



# **Innovation in Probation Services: behavioural change in offenders with e-guidance**

Evaluation of a feasibility pilot with (criminal) youngsters.

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## Innovation in Probation Services: behavioural change in offenders with e-guidance<sup>1 2</sup>

### 1. Introduction

An important goal of sanctions and measures is to decrease chances that convicted offenders will return to criminal behaviour. In order to reduce recidivism, the prison system and probation organisations try to change the behaviour of offenders. Current methods that aim to do so, such as risk assessment instruments, probation supervision and behavioural interventions, are based on scientific insights. The results of these methods are fairly consistent, but limited. International research suggests that effective behavioural interventions with offenders generally lead to approximately 10-25% less recidivism but sometimes also have no, or even negative, effects. As Impact R&D has extensive experience researching the impact of interventions on behaviour, we decided to investigate how current results could be improved. During brainstorm sessions with innovative thinkers, we asked ourselves to what extent modern technological developments could make a difference. One of our findings is 'e-guidance' for youngsters that are under supervision of Juvenile Probation Services. In this article we explain what e-guidance entails and why it can be an important addition to face-to-face contact. We present the results of a recently conducted pilot with (offending) boys and their supervisors and conclude with a discussion of the results.

### 2. Juveniles and behavioural change

Behavioural change requires, at the very least, motivation, time, attention, practice and feedback. Motivation is required to even consider making a change. Time and attention are needed to acquire new knowledge and skills, practice helps fully integrate the behaviour and feedback indicates what is going well and what can be improved. This means that, as sanctions are usually imposed for a limited amount of time, there is often not enough time to teach offenders new behaviour during the implementation of penalties and measures. This is a particular stumbling block when it comes to youngsters for neurological reasons.

Many regions in the brains of adolescents (especially the frontal cortical neural systems) are still developing, meaning they have less cognitive control than adults when it comes to attention, thoughts and behaviour. They display more risky behaviour than adults; as they age a shift takes place from primarily self-oriented behaviour to behaviour that is focused on others, more pro-social behaviour. Neurological research increasingly shows that adolescence is a developmental period in which the degree of cognitive engagement is relatively *flexible*: adolescents can change focus more quickly than adults. This may explain why, when speaking with their probation supervisor, adolescents may genuinely intend to change their behaviour (for example stop skipping class, spend time with different friends), but change their goals when they are in a different environment.

In other words: even youngsters that want to change their offending behaviour often do not stick to the agreements made with their supervisors, because, among other reasons, their goals change when they are in a different environment and, in part therefore, they give the intended behaviour insufficient time, attention and practice.

This is what science tells us. In practice, however, this knowledge is underutilised. For example, supervisors with the Juvenile Probation Services try to stimulate intended behaviour, but often do not have more than an hour (or less) direct contact with their pupil. Although pupils occasionally also

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meet with a psychologist or training group, the amount of contact hours between youngsters and their supervisors is limited. Outside of these contact hours, the youngster is expected to stick to their agreements with the supervisor and practice the intended behaviour. However, even if the youngster genuinely plans to honour their commitment, this does not always work out. Perhaps they are simply unable to (yet), or their goal changes when they are in a different environment: their intended goal disappears like snow in the sun when they leave their supervisor. Adults are also familiar with this behaviour: the inspiration derived from a course tends to wane upon returning to the daily work environment.

In order to achieve the intended behaviour, it would be beneficial if the youngster continues to give attention to his goal and practices the intended behaviour, even upon returning to his own environment, thereby ingraining the new behaviour and further developing pro-social neurological connections. This is where modern technology can play a role. We can use e-guidance to send messages via mobile phones, reminding youngsters of their goals.

### **3. What is e-guidance?**

E-guidance is the influencing of behaviour via automated messages to digital systems, such as a computer or mobile phone. The objective is that the person receiving messages is motivated and stimulated to achieve individual goals. The messages remind youngsters of their goals, even when they are in a different environment, thereby increasing chances that the new behaviour is practiced. This bolsters the work of supervisors and increases the likelihood of the desired behavioural change. Supervision is supplemented with the digital messages, without the supervisor having to coordinate them. This use of technology means that supervision can be enhanced at a relatively low cost. It is in no way intended to be a replacement of the supervisor.

