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COMPASSION-FOCUSED THERAPY WITH VIRTUAL REALITY FOR CALLOUS-UNEMOTIONAL YOUTH: A CLINICAL CASE STUDY ON THE THERAPY PROCESS OF A YOUNG OFFENDER

ABSTRACT

The antisocial and aggressive behaviour in childhood and adolescence combined with psychopathic traits has been connected to a more severe and chronic trajectory of antisocial behaviour including criminality. Latest research has shown that compassion-focused therapy (CFT) adapted to young offenders with psychopathic traits is an effective treatment. Also, virtual reality (VR) is a new promising treatment tool in forensic settings. In our CFT+VR study project, we combined CFT with VR in treating adolescents with severe antisocial behaviour and psychopathy. The aim of this case study was to deepen our understanding of the therapy process of one adolescent in the CFT+VR intervention and to test its efficacy on his psychopathic traits. The participant was a 19-year-old boy with a background of antisocial behaviour, detained in a closed prison in Finland. He filled out the Youth Psychopathic Traits Inventory Short Version at three measurement points: pre-treatment (T0), after the 10th CFT meeting (T1), after the last meeting (T2). Estimated with the Reliable Change Index (RCI), our results indicate that during the intervention his callous and unemotional traits decreased (RCI<-1.96) between T0 and T1 (RCI=-3.53), and between T0 and T2 (RCI=-2.83), as did his total psychopathic traits between T0 and T1 (RCI=-2.42), and T0 and T2 (RCI=-3.03). Based on the therapy progression and the Interpretative Phenomenological Analysis interview, the CFT+VR intervention increased the participant's awareness of emotions and their connection to his feelings and automatic aggressive reactions which the VR exposure enhanced further. Even though some criticism also arose, the results of this case study suggest that the CFT+VR may be a new promising tool in treating adolescents with antisocial behaviour and psychopathic traits.

KEYWORDS: PSYCHOPATHIC TRAITS, ANTISOCIAL BEHAVIOUR, JUVENILE DELINQUENCY, MORAL REASONING, COMPASSION-FOCUSED THERAPY (CFT), VIRTUAL REALITY (VR), CLINICAL CASE STUDY

INTRODUCTION

PSYCHOPATHIC TRAITS AND ANTISOCIAL BEHAVIOUR

In his book (1941), Cleckley established our modern conceptualization of psychopathy as a severe personality disorder (1). Psychopathic traits, such as superficial charm, low levels of guilt and reckless behaviour, were long seen as inborn characteristics, to have a solid neurobiological basis and therefore persistent and untreatable (2,3). Later research has challenged this view by claiming that the risk factors also include social and other environmental factors (4). Thus, psychopathic traits could be seen as an interpersonal, affective and behavioural adaptation to, for example, hostile rearing environments (4,5). The clinical presentation of a psychopathic individual is built upon three core traits: interpersonal (grandiosity and manipulativeness; GM), affective (callousness and unemotionality; CU) and behavioural (impulsivity and irresponsibility; II) (6).

Neither ICD-10 (7), ICD-11 (8) nor the DSM-5 (9) specifies a distinct diagnostic category for psychopathy. However, in ICD-11 and DSM-5, the diagnosis of childhood/adolescent conduct disorder may be used with a clinical specifier "with limited prosocial emotions", which includes many of the above-mentioned psychopathic traits. In the course of their life, children and adolescents with psychopathic traits are at heightened risk for engaging in severe and persistent antisocial behaviour, including criminality (10,11).

COGNITIVE BEHAVIOURAL INTERVENTIONS, COMPASSION-FOCUSED THERAPY AND PSYCHOPATHY.COMP

In cognitive behavioural therapy (CBT), dysfunctional thinking processes are treated using several methods such as teaching problem-solving skills and moral reasoning. Furthermore, developing capacities for identifying and regulating emotions and dysfunctional behaviour during therapy, and enhancing emotion and behaviour control is of key importance (12). In the context of serious antisocial behaviour and in the presence of callous and unemotional traits, inborn and developmental biopsychological processes and inherent weakness of capacity for social learning may lead to a lack of efficacy for psychotherapeutic interventions (13). Among adolescents with serious antisocial behaviour and criminality, the need for individually tailored interventions is emphasized (14).

Compassion-focused therapy (CFT) is a CBT-based therapy orientation that emphasizes compassion as a basic motivation in individuals, and it has been applied in the treatment of many different mental health problems (15). CFT has been shown to reduce overall negative mental health outcomes, depression, self-criticism, and to improve self-compassion and compassion toward others (16). The PSYCHOPATHY.COMP is a CFT-based intervention programme that was developed in the University of Coimbra, Portugal for the treatment of youths with antisocial behaviour and psychopathic traits placed in correctional institutes (17). So far, the efficiency of the intervention has been studied in only one research project by the developers of the intervention. The results of a clinical trial with 119 Portuguese detained boys, where 58 were in the intervention group and 61 in the control group, showed that the PSYCHOPATHY.COMP reduced self-assessed psychopathic traits, shame and fears of compassion (18–20). Further, the intervention increased participants' social safeness, self-compassion and compassion towards others compared to the control group. Increases in self-compassion and decreases in fears of receiving compassion were related to decreases in psychopathic traits. In the control group receiving treatment as usual, levels of psychopathic traits maintained or increased over time. Their condition maintained or declined also regarding shame, fears of compassion, social safeness and compassion toward the self and others. In a 6-month follow-up, the results were maintained or continued to improve in the intervention group and maintained or declined in the control group (20). In 2024 the US Department of Justice National Institute of Justice (NIJ) and Office of Juvenile Justice and Delinquency Prevention (OJJDP) rated PSYCHOPATHY.COMP as a promising evidence-based intervention (21).

TECHNOLOGY-ASSISTED INTERVENTIONS AND VIRTUAL REALITY

In addition to traditional therapy interventions, technology-assisted interventions, utilizing e.g. different software, psychophysiological meters and virtual reality (VR), are a rising trend in the treatment of mental health problems such as different phobias, panic disorder, PTSD and depression (22). So far, there is only little evidence of treating serious antisocial behaviour with these interventions, but research on this topic is increasing (23,24).

