

# Adaptation

## Theory to Practice (Part 1)

One of the things we really like to take a crack at here at The Inclusion Club is translating theory into practice. Generally speaking, you can separate research based theory and practice into two camps. There is research and there is practice. Unfortunately, it's often the case that the two things are quite different and separate from each other. They are isolated. Which is not the way it should be! Research and theory should inform practice.



With that in mind it's a great pleasure today to introduce you to the work of a man that really does understand this and, most importantly, connects research and practice in a very positive way. He studies 'adaptation theory' and puts it into practice. His name is Yeshayahu Hutzler from Zinman College in Israel. We'll call him Shayke because his friends do!

What we are going to look at is what Shayke calls 'A Systematic Ecological Model for Adapting Physical Activities'. Don't be afraid. You'll remember that we have previously considered a few practical models for adapting activities, such as TREE and STEP. Well, Shayke's work provides a really good theoretical foundation for these models too as they are closely related. We will try here to summarise, in a practical way, the basis for Shayke's Ecological Model and explain it's application to everyday settings. At the bottom of this episode you can download a paper that explains the Ecological Model in much greater depth.

### What's the Theory?

So what's the theory behind Shayke's model? (we'll refer to it as SEMA). We are going to look at three. All three are based on the understanding that the success, or otherwise, of activities is a determinant of the individual, their environment and the actual task to be performed. You must consider all three to determine best fit.

The first is a theory called **Action Systems Theory**. Think of it this way.

Here, you have Joe. Joe is 1.7 metres tall. Weighs 81 kg. Is quick, not very well coordinated and quite strong. These are his personal and unique resources.



Now, how well Joe performs in certain tasks is dependent to a degree on these resources and how well Joe applies them. But it is also determined by the environment at any given moment. How well Joe is able to swim may depend on the temperature of the water. How well he is able to catch a moving object may depend on the wind or the surface Joe has to move on. Joe has to adapt to this too. So there is an interaction here that is critical to the task.

In addition, Joe's performance is governed too by the requirements of the task. How complex or easy it is. Throwing a dart requires fine motor skills, good balance and accuracy.



This would be different from bowling a tenpin, which requires more strength and more gross body movement. So, how well Joe is able to do these tasks is a result of the interaction between Joe and his personal resources, the environment and the requirements of the task. This is Actions Systems Theory.

It would be good if we could measure these parameters don't you think! If we can measure them then we can understand the influence one of more of the parameters have on the performance of the task and adapt and modify accordingly. Remember the model – the individual and their personal resources – the environment and it's influences – and the actual requirements of the task.

It's worth here considering for a moment the World Health Organization and their adoption of the International Classification of Functioning, Disability and Health (ICF). Adopted in 2001 the ICF has provided policy makers across the world with a more contemporary view on disability. For the first time there is a consideration of the environment in how we define disability – hooray for that! The ICF also gives us more detail on our three parameters. It identifies 'barriers' and 'facilitators'. Basically, the things that restrict participation across the three parameters and those that promote and support participation across the three parameters.

Do you see the connection to models such as TREE and STEP? These models help us identify what needs to change across functions that impact on the person, their environment and the task at hand.

Now, the good news is we can measure these parameters.

**Ecological Task Analysis** (ETA) attempts to do this. Essentially, ETA applies an instructional and assessment system to Action Systems Theory. Importantly, it also allows for experimentation and choice in decision making. So, it takes a broader view. Exploration and experimentation is important as there is no instant formula here. It's at the core of models such as TREE and STEP.

What's also very interesting here, as Shayke points out, is that there are a set of principles for understanding the relationships between environmental conditions and the resources of the individual. Without going into too much detail here, this is all about understanding how people can adapt to situations as the parameters of the task change.

Think of it this way.

If we throw a ball at Joe he will find a way to catch it.

How he adapts to catching it will depend to a large extent on how big the ball is. It's weight, It's texture and maybe, even, it's colour in contrast to its surroundings. We know that Joe is not very

well coordinated but, let's say that he can successfully catch a volleyball quite easily with two hands and sometimes with one hand.

