



Mark Taylor

The Effects of Ageing

BEHAVIOURAL SAFETY USER CONFERENCE 2006

Neil Budworth - Conference Chair

I'd now like to introduce our next speaker who is Mark Taylor who's a technical Director of Rider Marsh. Mark will be talking about examining the effects of age and the potential incident involvement.

Mark Taylor

Morning everyone.

Yeah can see who's had a heavy night last night cant we? Yeah? Where's Scott Russell, he looks a bit worse for wear this morning. Ok, just before I begin just a couple of points to put up on Richard Both (unclear) which I thought was a very comprehensive talk; one point I would take away from that is if Dove Sohar has identified some issues then people should pay attention to that; he's an expert in his field without a doubt.

Well today I want to talk about agent's effects on performance specifically in relation to how it could increase the likelihood of incident involvement. I just want to say this, that, I have a personal believe that age does not affect our performance and the older I get the more I believe that to be quite honest. So.....quick overview, what I would like to talk about is to examine some of the changes that are associated with aging especially now as the law has changed you, its now a breach of the law if you call somebody an old fart so people like David Harrison are ok now.

Discuss changes in relation to unsafe acts and also general changes in performance. Now many of us may have a stereotype about people becoming older and becoming obsolete in their own workplace but, but let's bear this in mind, some of the best work done by Einstein was done in his later life when he started developing his work on the theory of relativity and Ronald Regan at the beginning of his career was a couple of weeks away from his 70th birthday so age isn't necessarily a predictor of performance; some people can excel in their fields even later in life and that's one of the myths I want to dispel today.

So why are old age groups at risk, well because there are physical changes that may reduce our ability to perform in response to specif....sorry...specific parts of a task; there are also some psychological changes which may mean that individuals are more susceptible to some of the errors that Richard described earlier. Performances changes can increase likelihood of incident involvement specially in the involvement of critical tasks and more importantly individuals can be less capable of recovery. Hands up how many of you have got elderly relatives in your family? Yeah. How many of them have got kind of a young sprightly aunt or something like that you, who looks young in their appearance, very bouncy or may have fallen down the stairs, injured their hip and all of a sudden they seem to age overnight. Has anybody ever noticed that? Yeah see some hands yeah. Well that's the same true of course with occupational incidents; if somebody is older their ability to recover is vastly reduced; on that point let's go back to Ronald Regan, often the subject of mickey take by programmes such as Spitting Image when the pres...someone's stolen the president's brain type sketches; what people don't realise, before there was noticeable changes in his performance of course there was an assassination attempt in which he was hit and its documented that he lost 50% of his blood during his treatment and this is often one of the traumas that can lead to neurological damage and it was interesting to note that years later he started to stumble during public people and he wasn't even from Hull but.....but what of course happened, if you examined his rate of speech it really did slow by about 50%, if the speeches were making were 50% slower and also there was an increase in the number of errors he made when he was speaking ; at one which saying to the American public look, if you want to have the mistake that's been made for the past 4 years with the administration then you should vote for the opposition, unfortunately for Ronald

Regan this was on his second run for the presidency so it was his own administration which he was talking about so as we can see here, as an individual who suffered a trauma and never made, fully made a recovery.

Ok so again the effects of aging, noticeable decline in physical and psychological performance; decline commences from the age of 30 when performance tends to stabilise but this decline tends to be noticeable around the age of 50 to 60; for example roughly we are hearing decreases by about 3 decibels for every decade; by the age of 40 that increases to 9 decibels for every decade; so changes in performance due to both physical and psychological changes start to occur with aging.

What type of change are we taking about; well structural changes involved in the aging lead to reduction in the ability to react to changes in light, our pupil size decreases and we cant really adapt to differences in illumination; detection of detail, print and sings becomes affected simply because the lens started to thicken in the eye so we cant adjust it. Searching on location of moving objects, particularly hazardous then for somebody who has started to get a little older and is involved in night time driving were obviously the location of moving objects becomes quite critical and also possibly detection of detail.

Also the detection of auditory information in noisy environments becomes difficult. While we retain the ability for speech recognition quite often we find it very difficult to understand words when there's a noisy environment, you may have noticed this with some of your relatives; you pick up the telephone and if they're quite elderly they find it very hard to understand what you are saying over the telephone, sometimes because of the background noise.

Some of the psychological changes in aging, reduced ability in attention to select from competing information, so you know if we are trying to deal with lots of information where we can normally focus in on the thing that was most important to us, we start to lose that ability and if you think about maybe operating a control process where there may be competing alarms that again starts to have issues in terms of performance.

Another key thing is the reduced use of working memory, most of you will know this as short term memory and again people start to forget new information as it starts to come to us but they tend to have a lot, a better recognition from long terms memory. As a result of this what we will tend to see a reliant on experience and practice skills, so basically the things that have become routinised through past experience are the things that people start to rely on which is probably the reasons why when it comes to training somebody from an older age group what we'll tend to find is if we haven't done the training correctly then what people do is rely on their experience of how they did the job before, this is not really a motivational factor, it's a coping strategy due to the commented changes that have occurred.