The advantage of VR is that it makes it possible to simulate threatening situations and to expose individuals to them in a physically safe environment. Thus, emotion regulation skills can be practiced gradually, taking individual needs into account. There is some initial evidence that VR might also increase the treatment motivation of forensic patients, which is often low (25). Because many of the VR treatment programmes have utilized game development, which is expensive, and the use requires special training (22,24), new cost-friendly and easily implemented VR interventions are needed.

In sum, adolescents with antisocial behaviour and psychopathic traits are a group that is especially hard to motivate and engage in treatment. Due to the severity of their symptoms, possible later criminality, and persistence of their trajectories, timely, motivating and effective interventions are needed. Although the PSYCHOPATHY.COMP has in one study been shown to be effective in the treatment of detained youths with psychopathic traits, the results are still limited to the Portuguese context. Further, no study has tested whether VR technology could augment the efficacy

of the PSYCHOPATHY.COMP in reducing psychopathic traits and enhancing the compassion of these at-risk youths.

AIMS

This is the first study project to test the efficacy of the PSYCHOPATHY.COMP programme outside the initial research project in Portugal. In addition to the original intervention, the Finnish version includes VR exposure, and therefore the programme is named CFT+VR. To test the efficacy and applicability of the intervention in the Finnish context, this clinical case study of a Finnish young offender aimed to answer the following questions:

1. What is the adolescent´s experience of the CFT+VR intervention combining the PSYCHOPATHY.COMP and VR?
2. How did the CFT+VR intervention combining the PSYCHOPATHY.COMP and VR affect the psychopathic traits of this adolescent?

SUBJECT AND METHODS

THE PARTICIPANT

John (pseudonym) is a 19-year-old boy who was sentenced for an aggravated narcotics offence and was detained in a closed prison in Finland. In the middle of this intervention, he was released from prison after appealing against his imprisonment. This was his second prison sentence. His earlier sentence was of aggravated deprivation of liberty, for which he received a few months of suspended imprisonment.

The psychiatrist interviewed John using both SCID-I and SCID-II manuals (26,27). Based on the psychiatrist´s interview and evaluation, he received ICD-10 (28) diagnoses of F62.2 (dissocial personality disorder), thus meeting the inclusion criteria for the intervention, and F19.1 (mental and behavioural disorder due to multiple drug use and the use of other psychoactive substances, harmful use). During his imprisonment, John did not receive any other psychosocial rehabilitation or psychotherapy in addition to this intervention. However, he independently rehearsed and attended the matriculation exam during the first half of the intervention.

PERSONAL HISTORY OF THE PARTICIPANT

A personal history was obtained via an interview with John. Although his life path seems normative in many parts, the joint effect of his fearless temperament, his father´s influence, the absence of restrictions and peers with criminal interests seem to have affected his moral socialization a lot. When talking about his history of violent behaviour and criminal acts, John did not show any affect or remorse.

John was born to term with no complications. John is the only child. His parents divorced in his early years and John lived with his mother. They moved many times within the same region which made his life scattered. John´s father was in prison for most of John´s life, and John seems to have idealized and internalized his way of life and thinking already in childhood. A few years ago, his father was released and has been a close part of his life since then. John´s grandparents from his father´s side have been in close contact with the family, supporting them throughout his life. In his childhood, John´s mother had many concurrent jobs, and he had a feeling that they were constantly out of money.

Academically, John had always done well in school and doesn´t have any learning difficulties. He had never been bullied, had always been social and had many friends. In primary school (the ages from seven to twelve), his grades were from eight to nine on a scale from four to 10. In lower secondary school (the ages from 13 to 15) John skipped classes a lot due to motivational deficiency. In his third year, he improved his attendance, and when leaving the lower secondary school, his average grade was about eight. Before imprisonment, John was in upper secondary school. He wasn´t motivated to attend classes and therefore he dropped out of the courses.

Since childhood, John started doing sports and has trained actively until his imprisonment. In lower secondary school, John started to hang around on the streets with other adolescents and came home late. John said his mother didn´t set him boundaries and if she had problems with John, she called John´s father who told him to behave. John estimates that due to the lack of boundaries, he drifted slowly into the wrong social circles and further to criminal life. John tried alcohol for the first time when he was 13-years-old. He drank a lot for a year and got bored with drinking after that. He tried some drugs at the end of the lower secondary school but says that mostly he used some pain medicine after hard training.

John says that in lower secondary school he started to have fights with other adolescents and encountered therefore preventive police and social workers. There were some child welfare notifications, but because everything was fine at home, there were no other consequences. In addition to

fighting, John sold snuff tobacco, which he thinks was the beginning of his criminal path. He feels that there was no pressure for criminality, and his father told him to stay away from harm. John feels that his temperament has also affected his life path a lot. He says that in scary situations, he has the urge to go against his fears and not admit them or to be like the others who have turned away from danger.

According to John, he has had several potentially traumatic incidents in his life; the sudden death of a close person and a specific frightening verbal fight between his mother and her partner. In general, he feels that both his mother and father have been safe persons for him despite his father´s criminal career. During his life, John has witnessed also a lot of physical violence and threatening situations but claims that it is a consequence of his own choices, and doesn´t consider that therefore traumatic.

As his strengths, John mentions sociality and adaptability. He says he has always had clear goals and rhythm regarding things that interest him. He also considers himself very resilient and feels that in prison he managed well, not being anxious or losing his mind. The main things that supported his managing during imprisonment were physical training and maintaining connections to his parents and friends. In the future, John would like to study at the university. In general, he hopes that he will be able to do what he likes and to live his life without excess stress.

CFT+VR INTERVENTION

At the core of CFT is a basic human motivation for compassion which includes three different forms: directing compassion toward oneself, showing compassion to others and receiving compassion from others (29). A person may have fears, blocks (lack of skills or understanding) or resistance towards showing or receiving compassion, which may cause and maintain mental health problems and problems in life in general. According to CFT, individuals have three emotion regulation systems: threat system (oriented to protection and safety), soothing system (oriented to affiliative safeness, contentment and soothing) and drive system (oriented to achieving and seeking out desired things) (30). These three systems should be in balance with each other, and promoting compassion is seen as a key instrument in gaining this balance (31).