Behavioural change is complicated, especially with these target groups, and automated and digital messages alone are not expected to be sufficient; a personal supervisor will be necessary to provide individual diagnostics and an important portion of the pedagogical and educational components.

### **4. Theoretical Context**

The content of e-guidance is based on proven effective methods from criminology and psychology. The What Works-principles from criminology are followed, as is done by juvenile and adult probation services in the Netherlands (see Bosker, Witteman and Hermanns, 2013). First, the risk principle is followed, by providing the intervention to youngsters with a medium or high risk of recidivism (based on the risk assessment done by Juvenile Probation Services). Second, the needs principle is followed. Messages are customised to individual dynamic criminogenic factors. This means messages can differ per person. Third, the responsivity principle is followed, by taking into account personal characteristics, preferences and situations. For example, when sending messages, the system takes into account whether the participant is a 'morning person' or a 'night person,' and it can remind participants of personal agreements. Moreover, participants can choose their learning goal together with their supervisor (this must be a criminogenic goal). The content of the messages is created using elements from psychology, primarily from cognitive behavioural therapy and positive psychology. They incorporate assignments that are proven to be effective. The messages include psycho-education, awareness via monitoring and writing assignments, relaxation exercises, improving self-image via positive self-verbalisation and behavioural experiments aimed at individual learning goals.

E-guidance is based on evidence-based methods, but uses new technology. There is an increasing amount of research being done into whether behavioural change is possible via automated telephone messages instead of, or complementary to, face-to-face contact with a supervisor, primarily in the field of mental health care. A meta-analysis of behavioural change via portable devices (telephones and laptops) shows that these have a small to medium effect on mental health and psychological wellbeing, and that this is consistent for a variety of outcome measures, such as symptoms of depression, posttraumatic stress, burnout, addiction, eating disorders and panic disorders (Versluis, Verkuil, Spinhoven, Van der Ploeg, & Brosschot, 2016; Ruwaard, 2012). Moreover, a recent dissertation (Pijnenborg, 2016) concluded that a system of text messages – called cognitive prosthetics – helped schizophrenic patients in the Netherlands stick to their agreements with carers and with activation. Possible explanations for these good results were: 1) patients can practice in their everyday environment instead of in the supervisor's or carer's office, 2) patients are reminded

of their learning goals more often than only during their appointment with the supervisor or carer, 3) patients thus practice their new behaviour much more often, which is necessary to achieve behavioural change, 4) the behavioural change is not dependent on the time and place of the supervisor or carer (it continues when the supervisor or carer is not available) and 5) patients can retrieve old messages at any time (Versluis et al, 2016; Danaher, Bendryen, Seeley, Tyler & Woolley, 2015). The costs of the intervention are low because the development of a computer system and telephone costs are limited and there are few personal costs. However, patients do need access to a mobile phone (this turned out not to be a problem for young offenders). Furthermore, mobile phones are not only suitable for behavioural change, but also for monitoring and evaluation: digital questionnaires can easily be filled in on the phone. The phone could also be used to monitor the location of patients (Saeb, Mohr & Reis, 2016) and, for example, to send a signal when they find themselves in risk zones (we did not do this because we wanted to create a motivating behavioural influencing system and not a controlling system). The system could also be used for follow-up action: when the work of the supervisor is concluded, mobile supervision could be continued (Bahr, Charrington and Erickson, 2016). In short: technological developments make it possible to expand cognitive and behavioural change, to motivate behaviour, to monitor and to provide aftercare.

There may also be risks involved in using modern technology for supervision. For instance, in worst case scenarios, an increase in budget cuts could lead to a situation in which offenders are only supervised via mobile phones and ankle braces, without ever seeing a supervisor, entailing a shift in focus from reintegration to control; a movement that is described in Belgium (Beyens and Roosen, 2013). We also see this risk and this is not our intended outcome. The effect of mobile supervision is promising, but research suggests that it is more effective when combined with face-to-face contact (Versluis, Verkuil, Spinhovven, Van der Ploeg, Brosschot, 2016). In our opinion, the supervisor continues to play an important role, particularly in motivating the patient to change their behaviour. Moreover, problems may persist following online treatments, necessitating a continuation (Ruwaard, 2012) in which the supervisor plays an important role in the diagnosis and possible follow-up treatment.

