Summary

The self-measuring delinquent

An exploratory study of technological self-measurement methods within the judicial context

Why this report?

Quantifying personal characteristics with help of technological devices, such as smartwatches and smartphones, has become a common activity among people over the past years. In the field of criminal justice, there is an increasing interest in these techniques. Self-measurement equipment could potentially contribute to tailor-made treatment and supervision and could possibly 'empower' individuals. This report investigates how technological self-measurement equipment could enrich judicial processes. At the same time, we have highlighted potential risks related to technological self-measurement methods.

For whom is this report intended?

This report is aimed at everyone working in the criminal justice system, or otherwise involved in targeting problem behavior (e.g., mental health care, youth mental health care, forensic psychiatry). This report is also relevant for scientists who are interested in innovative technology in relation to problem behavior and developers of technological self-measurement methods.

The study

This report provides an assessment of technological self-measurement methods for the judicial context in the following areas: offenders' autonomy and treatment options, security within correctional institutions and supervision by the Probation Service. In this report we use the following definition of the term self-measurement: the real-time measurement of personal characteristics and activities using technological measurement methods. Self-measurement could serve different goals: to gain insight into individual patterns, as an additional tool for regular treatment and for signaling (e.g., use of GPS technology). Four types of self-measurement equipment can be distinguished: wearables (wearable accessories such as a wrist strap), carriables (applications on a mobile device such as telephone), domotica (equipment in the living environment, for example smart cameras that respond to movement) and insideables or implantables (for example a chip inside the body that measures glucose level).

Research questions and methods

In order to explore the potential and limitations of self-measurement equipment within the judicial context, the following research questions were formulated:

1 How are self-measurement methods currently used in healthcare?
2 Which healthcare applications of self-measurement methods are promising for (transformation to and) application in the judicial context?
3 What risks should we consider with regard to self-measurement methods within the judicial setting?
4 What is needed to actually implement self-measurement methods in the judicial context?

To answer these questions a systematic literature search was carried out. In addition, online sources and input from participants of the Wearables in Practice (WIP)

group – a network of scientists, users and developers who are interested in the use of self-measurement methods – were used.

Main objective of this report
This report provides an assessment of possible applications of technological self-measurement methods in the judicial context. Directions are given and concrete examples for application in the judicial setting are presented. The actual implementation of technological self-measurement methods is beyond the scope of this report and specifically requires scientific research and scrutiny of privacy aspect.

Technological self-measurement methods in healthcare
A systematic search was conducted to investigate how technological self-measurement methods are currently used within (mental) health care. Literature shows that mainly wearables are used within healthcare, for example in the context of lifestyle factors, such as exercise, sleep and nutrition, as well as for monitoring cardiovascular disorders. In mental health care, mainly carriables (smartphone applications) are used to support psychological or psychiatric treatment.

The 'self-measuring' delinquent
In the judicial context, information about an individual is generally gathered through self-report questionnaires, observational data and file record information. Technological self-measurement methods can be considered an additional source of information to gain more insight in someone's behavior. This kind of methods can enrich the judicial context in various ways:

To enhance the autonomy of delinquents and enrich treatment options
Offenders' autonomy can be promoted through the use of relatively simple self-measurement methods to enable them to monitor lifestyle factors, such as measuring movement with a pedometer to gain insight in and promote physical activity and to also indirectly improve mental health. Offenders' autonomy can also be promoted by supporting regular treatment with mobile applications. In addition, treatment can potentially be more personalized by, for example, the use of a wristband that could indicate increased stress based upon one's physiological activity. This might enable individuals to better regulate their behavior.

To enhance security in correctional institutions
Domotica applications in correctional institutions could potentially increase the security and safety of detainees, for example by detecting a suicide attempt with the help of smart cameras that measure a person's physiological activity or the introduction of smart sensors that could control the climate (light, oxygen) on the ward. These types of applications can also indirectly increase the security of other detainees and staff members.

To support Probation Supervision
Mobile applications have the potential to support supervision and support during probation. These applications not only offer the ability to track online information about location, but also provide the option to regularly ask an individual to report on emotions and behavior and – if necessary – provide online help to the individual.

Risks and limitations
The use of technological self-measurement methods in the judicial context is not without risks. The most important issues are related to the equipment itself and the way in which this technological equipment might be used. With regard to the equip-

ment itself, many manufacturers do not invest much in reliability and validity, certification and (data) security of technological self-measurement methods. As a result, the accuracy and safety of self-measuring methods is not always guaranteed. The way in which technological self-measuring equipment might be used also involves risks. First of all, the purpose of using technological self-measurement methods must be made clear. The idea of 'big brother is watching you' may develop when the aim of self-measuring is not clearly communicated. Furthermore, we should be careful when it comes to interpreting data collected with self-measurement methods. This certainly holds for physiological processes measured with self-measurement methods. In addition, we must be aware that users can manipulate data, be it consciously or unconsciously. This emphasizes the importance of using data obtained with technological self-measurement methods as much as possible in the context of other sources of information in order to give meaning to the data obtained. Finally, not every individual will have the capacities to conduct self-measurement and this raises the question when it is justified to impose self-measurement.

Recommendations for research and practice

This report brings forth a number of recommendations for research and practice.

1 Investigate the needs and wishes of end-users within judicial practice before introducing technological self-measurement methods.
2 Promote scientific research to study the reliability and validity of self-measurement equipment and further investigate the presumed mechanisms for which the self-measurement method might be used (for example, predicting aggressive behavior based on physiological activity).
3 Investigate which existing self-measurement methods match the wishes and needs of practice. Also examine the usefulness of relatively simple and reliable self-measurement methods, such as a pedometer, for judicial practice.
4 Is there a lack of good methods? Consider the option to development a new self-measuring method in cooperation with other relevant parties.
5 Support the professionalization of a collaboration network.
6 Introduce self-measurement methods to highly motivated individuals/employees in order to create support for wider application.
7 Investigate the possibility to overcome ICT restrictions inside and outside correctional institutions, while maintaining a secure ICT infrastructure.