In the PSYCHOPATHY.COMP programme within the CFT theoretical model, antisocial behaviour and psychopathic traits are seen as evolutionary-rooted responses to deal with harsh rearing environments (32). In the PSYCHOPATHY.COMP, it is assumed that due to traumatic background, adolescents with antisocial behaviour problems and psychopathic traits have an overactive threat system, an unbalanced drive system (mostly focused on short-term goals and wants) and an underactive soothing system (32). The aim of the programme is to offer psychoeducation of the emotions, bodily feelings and their connection to automatic reactions, to promote compassion towards oneself and others, and to understand possible fears, blockages and resistance towards compassion (18). The programme is manualized and consists of four modules with altogether 20 sessions. Each session lasts 60 minutes (*Table 1*).

Table 1. A brief overview of the PSYCHOPATHY.COMP programme

Module	Session	Theme	Key messages of the session
1. The basics of our mind	1	Presentations	We have a lot of things in common with each other. Most of the things in our lives are not our choice.
	2	Our basic ingredients	We all have the same instinctive reactions to threats.
2. Our mind according to CFT	3	Old brain/new brain = tricky brain	Humans have a tricky mind.
	4	Multiple versions	We are just one version of ourselves.
	5	Responsibility and freedom	We are not prisoners of our evolutionary, genetic, and environmental past experiences.
	6	Emotion regulation systems	It is important to be aware that we all have three emotion regulation systems.
	7	Emotion regulation systems (cont.)	A good way to achieve stability is to balance the functioning of our emotion regulation systems.
	8	Outputs of the threat system	We are all sensitive to shame.
	9	Coping strategies	What is the best strategy to deal with shame?
	10	Motivations and recovery	Knowing our motivations helps us to follow a path of recovery.
3. Compassionate mind training	11	Compassion: what is and what is not	No matter what, we can always choose compassion.
	12	Multiple selves	We all encompass a multiplicity of selves, and differentiating and integrating that multiplicity is the key.
	13	Fears of compassion	We all have fears, blocks, and resistances of compassion that we should face and overcome.
	14	Flows of compassion	All the flows of compassion are important, though they may encounter roadblocks.
	15	Self-compassion	Self-compassion is key and the only tool we have available 24/7.
	16	Flows of Compassion revised	Compassion always gives us an outlet.
	17	Safe place	We can go to our safe place and reach our compassionate selves whenever we need it.
	18	Compassionate letter	Compassion is powerful and can impact our lives.
4. Recovery, relapse prevention	19	Revisiting motivation and recovery: the role of compassion	We now have the tools to be responsible for our choices.
	20	What has changed? An overview	Life is always going to be bittersweet, learning to bear and face difficult moments compassionately is the key.

Abbreviation: CFT=Compassion-Focused Therapy

The CFT+VR is an intervention that combines the PSYCHOPATHY.COMP programme with VR exposure therapy. It includes all 20 CFT sessions from the PSYCHOPATHY.COMP combined with five VR sessions, which are placed evenly between the CFT sessions (*Table 2*). The VR sessions follow the same structure as the CFT sessions, and each VR session theme is based on the previous CFT sessions. Each VR session includes three parts: an exposure video, a soothing video and an optional video game or VR video. First, the therapist and the adolescent recapitulate the themes of the previous CFT session. Then the therapist gives the adolescent directions based on the session theme, and the adolescent watches an exposure video, which demonstrates a threatening situation including social shame to activate his threat system. After the video, the therapist asks questions about the thoughts, feelings and bodily reactions the video evoked in the adolescent. After the discussion, the adolescent watches a soothing video, which includes peaceful natural scenery, and during the video the adolescent does a CFT breathing exercise to calm down and activate his soothing system. After the soothing video, the therapist discusses with the adolescent his thoughts, feelings and bodily reactions, and the difference between the activation of the threat system and the soothing system. After the videos, the adolescent can choose between playing video games or watching more VR videos to demonstrate the activation of the drive system.

All the VR videos were filmed with a 360-degree VR camera by a member of the research group. He also scripted the videos with the members of the Finnish prison theatre Porttiteatteri, the local amateur theatre and the staff of the Finnish reform schools, who raised social shame as a main theme for the exposure videos. The exposure videos, which were 3-5 minute short films, were acted by the members of the Porttiteatteri and local amateur theatre. Soothing videos were 5-7 minute still videos filmed on the beach, in the forest and by the brook, and one video was filmed while skiing slowly on the ice. The other optional videos, which the adolescent could watch at the end of the session included, e.g. hiking, kayaking and cycling. The members of the research group selected the games that the adolescents could choose from the game menu of the VR headset, and the games with violence or with the possibility to connect with other players were excluded from the options. The VR headsets utilized during the therapy were Meta Quest2 with 256GB of internal memory.

Therapy sessions

This clinical case study is the first outcome study of a wider research project, which aims to test the efficacy of the CFT+VR programme among Finnish detained youth.

The therapist is a clinical psychologist with three years of clinical experience in treating adolescents with diverse mental disorders and conducting psychological evaluations

Table 2. Location of the VR sessions in the PSYCHOPATHY.COMP programme

Module	Session	Theme	Key messages of the session
1. The basics of our mind	1	Before the 1st session	Introducing the programme and the VR equipment, motivating
	2	After the 2nd session	Exploring the connection between emotions, thoughts and behaviour
2. Our mind according to CFT	3	After the 8th session	Recognizing shame and automatic reactions to it
3. Compassionate mind training	4	After the 12th session	Recognizing anger, fear, anxiousness, and sadness in a threatening situation
	5	After the 16th session	Giving compassion to others, receiving compassion from others, and self-compassion in a challenging situation

Abbreviations: VR=virtual reality, CFT=Compassion-Focused Therapy

in special healthcare and as a school psychologist. She had earlier training and experience with disorder-specific CBT-based short interventions, including CFT. She received advanced training on CFT and on the CFT+VR and had supervision sessions twice a month.

Therapy sessions were held in the prison classroom. The special instructor of the prison got John from his ward to the meetings and back. In some sessions, there was also a guard escorting him. During the sessions John and the therapist were alone, but there was ongoing camera surveillance in the classroom.

In the middle of the intervention, John appealed against his imprisonment, and he was released after a month of his appeal, after the CFT session 12. He wanted to continue the intervention after he was released, and the rest of the sessions were held in the local library meeting room.