SO again when it comes to them solving problems, when people start to get older we tend to rely more on contextual information which means basically we don't tend to deal with problems from afresh, we rely more on the situation and signs that we recognise and that can cause problems for fault diagnosis and such other activities. But age in itself is not the predictor really, I mean obviously we have these structural changes but they do vary between individuals, you cannot necessary discriminate or predict performance just on the basis of somebody's age.

There are other associated factors, take for example illness; many of us, in fact I lost my grandfather this year to Alzheimer's disease; it's a progressive degeneration of the central nervous system targeting the frontal lobe of the brain and of course people normally associate Alzheimer's, in fact it used to be called senile dementia because we normally used to associate it with aging. In fact you know, Alzheimer's can attack people at all different ages; there was some cases documented at people at the age of 29 have started to suffer the affects of Alzheimer's so it's a disease process that was associated with age. Also with aging we might be looking at cohort affects through education difference in standards, you know what one level of education a person has got many years ago is different to the education that people get today, so sometimes when we start to examine performance it could be the result of that.

Just coming back to illness a second you know, as we get older the even if our bodies are winding down a bit we may become prone to other forms of illness and course its also the treatments that are used in dealing with the effects of these illnesses that can also affect performance, you know, some of the drugs associated with diabetes can actually cause some forms of drowsiness for example so again that is not just a factor to do with age its an associated factor to do with illness.

Also as we get older, you know, our motivation tends to change, you know one time it was

maybe getting the career up and moving you know, buying the flash car, the new house and as we become older its about you know, making sure we're got provision to take us through the rest of our lives, in some cases it could just be the social factor and you know, Hull is a dock town, I am very fond of Hull as you might tell but Hull is a dock town and you know, when they broke up the national dock labour scheme many of the dockers there were quite old and you know, really due and retirement and they had the big pay out and so what did they do? Well most of them tended to go back to the same pubs they used to go to when they were working, why? Because of the social aspect, in fact many of them returned to work as contractors not because they needed the money, because they wanted the social interaction, so again you know, looking at the motivation between somebody who is older and somebody who is younger can be quite different., There are some studies that have been done of this found that you know, older people can show less performance than younger age groups until you start paying them more money then the older people tend to perform a lot better so again you know, maybe they got a bit more wise.

Another way of looking at this of course when we start talking about the affects of aging, its maybe a general reduction in the resources that we have; if you think of us as having you know, a limited amount of resource which we can apply to any particular task, what happens essentially if there is a task it gives us, it demands a certain outcome in performance so we will probably assess this at some kind of semi conscious level and we determine the amount of resource that we're going to use, this is where motivation does start to have an impact on what we're going to do so we put a lot of energy into doing a task, we do the task, we compare the outcomes, compared to the outcomes required by the task and if we're not quite there, if we're younger or you know, we're quite energetic that day then we'll pull in some of our resources so we can perform the task a lot better.

The problem of course is if this task starts to outstrip the resources that are available then we could start to show signs of underperformance ok, so the idea is that generally we might have a resource that is generally becoming less and less as we get older although at the moment the jury is still out on this one. So.....when it comes to the hypothesis and the aging effects on human error or human failure as the term is now starting to be used, you could probably recognise this model from the one that Richard put up just a while ago where we have the different types of unsafe acts but lets just generally look at the effects that aging could cause.

Firstly when it comes to more the skill based type errors such as a slips and lapses, these things tend to me motor or perceptually driven so as we start to lose our ability to use some of our auditory senses or our visual perception generally the information that we're using might be reliable, we may make mistakes there and act in accordingly. Also as our attention starts to reduce we may forget to do things and we tend to suffer more perspective memory failures. Again if you think about rule based mental strategies, these are where we use routine tasks, so again if we start relying on our past experiences, these become experience drive, that means we're going to use rules more, we're not going to look at the problem afresh, we're going to rely again more and more on our past experiences so we tend to work on you know, using good rules but probably applied in the wrong situations, again a strong reliance on contextual information here.

In terms of knowledge based mistakes as again coming back to attention and working memory which highly involved in problem solving, if this starts to be reduced then basically reducing our problem solving space, our ability to cope with new problems could become decreased, especially if its associated with an illness which is, tends to be attacking something like the brain then again for the effect our ability to cognitively reason through problems.

When we start looking at violations the story may be slightly different because I would suggest that this is primarily attitudinal based; again using prior work experience, our experience for how companies have treat us in the past is what we tend to flavour our future perceptions, beliefs about organisations and work groups again flavours our attitudes on what we do; our perception of behavioural control that's fine, do we have control over what we're doing; our perceived competency or self efficacy you know, we may have control but how well can we perform the task and also the perceived cost benefit which is more related to motivational drivers; what I want to point out at this stage is if you look to the error side, yes we can see that errors may become more likely with aging due to structural changes. If you look to the left hand side that is true of any age group; yeah, so organisational safety culture tends to have a quite a strong role in affecting performance regardless of age in my personal opinion.

