

Response to the commentary ‘A question of our marketing or our preconceptions’

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Our paper ‘A strategy for human factors/ergonomics: developing the discipline and profession’ (Dul *et al.* 2012) was intended to suggest directions for and to stimulate discussions in the human factors/ergonomics (HFE) community on the future of our field. We believe that discussing the future is an urgent endeavour, as – after decades of existence – in many parts of the world HFE is often under-recognised, ill-understood and under-utilised. In some parts of the world, there is even a risk of decline for HFE. We are glad that several IEA federated societies have picked up the challenge of organising discussions about our paper with their members. We are also glad that *Ergonomics* provides a forum for debate, and we welcome Nathanael and Marmaras’ Commentary on our paper.

The authors of the Commentary raise additional perspectives on our proposed strategy and our description of high-quality HFE. In this response we do not comment on all points raised by the authors (which does not necessarily mean we agree with them all), but we react to what we consider to be two major issues: (1) external versus internal focus and (2) consequences of emphasising high-quality HFE.

External versus internal focus

Our proposed strategy has both an external and an internal focus that is formulated as follows: ‘To strengthen the demand for and the application of high-quality HFE . . .’. We do not agree with the suggestion of the authors of the Commentary that our proposed strategy has merely an external focus. The proposed strategy and its associated actions advocate a balanced approach between an *external* focus to make stakeholders aware of the values of HFE, and an *internal* focus for developing the discipline towards ‘high-quality HFE’. We provide specific suggestions for the external focus including communicating with specific stakeholders about the value of high-quality HFE using the language of the stakeholder, building partnerships with these stakeholders and their representing organisations, and educating stakeholders to raise awareness of high-quality HFE and its contributions to system design. We also provide specific suggestions for action related to the internal focus including enhancing the education of HFE specialists to apply high-quality HFE, and ensuring high quality standards for HFE research, HFE applications and HFE specialists. The authors of the Commentary describe the intended external focus in words like ‘marketing’, ‘labelling’ or even ‘evangelising’ and ‘rhetoric’. It is a misunderstanding that our external focus is a kind of branding of the discipline. It is far more profound as it focuses on the stakeholder’s *understanding* of the *value* of HFE to promote its demand and application.

More importantly, the authors of the Commentary suggest that the strategy should focus more on internal discussions with the aim to revise HFE’s ‘preconceptions’ rather than having an external focus. However, we think that an external focus is urgently needed before it is too late! Time and time again the global HFE community is confronted with misunderstandings and limited views about our field. This is particularly risky if mis-informed or ill-informed stakeholders are powerful, such as decision makers involved in system design, purchasing and implementation. A recent cover story of the *Harvard Business Review* (2012), one of the most influential management journals, entitled ‘The value of happiness: how employee well-being drives profits’, illustrates this need. The journal envisions that psychology has to play a role in joint optimisation of well-being and performance; they do not mention our field although this is the exact aim of our discipline. Similarly, a recent publication about the future of work reports on the results of discussions of a consortium of 200 executives around the world, and emphasised the role for Human Resource Management to shape the future workplace (Gratton 2011). Others are not to be blamed for this. We must develop an external focus to promote

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the value of our discipline. It would be a major mistake if we continue to have only internal discussions on 'who we are or should be' or on 'how we work or should work'. Focusing or even limiting the strategy to internal issues, as suggested by the authors of the Commentary, is risky as other disciplines would fill the gap by extending their focus, but without delivering the richness of high-quality HFE. We should learn the hard lessons from the development of HCI in the 1980s that became a separate discipline.

Consequences of emphasising high-quality HFE

In our paper we emphasise high-quality HFE, which means that the three core elements of HFE – systems approach, design driven and joint performance and well-being outcomes – must be considered when defining problems and formulating solutions. The authors of the Commentary start an interesting discussion about some consequences of this choice.

First they suggest that an emphasis on systems and design will require a change in the philosophy of science underlying our discipline. In their view, the emphasis on systems and design requires a departure from 'positivist' and 'reductionist' approaches: 'The proposed shift has to do with the philosophy of the discipline that, in our view, ought not continue to adhere to the positivist/reductionist paradigm.' (Nathanael and Marmaras, 2012, p. 1615). These – what they call 'analytical' – approaches are currently, arguably, the most common scientific approaches in our and other disciplines. They aim to formulate generalisable propositions about relations between (parts of) systems, and testing them in laboratory or natural settings. Instead, the commentary authors propose a 'methodological' orientation in research, presumably aiming to better understand interventions and the design of complex systems. However, we do not see that the analytical and methodological orientations are antithetical, and a shift to more systems-oriented, holistic and design thinking does not favour either. HFE both needs to have laws or theories to understand complex systems, and also effective methodologies for design. As we state in the proposed strategy, HFE specialists need on the one hand to have analytical knowledge and competencies regarding relationships between humans and other system parts, and on the other hand methodological knowledge and competencies regarding analysing systems, acting on situations, designing and assessing systems, organising and managing participatory approaches, and redesigning and continuously improving systems. We do acknowledge that currently limited HFE approaches with limited focus on the systems approach or design exist, but changing our philosophy of science by abandoning the 'positivist' and 'reductionist' approaches and embracing the methodological approach seems somewhat overdone, and not acceptable to a large part of the HFE community. We think that in HFE there is room for both. Nevertheless, discussions on the philosophical principles underlying the discipline are valuable for any applied science, including ours.

Second, the authors comment on the core characteristic of joint optimisation of performance and well-being. Indeed this is seemingly a simple but essentially complex and fundamental aim of HFE that is not always well presented or even routinely recognised by the HFE community. We therefore felt it imperative to re-state this core principle. It requires evaluation of short term and long term effects, clear definitions of systems boundaries, as well as trade-offs between different dimensions of well-being and performance. We agree that there is an 'easy part of synergetic optimisation', where both performance and well-being point in the same direction, and a more difficult part with contradictions and conflicts that require trade-offs. For example, Larco (2010) showed that by proper positioning of products in warehouses, both picking performance (less picking time) and well being (less discomfort) can increase simultaneously, and that further improvements require trade-offs between the two outcomes. At the same time he showed that in current warehouses there is plenty of room for 'win-win' improvements. This may be true for other systems as well. Neumann and Dul (2010) reviewed 38 empirical studies that measured both human outcomes and system outcomes of interventions, and found that in the vast majority of studies (87%) 'win-win' outcomes were reported. Therefore, we are less pessimistic about the feasibility of reaching joint goals than the authors of the Commentary who state that: 'Apart from a relatively limited number of cases in which such synergistic joint optimization can clearly be demonstrated, in most real world situation this aim is either infeasible or more importantly indefinable'. In fact we just do not believe the aim is neither infeasible nor indefinable.

In conclusion, the Commentary elaborates a number of issues that were raised in our paper. It is a challenging and valuable contribution to the discussion about the future of HFE and stimulates important reflection. We thank the authors for their efforts to formulate their views, and we hope that they have inspired other members of the HFE community to continue the discussion about the strategy and its implementation.

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