MEASURES AND ANALYSIS

Youth Psychopathic Traits Inventory Short Version

Youth Psychopathic Traits Inventory Short Version (YPI-S) is an 18-item self-assessment questionnaire for screening of psychopathic traits (33). It has been developed from the original YPI questionnaire (34), which was translated into Finnish and whose psychometric properties proved to be good (35). YPI-S covers three factors: grandiose and manipulative traits (GM; dishonest charm, grandiosity, lying and manipulation), callous and unemotional traits (CU; callousness, unemotionality and remorselessness) and impulsive and irresponsible traits (II; impulsiveness, thrill-seeking and irresponsibility) (33). Its questions are on the 4-point Likert scale where 1 = "Doesn´t apply at all" and 4 = "Applies very well". Thus, the total score of the scale ranges from 18 to 72, and the measurement has no official cut-off score for psychopathy.

John filled out the YPI-S questionnaire at three different points: pre-treatment (T0), after the 10th CFT meeting (T1), after the last meeting (T2). John´s YPI-S scores were compared to the scores of other participants, who had completed the intervention in this study programme (n=9).

Reliable Change Index

The results of the YPI-S questionnaires were analysed using Reliable Change Index (RCI) (36). RCI is used to estimate the reliability of the change in therapy by calculating the ratio between the observed change between measurement points with the standard error of the measurement in the general population.

$$RCI = \frac{x_2 - x_1}{SE_M} = \frac{x_2 - x_1}{\sqrt{2(SD_0\sqrt{1 - r_{xx}})}}$$

Where: x1 = score 1, x2 = score 2, SEM = the standard error of measurement of the difference, SD0 = standard deviation of the general population, and rxx = the reliability of the measure; Cronbach´s alpha.

The change is considered reliable if the individual change score is greater than a difference that could have occurred due to random measurement error alone. As the RCI score follows normal distribution, RCI over 1.96 or under -1.96 is considered statistically significant ($p<.05$).

The RCIs for changes in YPI-S were calculated between T0 and T1 and T0 and T2. Since the Finnish validation study for YPI-S is still in progress, the standard deviation of the general population and Cronbach´s alpha for this study were obtained from the validation study of the German version of YPI-S in the Swiss German-speaking normal population (37). Their participants were estimated to be culturally closest to the Finnish normal population adolescents of the current validation studies and their reported values available.

Interpretative phenomenological analysis (IPA)

Interpretative phenomenological analysis (IPA) is a qualitative analysis method that originated in psychology (38). IPA is based on phenomenology and therefore it aims to examine how people make sense of their life experiences and explore those experiences in their own terms. The researcher interprets these experiences using their expertise. The process in IPA is idiographic, proceeding from details and single cases to comparisons between cases and a more general view. IPA is an adaptable method and there is no predefined interview structure. In IPA, semi-structured interviews are tailored individually to each study based on the research questions of the study.

In this study, the main structure of the questions was planned using the instructions in the IPA guide (38). Based on the research questions the main questions were as follows:

1. Do you feel that you got some advantage from the intervention? What was it? What was the most important thing for you in the intervention?
2. Was there something disadvantageous or negative for you in the intervention? Was there something that could have been better so that you could have got more advantage from the intervention? What was it?
3. How did you feel about the VR exposure?
4. Is there something else that comes into your mind, or you would like to add?

In addition to these questions, there were clarifying questions during the interview.

The therapist interviewed John, and the interview was recorded. After that, the interview was transcribed. Using the recording and transcription, the therapist and another psychologist from the research group, who is also trained to deliver CFT+VR intervention, listened and analysed the interview based on the IPA protocol. First, independently of each other, based on the research questions and their impression, the therapist and the other psychologist extracted the main themes and sub-themes from the interview. In addition, based on their expertise, they wrote up their interpretations of John´s experience. Second, the therapist and the other psychologist compared and discussed their findings to reach a consensus on the themes, sub-themes and the interpretations of John´s experience. Third, the final results were written including the extracted main themes and sub-themes, and under them the most relevant citations from John with their interpretations.

ETHICS

The study plan was evaluated by the Ethics Committee of Helsinki University Hospital (HUS). Permission to conduct the study was granted by the administration of HUS, Finnish Institute for Health and Welfare and Prison and Probation Service of Finland. Written informed consent was obtained from the participants after receiving oral and written information about the study. In this case study the participant is referred to as the pseudonym "John" to preserve his anonymity. After the therapy, he reviewed the written personal history and the clinical description of the therapy before publication of the article. The therapist sent the materials to him before writing the rest of the manuscript. The participant accepted the descriptions of him and the therapy progress with minor clarifications.

RESULTS

COURSE OF TREATMENT AND ASSESSMENT OF PROGRESS

We present John´s treatment progress evaluated by the therapist through the four PSYCHOPATHY.COMP modules including the VR sessions.

Module 1 (sessions 1 and 2)

During the first sessions, John was very cooperative and polite. He told the therapist that he did not have any issues with aggression, and therefore questioned the suitability of the programme for himself. In the therapeutic discussions, John appeared to be only outwardly open: he seemed to be reserved and withdrawn regarding his private thoughts. His answers to the therapist´s questions were short and avoidant.

When doing the first CFT exercises, John said that he had already been thinking a lot about who he was and why he was in prison. When discussing the goals for therapy, he said he wanted to understand himself better. He told the therapist that he had been doing some breathing exercises by himself and found them calming. When the therapist introduced the idea of the embodiment of emotions, John was very interested in it since he had never thought about it earlier. When the task was to consider different threatening scenarios and his actions, thoughts and emotions in them, he contemplated it a lot. Of his emotions, he was able to recognize aggression, fear and sadness, and also some bodily reactions related to them.

John seemed to enjoy playing with the VR glasses and used them easily. After the first VR exposure and breathing exercise regarding the threatening scenarios, John was able to recognize bodily reactions, thoughts and feelings, and the changes in them. He wondered that maybe he wasn´t as fearless as he had thought before. After the first VR session, he wasn´t interested in gaming anymore and said that he would rather talk more about the embodiment of emotions.

Module 2 (sessions 3-10)

In the second module, John seemed to be still a bit cautious but remained cooperative. At the beginning of every session, John said that he didn´t remember anything about the previous session but had been thinking about his life and who he is in general. He told about the injustice he had faced in the prison from the guards. John said also that he had noticed that the prison environment and the ideas of

the other prisoners had started to change his thinking to more criminal-like, and he stated that prison isn´t a good place for youngsters.