Research into online therapy, which has used since the last century, in which patients receive therapy via email without ever meeting a therapist, shows that this form is at least as effective as face-to-face therapy. This has been proven with regards to the treatment of posttraumatic stress, depression, panic attacks, stress and bulimia (Ruwaard, 2012). Benefits of not seeing a therapist seem to be that it is easier to achieve a good programme-integrity (if the therapist sees the patient there is a greater chance that the conversation will stray from the topics that should be discussed in accordance with the treatment guideline). (Ruwaard, Lange, Bouwman, Broeksteeg and Schrieken, 2007). Moreover, research into mobile phone usage suggests that youngsters are more willing to share their feelings and thoughts, than when they have one-on-one contact with a supervisor. In this sense, technology can expand treatment relations and improve the continuity of care, by offering a faster and easier method of communication (Batastini, in press).

There have also been good experiences in the field of crime internationally (Burraston, Charrington & Bahr, 2010; Fjeldsoe, Marshall & Miller, 2009). This often entailed simple monitoring of offenders as a follow-up to cognitive training. For example, this took place by asking the question 'How are you?' via a computerised telephone system, sometimes followed by some short feedback (Andersson, Vasiljevic, Hoglund, Ojehagen and Berglund, 2014).

As far as we know, the method that we have developed does not exist yet, for this target group, in the Netherlands or elsewhere. It has the following characteristics: 1) our system is founded on evidence-based methods from criminology and psychology, aimed at behavioural change, 2) the system is computerised, features standardised messages, but –different to most other methods – our system also includes a large portion of customised messages, even if they are automated, 3) the system complements face-to-face supervision.

## **5. Development for juvenile offenders**

To determine whether e-guidance for offenders is indeed feasible, Impact R&D has developed a system. Every year, Impact spends a portion of its revenue on development and innovation, as part of her social responsibility. A portion of the costs were subsidised by the Dutch Ministry of Safety and Justice.

The first test version was developed for boys under supervision of the Dutch Juvenile Probation Services (supervision in the context of an imposed Juvenile Probation Supervision or Intensive Juvenile Probation Supervision) and boys that had voluntarily requested help at a youth care facility. In the future, content could be customised for a range of target groups (for girls, adults, or for employees with a specific learning goal). The system was developed based on criminological and psychological knowledge from international scientific research. The theoretical foundation of the messages was developed using effective methods for behavioural change: cognitive behavioural therapy, positive psychology, motivational conversation and directive therapy.

We moved beyond conventional e-guidance in health care by not only automating the messages, but also customising them, in order to accommodate individual criminogenic factors and personal problems and situations. As such, messages are aimed at criminogenic factors and general motivation as well as at the personal problems, learning styles and situations of individual youngsters. The messages differ in form: they can include motivating texts, memories, questions or videos. The participant's network (family, partner, friends) can also be involved. Text and video messages are sent automatically and securely to the youngsters via the computer. It is possible to temporarily stop the messages or to adjust them if necessary. For the test phase we chose a period of three months during which the youngsters received messages, more often in the beginning (on average five times per week) than in the end, and on different days and at different times. Messages feature assignments, memories, psycho-education and inspiring messages. A number of these are interactive, meaning that the youngsters not only receive messages but can also react to the questions that the system asks them. Depending on their answer, this leads to a follow-up, for example an encouragement, or a query as to whether the participant would like to contact a buddy. The youngsters can decide at the start which learning goal they want to receive messages for. The tone of the messages is positive and motivating to avoid experiences of failure. Furthermore, factors such as the age, experience and cognitive capacity of youngsters are taken into consideration in composing the messages.

Messages are sent from a virtual person: Sarah, a name that is seen as neutral and trustworthy across many cultures and religions.

