

Using smartwatch-based body sensors to measure creativity and performance in COINs

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We introduce a novel device based on commercially available smartwatches to measure happiness of the wearer. Through individual energy measured by the accelerometer, heart rate measured by a heart rate sensor, light level, and location tracked by the GPS of the attached smartphone, we are able to predict individual mood (Gloor 2017). We conducted an experiment at a design sprint workshop over three days. Twenty-five people volunteered to participate, fifteen of those were equipped with our smartwatch based body sensor, the remaining ten persons acted as control group without body sensing device. Besides collecting heart rate, acceleration data, light level and location as well as mood state and mental activation from the fifteen people with our body sensors, we asked every participant to fill out a survey at the end of each day to assess their individual creativity and performance and participate in a Neo-FFI personality test (Costa, P. T., & McCrae, R. R. 1992).

For activation and mood state the participants were polled around 8 times per day, immediately after each phase of the workshop. For creativity and performance, the participants were asked to fill out a survey at the end of each day. All other body signals were measured automatically in 15 minute intervals.

During the experiment, we were able to collect around 2600 tuples of body signals, 370 samples of the mood state and mental activation and 53 answered surveys.

The goal of our research is to identify factors that influence creativity, productivity, activation and mood states in order to empower COINs to collaborate more effectively. Examining the relationship between creativity as dependent variable and activation and happiness as independent variables, we found that high values of activation correlate negatively with the perceived creativity of individuals. Additionally, choosing productivity as our dependent variable we found that activation also correlates negatively with productivity. Both regressions were significant at the 5 percent level. Happiness itself seems to have no significant influence on creativity or performance. With the collected data, we expect to find more predictors for creativity and performance when analysing the body signals of the participants. Moreover, through the results of the personality test we try to identify which personality traits influence creativity and performance. Table 1 summarizes our preliminary findings.

Table 1. Table captions have no end punctuation and no period after the table number

	Creativity	Productivity
Activation	-2,038842121*	-2,078490304*
Happiness	-0,142474611300812	-0,656881225
Days of treatment	0,151651808	0,14619282
Constant	5,59530901868954**	6,716188349**
N	21	21

* Significant at 5 percent level; ** Significant at 1 percent level

We will also introduce results of a second experiment, where fifteen conference participants were wearing the happimeter smartwatch during a one-day conference in Poland with 650 participants. We will correlate the satisfaction of the participants based on a survey with their happiness measured through the happimeter.

References

1. Costa, P. T., & McCrae, R. R. (1992). Normal personality assessment in clinical practice: The NEO Personality Inventory. *Psychological assessment*, 4(1), 5.
2. Gloor, P. (2017) Consistent Excitement Correlates with Happiness - Predicting Mood Through Body Sensing with Smartwatches ICKN White Paper, January 2017s