When the therapist introduced the three emotion regulation systems of the CFT, John seemed to understand their core ideas easily. He was also curious about the themes of each session and wanted to move from the general conversation to the tasks of the current session.

John noted many times that in his childhood he didn´t have a hostile rearing environment, which is one of the core themes that recur in the CFT materials. He discussed his childhood more deeply and started to think about the effect of his father´s criminal life on his own way of thinking and moral judgments. He also contemplated his life path deeply and his future plans relating to that. John said that he has tended to not respect and value people, and to benefit from them. Later he has started to appreciate more equal relationships.

When discussing aggression, and the threat system behind it, John was notably calm and restrained. John said that his behaviour is always controlled and considered. However, when talking about shame, John came to the idea that maybe the shame he had felt before in close relationships was affecting his actions more than he had thought before. He also realized that he had a very strict idea of getting even, to show his boundaries to other people. He stated that in prison, which has steady unaltered routines, it was hard to remember how he behaves in real-life situations.

John found self-compassion and receiving compassion hard for him because he was so demanding of himself, never feeling good enough, and he felt that it was his greatest challenge. He said he felt slightly uncomfortable with the self-compassion practices, even though he tried them.

As for his motives for life, John mentioned being good at sports, money and family. He stated that he wanted to be valued and respected. His tools to achieve his goals included practising and going to school.

John didn´t find the third VR exposure video threatening and stayed calm during the whole session. During the relaxation video, John stayed calm, watched the whole video, and found it nice and relaxing. After the videos, he didn´t want to play games with the glasses but rather to talk about his fears and motives in life.

Module 3 (sessions 11-18)

At the beginning of the third module, John seemed to be used to the session structure, was more open than in the beginning, and attended the sessions with curiosity. John appealed against his imprisonment and was released after the 12th session. He had told the therapist that regardless of his possible release, he would like to continue the programme in civilian life, so after a two-week break, they continued the sessions in the local library meeting room. In the sessions, John was more restrained at first but opened up again after a few sessions.

At the beginning of the 14th CFT session, John did the breathing exercises but stated that they were boring. He didn´t want to do them every time. When asked about the previous sessions, he didn´t remember anything about them. He stated that he hadn´t thought about them between the sessions because in civilian life he had all the time something to do.

The compassion exercises were still embarrassing for John, and he approached them quite superficially. He found receiving compassion especially hard. He told the therapist that receiving good feedback on his accomplishments was easier, even though he was still critical whether the feedback was truly earned. He felt that his value was based on his doings and accomplishments. Many of the discussions led to consideration of John´s earlier life and its effect on his thoughts and emotional life. These discussions he found useful even though the therapist challenged his thoughts sometimes quite straightforwardly. The mindfulness exercises John felt "strange and too religious". He had a hard time concentrating and immersing himself in them even though he did the exercises calmly.

In the VR sessions, John reacted to the threatening situations more than in prison. He found the situation filmed in a small unattractive café especially provocative, since he felt that in a similar real-life situation, he would have had no other option than to fight. He contemplated his reactions with thought. The soothing videos John found boring, and didn´t seem to concentrate on breathing. Also, he didn´t want to play any VR games, since he considered discussion more important.

Module 4 (sessions 19 and 20)

The last two CFT sessions concentrated on the revision of the main themes of the programme, John´s life path, and how they affected John´s thought patterns and his future. The discussion stayed mostly on the surface, but at some point, John contemplated his life also on a deeper level showing a clear understanding of his emotions and behaviours. John noted that during the programme he had noticed that when threatened he could snap in a split second and change to a different person. He wondered that he had always been like that, already in his childhood. However,

he felt that it was a state that was hard to generate without a real threat, and that´s why in some situations he had also felt fear. John didn´t seem to be worried about his future. The last meeting was warm and informal.

CHANGES IN SELF-ASSESSED PSYCHOPATHIC TRAITS

Measured with YPI-S, John´s self-reported total psychopathic traits, and the sub-dimension scores of YPI-S, weren´t at any measurement point very high - they stayed within all three measurement points (T0, T1, and T2) within the 2SDs of the population mean (*Figure 1*). Compared to the other adolescents who have completed this intervention in our research project so far (n=9), John´s YPI-S scores were below the median on all three measurement points (*Figure 1*).

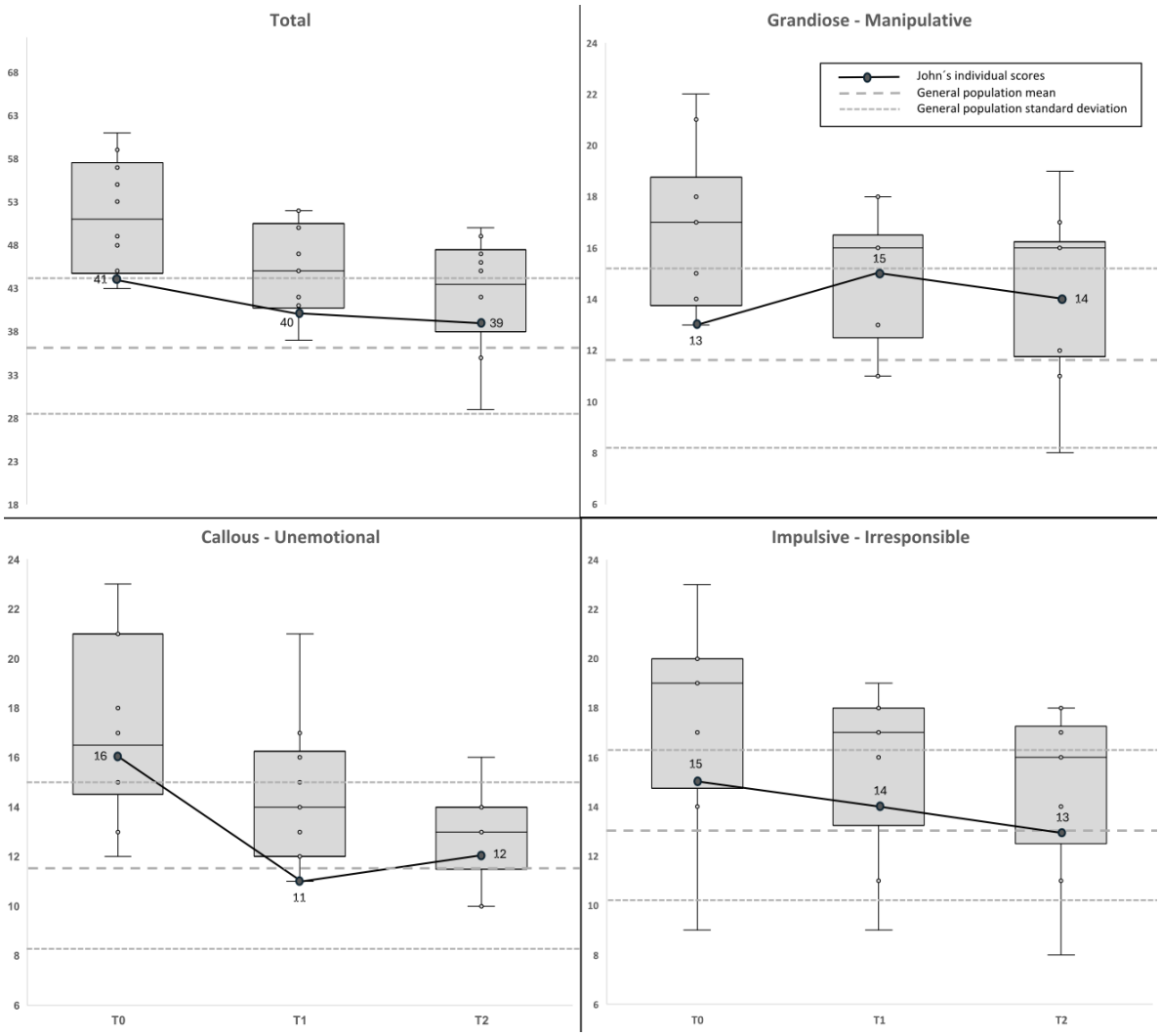
When the RCIs were calculated between the measurement points T0 and T1, and between T0 and T2, there were no reliable changes in the grandiose and manipulative traits or impulsive and irresponsible traits (*Table 3*). Within callous and unemotional traits and YPI-S total scores, the decrease in the scores was reliable between both T0 and T1 and T0 and T2.