So.....some key strategies just some key points for thought. One of the key things when we see people getting older and they start to realise that their performance isn't up to the task, they quite often can develop new strategies for work, they'll start to avoid the tasks that would

outstretch their performance ability; for example its known that you know, people in to their mid 60's heading towards their 70's will start to avoid night time driving for the problems I mentioned earlier but one of the key things we can do is look at that and start looking at the individual, remember we cant just take a broad brush about age and say look if you're old this is what's going to happen, what we need to say is what capabilities does this person have, so when we're looking at the type of work we're doing we need to start understanding what is the individual's capabilities and how do we match those to the job that we require them to do.

Another key thing is the effects of age can be reduced significantly by maintaining training of older workers, you know, a lot of companies fall into the trap of thinking, well person's not going to be with us for much longer so we wont put them on the training course and what you're doing there is losing a vital resource from your company and really what we should be doing is saying, well that person is as much value as anybody else within our organisation. Again when it comes to maybe person development reviews and those type of meetings, what we should be looking for and what are the motivations for this person stating at work and how does the job satisfy those things? Another key thing is let's look at the job itself; what abilities does it require and does the individual have the ability to do that job and that way we avoid discriminating against anyone.

So...in summary, change that tend to be associated with age are potential predictors of performance but age itself I would argue is not. Age is not sufficient to predict performance of incident involvement, again its some of the changes in the individuals abilities through structural changes that are the predictor. Individual cases therefore need to be judged on their own merits, we should take an individual and look at them as a person and look at their abilities to perform a task and not discriminate on the basis of age.

Again one of the things we do need to be aware of though is recovering from incidents means that older age groups can load risk, the likelihood of the recovery is far less likely if we, if we are physiology is starting to wind itself down and perhaps with the changes in (unclear) what we should look at is the legal (unclear) to examine younger age groups for risk assessment, needs to ensure that we have extended that to older age groups within our work force.

Also let's be aware there are many positive advantages of having older people working with our organisation; they have a lot of experience that they can share with people coming into industry, they tend to be more motivated for different reason and they tend to be more committed to the organisation that they work for.

Thank you very much. Is there any questions at all?

Neil Budworth

We do have time for one or two questions for Mark is there is anybody got a burning question if you can raise your hand, we'll get a mic to you. Yeah there's one there in the centre; if you can state your name and your organisation please.

Audience Member Asks Question - Unclear

Mark Taylor

Sorry, well it's a debatable point granted.

Audience Member Asks Question - Unclear

Mark Taylor

Sorry can't hear the question.

PAUSE

Mark Taylor

If you start singing I'm running of the platform I tell you.

Audience Member

You should see me in the pubs in Hull. The new legislation that has just come into place recently, the fact that you've just, the presentation that you have just given, is this not discrimination already, just the fact that we're identifying age in the work placer?

Mark Taylor

I think really discrim...discrimination comes through ignorance so we need to be aware of what aging is and how as a process it works so we can ensure that we don't discriminate so that would be my response to that question to be quite honest. You know if we don't understand about how age can be associated with structural changes, can be associated with psychological changes then how can we ensure that we don't discriminate because people say well look, people who are older are at risk, there may be some truth to that but in certain situations and individual cases. Any other questions.

Tim Marsh

Yes Roger?

Audience Member

Two questions; first of all what is the research evidence that might support your hypothesis about the impact of aging on stereotypes and the emergence of that from investigations of accidents and also do you have any comment on the efficacy of coping strategies which older people develop as we get older we develop strategies for coping with reductions in our capacities in various way?

Mark Taylor

There is a great swell of evidence about the effects of aging on performance generally; its not such a big jump to (unclear) involvement to be quite honest; the ones that are probably the more arguable issues are about whether there is a generic slow down with aging through reducing attentional resources or whether it applies to specific elements of certain tasks because of the way our psychology and our ability to cognitively process types of information changes; that's where the debate is at the moment. There's a book actually that I would recommend to anyone, very good chapter that covers on this is by Steve Westmill, I believe he's also from Aston University on cognitive performance and workload hours, (unclear) research evidence for themselves. In terms of the efficacy at the moment as far as I am aware most of the studies tend to be lab based so we really start to looking at some ecological, (unclear) studies to be quite honest and that's all I can say on that topic at the moment Roger, thank you. Any other questions?

Neil Budworth

Ok we should draw a halt there, you will have a chance to question Mark again at the end of the next session. Just before we break for coffee can I remind all those who are going to receive awards this afternoon and are going to go in to collect them to register their names at the ROSPA registration desk in the Coalport foyer during the coffee break. If we can now break for coffee and be back here by 11.20 sharp please thank you.