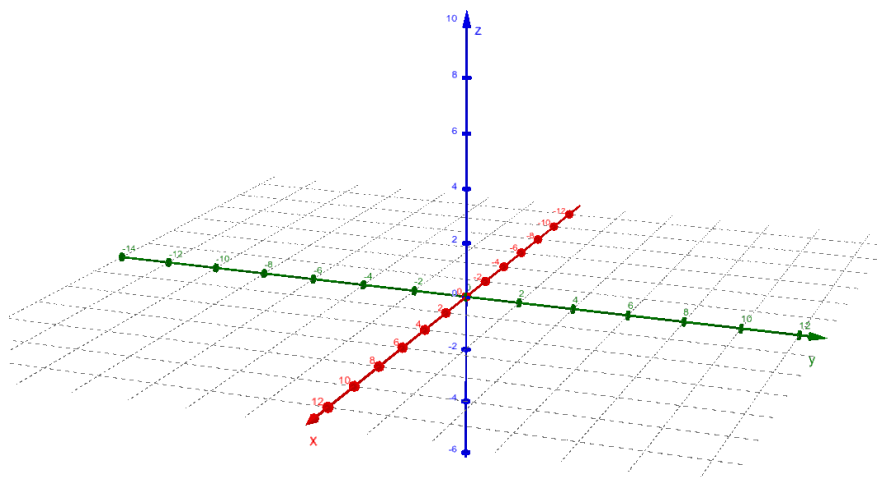


Perceiving, The Fourth Dimension

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The fourth spatial dimension lurks in the mysterious blindspot of our perception. Three dimensions are familiar to us: width, height and depth; or, x, y, z axes respectively [1].



Each dimension sits at right angles to the previous dimension: Y is at a right angle to X, and Z is at a right angle to both X and Y. Therefore, to add a fourth dimension Q, it must be at right angles to X, Y and Z. Hold this in mind.

Let's take a quick detour to look at two dimensions for a moment - we can pick any two, so let's simply take x and y. If you physically perceive only these two dimensions, you cannot point into the third (z) dimension. Your physical experience simply does not include that 'direction.' You couldn't point 'up' because 'up' is not a perceived or physical reality for you. So, physically, you are limited to two dimensions.

However, there would be a place you would be looking *from*, that turns what you are looking *at* into the objective reality you perceive before you. Your two dimensional reality is, in effect, known from a third dimensional stand-point *in which* two dimensions of physicality appear. You perceive two dimensions because you are looking from (and as) the third dimension. Yet, you remain

incapable of looking directly at the place you are looking from... which seems obvious when you say it.

So, in a gentle philosophical pondering, I find myself wondering if *the position of observation* is the dimension sitting at a perfect right angle to whatever physical world we perceive.

The position of observation cannot be pointed at, because it is where any pointing comes from - similar to how fire does not burn itself and light does not illumine itself. Agreed, pointing at our own physical system looks like it points to where the pointing is coming from, but we can recognise here that this remains a physical loop, and never touches the dimension from which it is perceived. You cannot penetrate into and touch the ethereal realm of perception with your physical finger.

When looking at the simple 2D world of X and Y, we can talk of adding another dimension at a right angle to it because we can already perceive the physicality of that third dimension, Z. For example, a circle is a two dimensional idea, created and perceived from the third dimension of physicality. We add a third dimension to the circle and it becomes a sphere. When it comes to adding another dimension at a right angle to X, Y *and* Z however, we reach the end of the road... physically.

The right angle to the three dimensional world is the "fourth dimension" and given that it cannot be pointed at from the third dimension, this may well be found as the point of observation from which the three dimensions are perceived. Therefore - if we are to insist upon dividing space into dimensions - we may already be living from the fourth dimension.

So the perfect right angle to any dimension n is, theoretically, the perfect point from which that dimension n can be perceived. Think again about two dimensions, the best possible vantage point from which to perceive it is the third dimension. From this point of view nothing is hidden, everything is perfectly clear, you can see inside two-dimensional objects, you can travel across the second dimension quicker by not having to manoeuvre around every object in the way. You can simply float up and over, landing exactly where you want to be. You'd

appear to teleport for a two-dimensional being. Consider mazes drawn on paper where the goal is to draw a line with a pen or pencil to reach the end. You have to navigate the two dimensional world, and it can take a few minutes to finish. However, knowing the third dimension of the physical world, you don't have to do that at all. You can pick the pencil up and drop it at the end, all in the space of a second.

From the perfect right angle to the third dimension - the fourth-dimensional point of observation - the entire three-dimensional physical world is the object before us. We divide the 3D world into three, two-dimensional planes and navigate those planes like gods. We can move through X, Y or Z with ease. However, just as lines on a page hindered the movement of the 2D pencil line, other 3D objects like walls, organisms and rocks hinder movement of the 3D object we call 'my body'.

If we were to hypothesise a right-angle from our *fourth*-dimensional perspective, we arrive at the fifth dimensional point of observation, aware of four dimensions of physicality. This perspective would be able to traverse the 2D and 3D world in a way we would certainly call god-like. My mind staggers to comprehend just how big of an impact this would be for us to witness. Recall the maze and the pencil, and let's turn that into a three-dimensional example.

When we move the pencil in the third dimension, we save an unbelievable amount of time compared to the movements of the second dimension. Not only time, but energy. Energy storage and use for a 3D being over a 2D being are phenomenal orders of magnitude greater. A 2D being would use all the energy it has in order to move its entire body around and through the 2D world. On the other hand, for a 3D being it takes barely any effort to lift a pencil with the arm and place it half a metre away within a second. I can scarcely imagine the image of a fourth dimensional physical being, but the energy it would possess would necessarily imply that it could move from one location in the 3D world to another in a fraction of the time it would take us to travel there. Not only that, but it would cost a fraction of the energy.

On Earth, this would look like teleportation. If we lived in a flat or apartment, we would go into the room where our shoes are, perhaps open the cupboard, pull out our shoes, put them on, go out the front door, down the stairs, out the main

door, and down the street to meet Fred, our four-dimensional friend. Fred however, if present in the apartment, would simply remove himself from our field of view in the third dimension (like we could pick up the pencil or raise our finger) pluck the shoes out of the closed cupboard while simultaneously placing himself at the end of the street in a mere moment. Funny on Earth, unimaginable in terms of space travel. What might take us more energy than we currently know how to muster for interstellar travel, could be a matter of a short and perhaps gentle 'run' (if that makes sense in four dimensions), for Fred.

I have to assume now that time wouldn't affect 4D physical beings in the same way at all. If we travel across the universe we have acceleration and time-dilation to think about. If we travel away at high speed and come back, everyone will be much older than us upon our return. However, 4D beings could seemingly teleport to one end of the galaxy and back without any time shift. They would appear to defy the 'laws' of physics.

So, perhaps prematurely wrapping up this little investigation, it seems then that what we perceive plays a large role in not just how we act, but how we *can* act. The right-angle to the physical (sensory) dimensions may well be the dimension of observation, as it cannot be touched or pointed to directly. It appears to be elusive when sought, and yet ever-present as the awareness of the seeker's world. Perhaps you can consider yourself a four-dimensional being, living in a three-dimensional world... What a bizarre idea. Coherent, I'd argue, but bizarre.

References

[1] 3D graph image from <https://www.geogebra.org/>