Interpretative phenomenological analysis

John´s experience in the CFT+VR intervention

For the first research question regarding John´s experience in the CFT+VR intervention, the therapist and the other member of the research group extracted independently the four same main themes: therapeutic alliance, self-reflection and the level of change, exercises of the CFT, and VR. In addition, the therapist extracted a fifth main theme considering the difference between prison and civilian life which was discussed and added to the list. The main themes and their subordinate themes are listed in *Table 4*. A more detailed table with examples of each sub-theme is in *Appendix A*.

Figure 1. Changes in the YPI-S main scores and its sub-dimension scores between all three measurement points: John´s individual scores marked with solid line, box plots summarizing results of all the completed interventions (n=9) in the CFT+VR project so far, and the general population means and standard deviations from the Swiss validation study (37) marked with dashed lines



Abbreviations: YPI-S=Youth Psychopathic Traits Inventory Short Version, CFT+VR=Compassion-focused therapy with virtual reality for callous-unemotional youth, measurement points: pretreatment (T0), after the 10th CFT meeting (T1), after the last meeting (T2), CFT=Compassion-Focused Therapy

Table 3. Reliable Change Index for the changes in the YPI-S sub-dimension scores and total scores

Measure	RCI1	RCI2
YPI-S		
Grandiose - Manipulative	1.67	0.83
Callous - Unemotional	-3.53*	-2.83*
Impulsive - Irresponsible	-0.70	-1.41
Total score	-2.42*	-3.03*

Abbreviations: YPI-S=Youth Psychopathic Traits Inventory Short Version, RCI1=reliable change index between T0 and T1, RCI2=reliable change index between T0 and T2, measurement points: pre-treatment (T0), after the 10th CFT meeting (T1), after the last meeting (T2), CFT=Compassion-Focused Therapy, *=RCI < -1.96

Table 4. Main themes and subordinate themes extracted from the IPA interview regarding John´s experience in the CFT+VR intervention

Main theme	Subordinate themes
Therapeutic alliance	Discussion as the most important element
	Warm and trusting relationship with the therapist
	"We" talk
Self-reflection and the level of change	Evoking ideas
	Increasing self-knowledge even though still on the cognitive level
Exercises of the CFT	Doing the breathing exercises at every session felt needless
	Some of the exercises were good, the ones with compassion were discomforting
VR	The exposure videos affected even though they weren´t realistic
	No negative impact of VR
	The soothing videos felt uninteresting
	Games were fun
The difference between prison and civilian life	In prison life was deprived; therapy gave structure, someone to talk to, and evoked ideas and exploration
	In civilian life therapy gave still some structure, but there was no time for contemplation

Abbreviations: IPA=Interpretative Phenomenological Analysis, CFT+VR=Compassion-focused therapy with virtual reality for callous-unemotional youth, CFT=Compassion-Focused Therapy, VR=virtual reality

The therapeutic alliance

In the interview, John stated many times that the discussion with the therapist was the most meaningful part of the intervention for him:

> *"Overall, maybe the nicest thing was the possibility to discuss different matters, like as in addition to them [the exercises of the CFT]."*

The interview conveyed an impression that he appreciated the connection with the therapist also on a common human level, that there was someone to talk with and to share his thoughts:

> *"...but also that you are able to discuss, and to talk this and that too."*

John appeared to have a warm and trusting therapeutic relationship with the therapist since his voice was soft and warm during the interview, and he laughed softly many times showing a connection with the therapist. The therapeutic relationship appeared to provide him some value, even though he had many friends in civilian life to talk to:

> *"And of course, you are able to talk with people here [in civilian life] more, but still this has been quite fine."*

During the interview, he used a few times the phrase "quite fine" with an emphatic tone which both evaluators interpreted to express something very good and important to him. On many occasions he used the word "we", which could be interpreted as he had the feeling that he and the therapist were together in the process, inspecting and discussing his life:

> *"Those discoveries we made also today." "We have been doing quite nicely."*

Self-reflection and the level of change included two subordinate themes. When the therapist asked if John had found any advantages of the therapy sessions he answered:

> *"Well, yes. Like it [the sessions] has evoked ideas, definitely."*

The intervention appeared to increase his self-contemplation and exploration of his own thoughts, emotions and his life path in general:

> *"Well, exactly that… that you get something to think of, and that you think things in a more explorative way."*

However, the contemplation seemed to stay still on the cognitive level since John talked only about changes in his awareness and understanding, not on the level of emotions or behaviour:

> *"That you come maybe more aware of your own weaknesses and strengths", "like why certain situations evoke this kind of ideas".*

When John thought about the changes in his empathy, there seemed to be some possible changes also on the deeper levels when John had become more aware of his problems with empathy:

> *"I have opened up for example with empathy, and also with other subjects we have discussed (…) there must be some change in them (…) Well, I don´t say it [the empathy] has changed like.. but the awareness of it has grown. In that sense it has changed, because the awareness has grown and replaced it [the earlier state with empathy]."*

Even though the change didn´t reach deeper levels yet, John appeared to gain some important insight into the connection between emotions and bodily reactions:

> *"Yeah, that [the embodiment of emotions] was one of the good ones (…) that it was like.. I hadn´t thought about it earlier."*

Exercises of the CFT

When the therapist asked how John had felt the exercises of the CFT, his first answer was:

> *"Well those breathing things sucked (…) or for a few times they were quite good (…) like you understand that you can calm down with them. But usually when you wake up and come [to the meeting], you are too tired to breathe [in an instructed way], when you have already been breathing for the whole night."*

As John seemed to be already quite calm and strict with his self-control, he appeared to find the breathing exercises boring and useless. On the other hand, during the therapy he mentioned that he had a hard time being alone in silence and therefore breathing exercises might have evoked restlessness in him. After he had told what he thought about the breathing exercises, he continued about the CFT exercises:

> *"Otherwise they have been quite.. quite good. Of course, some of them have been a little discomforting (…) but mostly quite nice."*

This could be interpreted that he liked the exercises of the CFT and thought about them positively, even though he couldn´t name a single exercise. About the discomforting exercises he specified:

> *"I don´t remember what [exercises] have been discomforting, except those [related to compassion]."*

After addressing this he continued quickly to the importance of the therapeutic discussion in general, which could be a sign that the compassion was such a difficult topic for him that he avoided it even in the interview.

VR

When asked about VR, John swore for the first time during the interview indicating that even the thought of the VR videos aroused some emotion in him:

*"Well all of them were f*cking annoying."*

He felt that the videos really evoked emotions in him, even though they weren´t entirely realistic:

"They were like.. they were good. Or some of those videos. Like they were not necessarily always that realistic, but they evoked like some emotions."

In his answer he seemed to also understand the main idea of the VR exposure: to evoke emotions and reactions and to investigate them in the therapeutic setting:

"Like maybe it somehow helps to think about.. like how you react in those kinds of certain situations. Like you start to think of your emotions that.. and what you would probably do if that was like.. a real situation."

This indicated that VR helped to process things learned in the CFT in an even more bottom-up way. When the therapist asked about possible negative effects, John laughed and stated that:

"No. (…) They didn't come to dreams. (…) They weren´t that scary."

Also, the soothing videos evoked some emotions and swearing, and similar to breathing exercises, the soothing videos felt boring and dragged:

*"Sometimes they were ok, but usually it was like right.. like f*ck I wish this already ended."*

John also stated that the nature sceneries didn´t feel that realistic:

"..and maybe those kinds of videos of sceneries, they don´t feel that realistic. Like yes, I do enjoy nature and so, and I stop to look at a great view, absolutely, and to calm myself down. But it doesn´t.. it doesn´t convey through the glasses."

This answer could be interpreted that John had had earlier intensive experiences in nature which had also released stress in him. Compared to that, the VR videos didn´t feel the same. And as during the CFT breathing exercises, John had a hard time concentrating, staying still and breathing during the long and calm videos. When asked about the games in the VR sessions, John answered with a positive tone:

"They were quite fine. Well, games are fun."

The interview conveyed an impression that he enjoyed the games and felt them exciting and motivating, even though in the actual sessions, he skipped the possibilities to play to discuss the themes of the sessions further.

The difference between prison and civilian life

When the therapist asked John if the meetings were important for him and if they were, why, he answered:

"At least in the prison it was like.. it keeps up the rhythm there. But also, that you are able to discuss, and to talk this and that too. It is like (…) big, big part of that prison life."

Even though the meetings were only once or twice a week, they seemed to give him some structure, since most of his days he was in his ward sitting in his cell, talking with other prisoners or training. As he had felt the guards quite threatening and had many conflicts with them, it seemed to be important for him that there was someone who approached him positively and kindly, and had time to talk with him about the things that mattered to him. As he didn´t have anything else but time in prison, he also contemplated his life and the things learned during the intervention by himself:

"In the prison I had time to think and also like to test, or do some kind of contemplation."

Therefore, it can be suggested that deprived and structured time in prison supported his therapeutic progression. When asked about the meaning of the meetings in civilian life, John answered:

"Yes, these have been.. well, this same that it [the therapy meetings] keeps up that rhythm.. rhythm at least for some point. And, of course you are able to talk in a different way with people here [in civilian life]. But still, this [the meetings] has been quite fine."

In civilian life, John was able to meet his friends and family and to train regularly. Despite that, he found the therapy meetings and the connection with the therapist meaningful. Because John didn´t go to school or have a job after he was released, the meetings gave him some structure as there was something appointed in his schedule. It can also be that the meetings gave him a feeling of continuity in the middle of a new life phase, where everything else was yet open. Because of his active social life and tendency to avoid silent moments, he didn´t contemplate things between the meetings anymore:

"But now that life has been quite hectic at times, I haven´t stopped to consider things."

This change was apparent also during the meetings as the level of discussion stayed on a more surface level than in prison, and John avoided difficult topics more than earlier.

Changes in psychopathic traits

To answer the second research question regarding the change in psychopathic traits, the therapist and the other

member of the research project agreed that the three main themes observed should be based on the sub-dimensions of the YPI-S questionnaire. Since the subjective experience of the changes in psychopathic traits and their sub-dimensions wasn´t asked straight from John, they evaluated these traits from the tones and wording from the interview in general. The main themes and their subordinate themes extracted from the interview are listed in *Table 5*. A more detailed table with examples of each sub-theme is in *Appendix B*.