So how successful Joe is depends on the interaction between Joe (and his resources) and the ball



But what if we change the type of ball? Poor old Joe is going to have problems here!



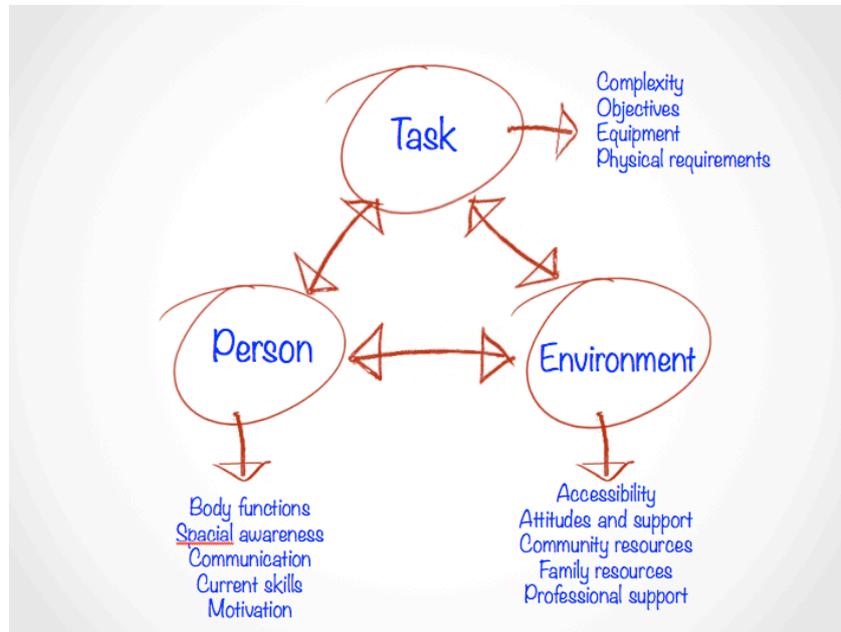
This changes the interaction a lot. This simple thing can facilitate or be a barrier to participation. This is why individualised learning programs beat the pants off predetermined programs and why it is so important to incorporate experimentation and choice into activity situations.

Moving on then to **Adaptation Theory**.

This is very similar to Action Systems Theory but goes a step or two further. Claudine Sherrill in 1995 wrote one of the seminal papers on Adaptation Theory back in 1995. She wrote:

“Our body of knowledge extends beyond skills and fitness to function, the ability to function in mainstream sport and exercise ... Now we realize that it is unjust to assess only the individual with a disability. We must assess his or her environment, or ecosystem, and identify the attitudinal, aspirational, and architectural barriers and affordances that interact to impact the learning and practice of physical activity”

Shayke has encapsulated this in a nice model that I've sketched out below.



Okay, Shayke's model. Shayke has been experimenting with ETA for many years at his centre in Israel. This is the really cool application of theory into practice.

The SEMA model is the result of this experimentation and learning over time. It differs from the original ETA model in five ways:

- 1) It links to the terminology (and approach) of the ICF
- 2) It includes criteria that can be used to assess task accomplishment
- 3) It recognises factors that limit or facilitates task accomplishment
- 4) It includes the systematic adaptation of parameters rather than only relying on experimentation, and
- 5) It encourages, but does not require, choices for selecting types of movement.

Now, we'll give you a summary of an example of how this is applied in practice – but not until the next episode! Simply go to <http://theinclusionclub.com/episodes/theory2/> for part 2.

## **Adaptation – Theory to Practice (Part 2)**

Right, we've had a look at the theoretical foundations of Shayke's model in Part 1. If you have downloaded Shayke's paper then you'll have a good understanding of the research that underpins the SEMA model.

Great, but what does this mean in practice?

A lot, actually. Let's take a step by step look at the SEMA model.

### **Step 1: Define your task**

A task can be an individual activity, such as running with a soccer ball. The outcome is simply the completion of that task. It can also be more participation focused, such as playing in a football team or a swimming competition.