Within the e-coaching system it is also possible to engage the supervisor or a 'supporter.' The 'supporter,' a family member, friend or acquaintance, can be assigned by the youngster and this person is given the opportunity to compose a personal motivating message for the youngster, via text or video. At a specific, unexpected moment the youngster will receive this message. For example, when the youngster stops responding or indicates that he is not doing well.

Supervisors and youngsters under supervision of the Juvenile Probation Service were consulted with during development, and their questions and suggestions were taken into consideration. For example, the extent to which messages should be differentiated based on cultural background was discussed. Based on the literature and discussions with supervisors and psychologists, also with different cultural backgrounds, we concluded that differentiation based on culture was unnecessary. This is because the messages are motivating and stimulating in tone, which appeals to all cultures.

## **6. The (results of the) pilot**

To test the feasibility, implementation and experiences of e-guidance a pilot was carried out. Because this was an innovative project, it was not clear beforehand whether the envisioned system could be developed or if implementation with this target group was feasible. For this reason, it was decided not to develop a large and expensive system or to implement it nationally, but to first develop and evaluate a test version. As such, the test was aimed at implementation. The most important questions were:

1. is it possible to develop an e-guidance system for youngsters with (criminal) problems, both technologically and with regards to psychological and pedagogical content;
2. if this is the case, can such a system be implemented? (do the youngsters have phones with internet access, can they be reached, do they respond to questions); and
3. what are the first impressions with regards to the usability and possible results, in the eyes of youngsters and their supervisors?

The technology was developed by Noterik BV, a software company that is heavily involved in innovation and development. A system was built that could test psychological models and

methodology with regards to the interaction with young offenders via text messages complemented by hyperlinks to (video)content and surveys online. A simple functional model was designed for the development of this test system. This model went through a number of iterations during the two test phases, after which a definitive model was chosen with which the actual test was conducted.

The content of the messages was developed by an international team of psychologists and technologists.

The test was conducted with 46 boys, of which 35 were under supervision of Juvenile Probation Services and 11 had voluntarily requested help at an institution for social work and child protection. The youngsters under supervision of Juvenile Probation were on average 17 years old and the youngsters with voluntary help were on average 20 years old. They were of various cultural backgrounds. Furthermore, 20 supervisors took part in the pilot.

The analysis of text message traffic was based on all data from our own system as well as that of the text message provider. Various methods were used to analyse the opinions of youngsters and supervisors:

1. Evaluation of digital surveys that youngsters took before and after the e-guidance (N=36; of which 30 from youth probation and six with voluntary help).
2. Evaluation of digital surveys that supervisors took after e-guidance (N=20).
3. Supplementary interviews with seven youngsters.
4. Supplementary interviews with nine supervisors.
5. A group evaluation with employees of Juvenile Probation Service in which the concept results were discussed.

E-guidance commenced in the final phase of supervision, so that youngsters had already had an opportunity to learn. During a period of three months they received customised messages to their phone. Before starting, participants received a digital survey; messages were composed and sent based on their answers, at different frequencies with regards to time and day. After the guidance, youngsters received an evaluation survey in which they were asked about their experiences and opinions. Their supervisors also filled in a survey after the guidance. Moreover, a group discussion was held with the management and supervisors of the Juvenile Probation Service.

Contrary to the expectations of supervisors, almost all participating youngsters had access to a smartphone and access to the Internet. Half of participants had an Internet plan and the rest used Wifi at home, at school or in public places. The youngsters responded to the questions well, only 15% had to be reminded to do so. Youngsters did change their phone numbers often, but only 10% was unreachable for an extended period of time. A relatively low number considering the target group. Moreover, not a single youngster indicated that he no longer wished to receive messages during the pilot.

The pilot has shown that it is technically feasible to develop a functioning test system. The composition of the messages required close attention, not only because of the limited amount of characters in a text message but also because it was necessary to find the right tone (not too patronizing or too childish) to motivate the youngsters. Considering the received (spontaneous) reactions from the youngsters to the messages from Sarah, we think we succeeded in doing so:

- "Maann, that ones really good!! Thank you!:)"
- "What a shame that I will receive your last message next week. [name youngster]"
- "You are right about that"
- "Yes I have been thinking but I don't know any students that I can shadow for courses but I am going to open days at schools"
- "I didn't know that, but of course I want to be successful so I could use some help"
- "My plan is to get rid of my debts and then make a new start in life."

