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Citation for published version (APA):

de Boer, R. J. (2011). *Seneca's error: the intervening effect of emotions on mental model preservation*. Paper presented at Symposium on Human Factors for Future Aviation 2011, Amsterdam, .

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Seneca's Error:

The Intervening Effect of Emotions on Mental Model Preservation

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This paper aims to describe how we change our mind. As any human knows from his or her own experience, this does not always come naturally to us. This dissertation therefore aims to find fault in Seneca's assertion: not only to err is human, but it is also human to persist in this mistake despite evidence to the contrary. In this paper I will argue that changing one's mind is regulated through emotions, building on Damasio's thoughts that emotions are not a luxury, but essential to rational thinking and normal behavior. His landmark book "Descartes' Error" (Damasio and Sutherland 1996) inspired the title of the current work. This research has been triggered by my experience in industry, where I have been lucky enough to have collaborated with many talented, friendly and rather stubborn people for over 20 years.

In psychology, it is assumed that humans hold simplified, holistic representations of reality in their memory from which they execute thinking processes. These so called mental models are created subconsciously and are relatively stable, and therefore updated only intermittently. Under dynamic circumstances (as in the real world) this leads to a discrepancy between the mental model and reality. Recent literature from the domain of social psychology has suggested that emotions are elicited when the divergence between reality and the mental model becomes too large. The emotion may prompt the individual to reflect on his current path of thinking, thereby triggering the demise of the mental model. Alternatively, the emotion may decay without further consequences, in which case the mental model is preserved.

This paper describes the intervening effect of emotions on mental model preservation. It encompasses two main points:

- A description of this effect as identified through research of the relevant literature;
- An experimental confirmation of this effect.

The experimental validation is based on a research design for which we have shown that we can generate circumstances for a subject that will allow him to establish a Mental Model about a task. After we have been able to ascertain the establishment of the Mental Model, we present stimuli that challenge it. An experiment has been specifically devised and conducted to this end. Both the cognitive and emotional responses are monitored and have been correlated. The experiment has been run 80 times with professionals and engineering students.

The experiment confirms the predicted results. There were significantly more emotional reactions just prior to mental model demise. As expected, not all error messages gave rise to an emotion. For some subjects the initial error message was disregarded, in other cases the error messages further along were ignored.

Acknowledgement: This research is undertaken in the context of PhD research at the Delft University of Technology and funded by Blue Wave Consulting Company b.v.

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