### **Step 2: Define successful performance criteria**

This will depend on the task and on how you want to measure success. Success may depend on certain body movements. If you want to teach good throwing technique then your success measures may relate to body position, arm movement or hand grip. But if you want to measure the end result, then your success measure may be how far you throw in relation to a certain standard. The same with running while dribbling a soccer ball. On the ball control or time measure?

Performance criteria may also be related to participation measures, such as involvement, enjoyment or interaction with peers. Whatever the performance criteria is, this step requires you to define it.

### **Step 3: Identify barriers and Facilitators**

This is a really interesting one. Remember when we looked at the ICF and the types of barriers and facilitators that can have an impact on our three parameters – the individual, the environment and the task.

When identifying barriers and facilitators it's a challenge to know the extent to which each one interacts with another. How important is body strength in a throwing task compared to how heavy and big the ball is? How important is leg speed and gait patterns compared to how fast someone completed a 50 metre sprint?

Well, it depends on what your performance criteria is. If your performance criteria is to achieve a personal best or to win a competition then you'd say leg speed and gait were important factors. If your performance criteria was completion of the task or participation with peers, then leg speed and gait is not so important.



This may sound pretty obvious, but, so often the relationship between performance criteria and barriers and facilitators get mixed up. People are reluctant to adapt and modify because of the misconceptions about performance criteria. Moreover, there is often confusion around the impact of modifying parameters to facilitate success. Impairments can be barriers or facilitators, depending on what you are trying to achieve.

#### **Step 4: Identify performance errors**

Again, this is not always as easy as it sounds. Our textbooks and traditional coaching and teaching practices tell us that there are certain acceptable 'best ways' of doing specific tasks. Best way to kick a ball. Best way to hit a forehand in tennis. Best way to swim breaststroke. As teachers and coaches we are taught to correct people that do not conform to the 'norm' of how tasks should be completed. We apply instructional cues and give feedback to correct poor technique.

But, without a broader view of all the parameters that contribute to the performance criteria we are after, our instructional cues and feedback can be useless. This includes an understanding of how the individual interacts with the environment and the task. In Shayke's paper he gives a very good example of this:

“passing a ball in volleyball to a teammate usually requires having a steady platform. If a participant fails to pass a ball in a dynamic position, he or she would usually be instructed to pass the ball from a static position, i.e., while standing still. For individuals with a certain condition such as cerebral palsy, standing still would provide an increased barrier, as plantar flexed feet and internally rotated hips limit the base of support. In such a case, it may be easier to achieve dynamic balance rather than static balance.”



### **Step 5: Adaptation Suggestions**

This is where it all comes together and you will see the relationship of SEMA to models such as TREE and STEP. What we like about SEMA is that the actual adaptation suggestions are the result of a “critical analysis of the relationship between environmental and individual criteria...”

BINGO – we have a clear link between theory and practice! Wonderful.



Adaptation suggestions applies to all parameters – the individual, the environment and the task. For example, As mentioned previously, the trick here is to understand the interrelationships and the relative importance of each parameter to the performance criteria. If we take an individual example of a young person with hearing impairment wanting to play baseball. The performance criteria at this stage could be ‘participation with hearing peers in a baseball type activity’. You could consider providing visual cues and/or adapting your teaching style to include more manual demonstration.

These adaptations would always consider one of the Golden Rules of Inclusion – that individual adaptations should not adversely impact on the integrity of the activity for the group as a whole.

As the person gets older and more competitive there may be greater emphasis on individual technique and adaptations or coaching as the performance criteria changes. Sign language could be used and more intricate visual cues developed.

### Summary



A big lesson from this episode is really the importance of understanding the inter-relationships between the individual, their environment and the requirements of the task. That's a key to SEMA. If you can identify and measure the important variables that impact on the performance criteria that you set, then modify them in accordance with your performance criteria, then you are on the road to providing some very customized sport and activity experiences.

Thanks to Shayke Hutzler for his inspiration and cooperation in helping us share his work.