The results from the evaluation surveys show that the opinions of the youngsters are very varied, both with regards to the content of messages as well as the frequency, tone and period. The youngsters did not have a problem with the fact that the messages were sent by a computer ("if someone says it to me or if I read it on my phone, that doesn't make any difference"). The overwhelming majority of youngsters thinks that the messages are positive and not difficult. 36% of youngsters thought the amount of messages they received was exactly right, a small group wanted to receive more messages from Sarah (11%) and half would have preferred fewer messages (50%).

64% of youngsters think a period of two months is exactly right, 14% wanted to receive messages for a longer period and 22% for a shorter period.

Approximately 22% to 40% (this differs per section) of youngsters say that the messages helped (somewhat to very much). This help is experienced primarily in working towards the learning goal, in gaining perspective of what is going well in their life, in approaching their problems, in doing the assignments, in asking for help and in beating procrastination. The most chosen learning goals were school (37%) and work (22%). Other learning goals, that were chosen more than once, included: more leisure time / sport (11%), asking help in difficult times (7%) and being responsible with money (4%).

Although more than half of participants think they don't need e-guidance themselves, they do think it is suitable for *other* boys: 80% of youngsters think that others will benefit from e-guidance. There is a clear discrepancy between what youngsters think is meaningful for them and what is meaningful for others. 81% of youngsters believe it can be a meaningful method for girls.

Employees signal that they are not surprised by the differences between subgroups: interventions are not 'one size fits all' and always work better or worse for specific subgroups. As noted, this research was not yet aimed at measuring effects. The first impression is that youngsters who indicated that they were somewhat chaotic and tense experienced the messages as helpful. However, this only applies to a very small group: a quarter of the youngsters (N=11) thought they were chaotic at the beginning of e-guidance; about half (N=21) thought they were tense. Future research can shed light on which type of boys (and other target groups) can experience extra behavioural change through e-guidance.

Supervisors are generally positive about the benefits and potential effects of e-guidance for youngsters. Moreover, they think it is an advantage that e-guidance aligns with the everyday lives of the youngsters. They feel that their organisation needs to do so as well and think that e-guidance should definitely be implemented structurally. They also signal that even if some youngsters say they don't think the method is helpful, it may still have a positive influence on their behaviour.

Prior to the guidance, a number of supervisors felt that the messages would not help because personal contact would be necessary. However, this study shows that youngsters do not think this is a problem and are indeed motivated by the messages. Even though a computer sends the messages, youngsters realise that people compose them. As mentioned earlier, it has also been shown in other fields that computerised messages can be as effective as face-to-face contact, for example in the case of cognitive behaviour therapy via the internet and in the treatment of depression, panic disorders, post traumatic stress disorders and burnout (Ruwaard et al., 2012; Ruwaard, 2012). In some cases people even find therapy via the Internet to be more pleasant than face-to-face contact because they feel comfortable being vulnerable, making the contact feel more personal. Furthermore, clients and therapists can think calmly before they react to each other and can decide at which moment to do so. Moreover, the client's resistance can fade because the therapist is not visible, and it is not clear what age, sex or appearance he or she has.

Many supervisors signalled that they would like to send messages themselves. Indeed, it would be ideal if supervisors composed all messages themselves. However, supervisors have a limited amount of hours per client and generally do not work outside office hours. Because e-guidance is systemised and automated, the messages can be sent early or late in the day, over the weekend, during holidays etc. Moreover, the guidance goes beyond the sending of memories or encouragement, and includes more pedagogical methods, such as assignments and feedback, that are aimed at behavioural change and in which scientific psychological knowledge has been carefully integrated. There are also extra possibilities such as video and interaction, and the costs are very limited.

We were occasionally asked whether or not this kind of app was already available. This is not the case. Interesting apps have been created, but these are thus far aimed at the work of supervisors (for example making a plan, sending memories, looking at the client's social media channels such as Facebook- or Twitter messages). There are also apps in which youngsters (or adult offenders) can fill in forms or visualise a social map. However, up until now, there has been no form of well-researched e-guidance developed that is aimed completely at the offender, is customisable and deals not just with practical matters, but is genuinely aimed at achieving goals and learning new behaviour.

