

Most Overused and Misunderstood Idea

Nancy Cooke – Okay, I picked mental models and shared mental models. I don't think we know what they are or how to measure them. There's been lots and lots of work on mental models and shared mental models but the, ah, I think the crux of the matter is the measurement and you can find as many different measures for them as you can papers on them. So that's definitely overused, least understood.

Gary Klein – The one that I'm watching is Anders Ericsson's concept of delivered practice. I think it's an important concept but when I watch people talk about it I think everybody has their own way of understanding it or describing it or describing what it is and what it can do and it's a much more modest concept than a lot of us may appreciate it. It's not taking about finding goals for practice and practicing to that level, it's really anything that people do to improve performance short of actually engaging in a task and that's a much softer concept than what I see people using when they talk about deliberate practice. So just have to be careful because the danger with any of these kinds of words and concepts is once we all think we understand what the words are, the terms are, it's very easy to lose common ground. We use the same words we think we're talking about the same thing, we're really not.

John Carroll – I wanted to mention Miller's magical number but someone from the audience already did that, but fortunately I, there are many ideas that are overused and not understood, so I'll give you my other two. And that is user centered design and participatory design. These concepts were really transformative in my career but I've noticed over the past twenty years there's been a kind of conceptual inflation and they mean less and less, to take participatory design because it's the stronger term. Participatory design requires that the user be involved in all phases of the design and have power. But one sees, especially in North America, one sees the term used to mean users were talked to, users served as subjects, really any kind of user involvement can be called participatory design, which really is comical if it wasn't so tragic because we'll never have participatory design if this is what we think it amounts to.

Christopher Wickens – Okay, I'm going to, you know, carry on my tirade from the previous category. I do think the point of five level is tremendously used and tremendously misunderstood in terms of what it really means and what Fischer's intent was the issue is of an arbitrary point along a degree or confidence. I also think effect size, a lot of people are coming to effect size as simply a measure of variance accounted for, but what effect size really matters in our human factors community as I said is whether something saves five milliseconds, fifty milliseconds, half a second or five seconds, it's the raw units of measurement that matter and these raw units need to be put in the text of an article and not relegated to the axis of a graph or to a footnote on a statistical test.

Christopher Nemeth – Thank you. I think I've got everybody, now the comments from members of the audience about the most overused misunderstood idea. Looks like a popular one, yes sir.

Audience member 1 – I have one that I hope nobody beats me up for it. I'd like to nominate situational awareness as something that...

Christopher Nemeth – situational awareness

Audience member 1 – situational awareness which seems to be offered as the reason why something happened or why an accident took place where as it actually should be a step along the process of trying to understand what happened.

Christopher Nemeth – okay, thank you for that, yes sir

Audience member 2 – Doesn't power analysis really protect you from misusing the significant level? I mean...

Christopher Nemeth – is the question for Dr. Wickens?

Audience member 2 – yea, I use your textbook in my class, but no, what I'm wondering is I've seen so many charlatans not use the point o five level to justify a bad decision and obviously I'm not saying that, but I find that significance level really is the only protection we have against bogus claims

Christopher Wickens – but why does it have to be point o five?

Audience member 2 – it doesn't, but...

Christopher Wickens – if particularly if you're doing experiment, or you're doing research or you're maybe limited in the number of subjects you can get

Audience member 2 – but then if you replicate it three or four times you're gonna end up getting a point o five level anyway

Christopher Wickens – if you aggregate the data

Audience member 2 – right

Christopher Wickens – across your applications

Audience member 2 – so meta analysis will save you from that

Christopher Wickens – yup and meta analysis, critically important tool, I agree, yea, I mean, yea,

Audience member 2 – okay

Christopher Wickens – the answers are complex, I mean you raise, and you raise a very important point about the importance of power analysis. Trying to get adequate statistical power when you can't, but you can't always get it. And when you can't get statistical power and you're wedded to the point o five level and you're wedded to words that say there's no difference when I get something greater than point o five

Audience member 2 – I mean to be more specific in the field of industrial psychology, they use poor selection tests and they claim okay, it's not a point o five but I know this predictor will work. So without some sort of backdrop or some (inaud) work, what protects you against these claims?

Christopher Wickens – well you can say point one o and you can let the reader decide that the evidence is now, its weaker evidence than it was before, but on the other hand point one o is still fairly substantial evidence, particularly if it may be producing a fairly large effect in raw units

Audience member 2 – it just seems nobody, I just want to get (inaud)

Christopher Wickens – and that's were I come to this idea of not well understood, okay, it's a bad idea, but its also people don't understood, a lot of people don't know what that point o five level really means.

Christopher Nemeth – thank you, other thoughts on most overused misunderstood idea, yes sir

Audience member 3 – I want to add on to what the previous person said about situation awareness and add a couple myself, I think, just to add on to what Gary Klein said, I think that Reason's work is, it is as you said, it opened up the field to people outside and

very easily understood, but I think one of his terms organizational or system defenses has become overused. I just don't think it's particularly well understood

Christopher Nemeth – So Jim Reason's organizational or system defenses is one of the overused misunderstood notions?

Audience member 3 – exactly, I think also, corporate culture at one time had value, I think it's become overused and misunderstood and I think crew resource management also has become, at one time it had value and now it serves as an end in and of itself to explain error in various settings and I think it has become overused

Christopher Nemeth – okay, so you would also add corporate culture and crew resource management to that list.

Audience member 3 – yes

Christopher Nemeth – thank you, yes sir

Audience member 4 – I wasn't going to say anything because I've said enough, but some of the, some of the examples, Nancy's example mental modes, situational awareness, crew resource management, they're all examples of hypothetical constructs that we've taken to the wrong level and we approach them as if they're reality when in fact they're not reality. I just had an interesting conversation with an old friend of Chris Wickens, Mike (inaud), who's talking about even episodic memory may be more of a hypothetical construct than something that really exists in reality because there are different ways to look at episodic memory that don't necessarily use the term or the conceptual basis for episodic memory and I think we do that much too often

Christopher Nemeth – so would there be an item that you'd like to add as a

Audience member 4 – no I'm not going to, just that I'm saying all of them are hypothetical constructs and that's what I think people were saying that we take hypothetical constructs too seriously

Christopher Nemeth – okay, taking hypothetical constructs too seriously and possibly leading to misunderstanding

Audience member 4 – yes

Christopher Nemeth – fair enough

Audience member 4 – using them as explanatory mechanisms

Christopher Nemeth – using as explanatory mechanisms, thank you, yes sir

Audience member 5 – I think I would add as a heuristic, actually Dr. Wickens very eloquently writes in his book about reliability and diagnosticity as (inaud) of heuristics and many human factors engineers and systems intake majors apply that term and use that term without knowing very well about the diagnosticity and the reliability as it may pertain to that particular situation

Christopher Nemeth – okay

Audience member 5 – so that is one, and the other thing too, about the point of five significance, I'm having a bit of a memory lapse here, the last two months in the journal *Science* there was a very good book which spoke about limits of statistics and they, in medicine and behavioral sciences and one of the examples they gave was the drug control study, the drug Celebrex for instance, you know it as not statistically significant its an arthritic drug, drug for arthritis and the number of people who died due to heart failure after consuming that drug was not a statistically significant one, but still that was used as a selling point before the problem was found out, so I would like to bring that particular

book to everybody's attention and if they check one of the old issues in the last eight weeks they are sure to see that in the book review section of the journal *Science*

Christopher Nemeth – book review section of the journal *Science* and this would be on the topic of statistics and they're reliability?

Audience member 5 – yes, statistics, the lack of diagnosticity

Christopher Nemeth – great, thank you