

# **Positive Computing and the design of systems that support human autonomy**

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Artificial intelligence systems are changing the way we live. But what kind of changes do we, users and creators, want? Is increased productivity enough, or can we expect more from technology? Positive Computing is a framework used to inform the design of new technologies that support psychological wellbeing and human potential. One of the determinants of wellbeing is human autonomy. Positive computing, uses a host of psychological evidence on how important a sense of autonomy is and how we can design for it.

Artificial Intelligence systems, like all technologies, affect the way we behave, feel and think. Generally we have used AI to increase productivity, helping people achieve more in less time, or eliminating the need for human effort altogether. As systems become more intelligent technologies can take charge of more responsibilities. But there is increasing evidence that the impact these new technologies have on health and psychological wellbeing is not always positive; the relationship is at least very complex.

One of the psychological factors most directly influenced by intelligent systems is autonomy. Engineers have been thinking about autonomous *systems* for years, but attention to the impact of systems on *human autonomy* has been scarce.

Consider this. How did you feel last time your supervisor forced you to do something that you thought made no sense? Could he have communicated better? How would you feel if the computer did the same? Psychologists, economists and management researchers have accumulated enough evidence of the negative effects of the lack of autonomy on human motivation and wellbeing (Gagné, 2014). The impact of technologies in the workplace is also clear: Information systems that reduce workers' sense of control or competence also have a negative impact on their job satisfaction and engagement (Bala & Venkatesh, 2013).

Human-computer interaction researchers are considering the impact that computer systems have on wellbeing. This is an area we call Positive Computing: the design of technologies to support wellbeing and human potential (R. Calvo & Peters, 2014). One type of positive computing application are those explicitly designed to promote a factor known to have a positive impact on wellbeing and mental health (R. A. Calvo, Dinakar, Picard, & Maes, 2016) such as positive psychology interventions. Another type includes systems designed to reduce the risk of a negative impact (i.e. preventative): for example, a social network designed using AI or natural language processing to reduce trolling or anti-social behavior. Finally, there are systems that are not used in order to promote wellbeing, but have elements known to support it. For example, a decision support system that takes human psychology into consideration.

What are these elements that support wellbeing? Self-determination Theory (Deci & Ryan, 1985; Ryan, Rigby, & Przybylski, 2006) is one of the psychological theories explaining them: human autonomy (a feeling of agency and being the origin of one's own behaviors), competence (feeling able) and relatedness (meaningful connections to others, feeling part of a community). By evaluating our technology against wellbeing models such as autonomy, competence and relatedness, we can better understand how they impact user wellbeing and we can iterate our designs accordingly.

If we want our technologies to have a positive impact on people's life--if we want our work to be recognized as improving worldwide wellbeing--we need to design for it. We can start doing this by making sure the AI elements we introduce support human autonomy and sense of competence.

## **References**

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