It is clear that e-guidance must be implemented into the regular work processes, to a much greater extent than was possible during the pilot phase. Limiting factors during the implementation of the e-

guidance were a reorganisation and some resistance from supervisors: some had ideas about e-guidance that were not always consistent with reality but did lead to less enthusiasm (for example, that youngsters would feel the supervision was computer-like or that it would replace the work of supervisors). A dilemma is that employees signal that they want more control over the guidance but also signal that they don't have much time in which to do so.

The staff and a majority of the employees advise continuing the development of this e-guidance for use in the field of juvenile probation. They indicated that e-guidance can influence behavioural change and can be beneficial because it is consistent with the everyday lives of youngsters, a direction in which probation supervision must also head. "It is the world of the youngsters. We *must* move in this direction."

## 6. Discussion

The pilot has shown that e-guidance is technically feasible and implementable. It was possible to develop a functioning test system and to apply it to a category of youngsters who are notoriously hard to reach for social services. Although it was not easy, it was possible to base the content of the messages on psychological knowledge and to fit the tone of the messages to the youngsters. The youngsters have access to mobile phones and Internet and reacted often enough to get a first insight into the functioning of e-guidance. Although the scope of the test is small we can conclude that e-guidance is possible and achievable with this target group.

Whether the messages contribute to behavioural change must be seen in future research. On the basis of this pilot, we suspect that this will be the case with a portion of youngsters. Completely in line with our expectations, the e-guidance will not work for everyone, just as with other interventions. Regardless, some youngsters will benefit from it, and that at a low cost. Supervisors also signal this: even with boys that say they are not benefited by anything (even school or supervision) seeds are planted, that, for some, may start to grow at a later point in time. The youngsters themselves recommend the system for use with others.

In the further development of e-guidance it is essential to consider implementation within the work processes of supervisors. In practice, the implementation of eHealth creates high expectations, but also brings change. This pilot suggests supervisors are generally positive about using such a system because they see what the effects can be and because it aligns with the everyday lives of the youngsters. It is important to give the supervisors more clarity about what exactly is expected of them in terms of work and time. It is also desirable to give them more control over when the coaching is started and the content of the messages and to give them feedback about how the messages are received. It is not desirable that the supervisors get insight into the answers given by the youngsters, because for the youngsters 'Sarah' must remain a neutral and positive 'person.'

Future research might consider using e-guidance with other target groups: girls, youngsters with a lower IQ, in cases of absenteeism, with parents, but also with adult offenders, people that receive voluntary help and with supervisors themselves. The system can be used with all these subgroups when the text messages are adjusted to the target group and situation. The pilot has given concrete insight into a number of possible improvements.

All in all, e-guidance seems to be an applicable method that can be a good supplement to existing (justicial) social work. There is also international interest in the system. It can be an innovative enhancement of supervision for a large variety of clients, not only for Juvenile Probation Services, but also for organisations such as the Child Care and Protection Board, HALT, adult Probation Services, the prison system, addiction care and councils. Benefits are that it does not require much extra time from supervisors and that costs are limited. And, as noted by supervisors: e-guidance aligns with the everyday lives of clients. As with many other methods, it will not work for everyone in the target group, but it will for subgroups. The trick will be to determine which type of person is benefitted more or less by e-guidance: 'what works for whom, how and under what circumstances.'

A problem with innovation is that the benefits are not immediately evident, change is not always enjoyed and organisations tend to stick with familiar methods (for too long). This means that innovation often occurs much later than would be possible. Although e-guidance may not immediately solve a problem in the short term, it could contribute to the continuity and effectiveness of supervision in the long term. This is already the case in healthcare. Considering the low costs of

the system and the innovation goals of the government it seems worth testing e-guidance, with some adjustments, on a larger scale in the judicial system.

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WHICH INTERVENTIONS REALLY HAVE AN IMPACT ON HUMAN BEHAVIOUR

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