Table 5. Main themes and subordinate themes extracted from the IPA interview regarding changes in the psychopathic traits of John

Main theme	Subordinate themes
Callous-unemotional	Cognitive level: familiarity with compassion and emotions
	Discomfort with compassion
Impulsive-irresponsible	Life management, rhythm
	Behavioural control
	Restricted life in prison made contemplation possible
Grandiose-manipulative	Talking on general level and avoiding too personal level

Abbreviation: IPA=Interpretative Phenomenological Analysis

Callous and unemotional traits

As explained already relating to the first research question, John felt that his awareness of empathy had grown, and the state of it had therefore changed during the intervention. He had also become more aware of the embodiment of the emotions. Until the end of the intervention, he found compassion discomforting, especially receiving it, and he pointed to it many times also during the interview. This also showed awareness considering his deficits related to compassion. As the callous-unemotional traits are related especially to both cognitive and affective empathy deficits and reduced emotional responsiveness, even minor changes in the awareness of empathy and compassion and one´s internalized deficits with them might be meaningful in longer-term processes.

Impulsive and irresponsible traits

As mentioned above, John felt that the meetings gave him structure and rhythm both in prison and in civilian life. As he mentioned this by himself, he might have had an inner need for something to give internal structure to his life. Also, the restricted life in prison gave him structure, which he didn´t seem to have in his civilian life. The growth of awareness regarding empathy and compassion which he mentioned in the interview, might lead to more considered actions than before and therefore decrease impulsivity. The only mark of this possible behaviour change was when John in the last meetings wondered that maybe he should earn his money in the future with something that doesn't lead him to prison anymore. This showed that he had done some contemplation about his actions and their consequences for his life.

Grandiose and manipulative traits

Possible grandiosity and manipulation were the hardest ones to distinguish from the interview. The only subordinate theme found indicating some manipulation was talking on a general level avoiding a too personal level. During the interview both evaluators had the impression that John avoided many questions by answering them only on a general and ambiguous level:

> *"Well, in general, these things which we have talked about (…) there have been many things which we have talked about"; "Don´t they always say that discussion helps.. Or something like that."*

This was the case even though the therapist tried to define the questions to gain deeper-level answers, and even though John and the therapist seemed to have a warm and trusting therapeutic relationship as mentioned earlier. The reason for avoiding the more personal level might have been John´s fears of compassion or his strict idea of having his feelings and emotions under control.

DISCUSSION

In our Finnish CFT+VR study project, we combined PSYCHOPATHY.COMP and VR in treating adolescents with severe antisocial behaviour and psychopathy. The aim of this case study was to deepen our understanding of the therapy process of one adolescent in the CFT+VR intervention and to test its efficacy on his psychopathic traits.

MAIN FINDINGS

The therapy process deepened John´s understanding of emotions, bodily feelings and automatic reactions, and how they are connected. All of this is at the core of the PSYCHOPATHY.COMP programme (18). In prison, he contemplated these matters and his life a lot. After his release, his contemplation decreased but he was motivated to continue the therapy process to its end, indicating that he may have formed a strong therapeutic alliance with the therapist. In general, dropout rates among psychotherapies are estimated to vary between 20-50% (39), and among adolescents to be from 28% up to 75% (40). Strong alliance is one of the most important mediators of change in psychotherapy (39), and therefore the warm and trusting therapeutic relationship found in the IPA interview may have enhanced John´s adherence to therapy and the change in his awareness on many domains of the PSYCHOPATHY.COMP.

John found most of the CFT exercises useful, even though he resisted compassion and found some of the mindfulness exercises strange and even religious. John noted that his greatest challenge was being demanding and strict towards himself, never feeling good enough. There is some evidence that self-criticism may evoke fears of self-compassion and compassion received from others (41) which may, in turn, block the recovery of the basic motivation for compassion (42). Research has found that relatedness with other people is an essential part of affect regulation (43). Further, fear of self-compassion and receiving compassion from others is related to different mental health problems (42). Therefore, high self-reliance related to fears of compassion may isolate a person on an affective level from other people and therefore maintain mental health problems and individual suffering. On the other hand, John claimed that some of the exercises felt too religious, and he couldn´t relate to them even when he tried. CFT and many of its exercises are strongly based on the Buddhist meditation tradition (44), which may feel too spiritual and therefore unfamiliar in the Finnish context, forming at least a partial blockage for therapeutic change.

VR exposure seemed to increase John´s bottom-up processing by evoking emotional responses to threatening situations, even though he didn´t find all the videos realistic. This is in line with previous research, which indicates that VR exposure can work as a potential stressor as it induces the hypothalamic-pituitary-adrenal axis and autonomic nervous system activation (45). As there are already promising results of enhancing the effectiveness of traditional CBT with VR in the treatment of different anxiety disorders (46), John´s positive experience with VR may indicate that VR in addition to CFT may enhance its effectiveness correspondingly.

John´s self-evaluated psychopathic traits weren´t even at the base level over the average of his age group, but still, there was a decrease in his callous and unemotional traits and total psychopathic traits. The aim of the PSYCHOPATHY.COMP is to reduce adolescents' psychopathic traits by teaching compassion towards oneself and to others, and so change the adolescents´ life courses to be more compassionate and thus prosocial (17). Even though John´s self-evaluated psychopathic traits didn´t exceed the 2SDs of the compared normal population means, in addition to John´s serious offences and violence, he stated that time in prison had started to modify his thinking to even more antisocial. It is therefore possible that this intervention managed to change his trajectory with psychopathic traits, which without this

intervention could have worsened over time. Based on the interview, the decrease in callous and unemotional traits and psychopathic traits in general may be caused by the increase in his awareness of empathy, the embodiment of the emotions, and his challenges with compassion, and also the understanding of causes and consequences affecting his life path. These results are in line with the results of the PSYCHOPATHY.COMP programme which showed that the psychopathic traits of participants decreased during the intervention (18). In the same study, psychopathic traits of the controls maintained or even increased over time. As this case study evaluated John´s changes during the intervention and at the end of it, a follow-up study is needed to evaluate the permanency of the changes and their effect on his life path.

STRENGTHS AND WEAKNESSES OF THE STUDY

Acknowledging that we present a case study, the generalizability of these results is highly limited. However, as this therapy process was among the first CFT+VR interventions delivered in our study project, this study gives important insight into how feasible the CFT+VR is for a 19-year-old adolescent for the therapy process, and how the intervention may affect a young prisoner.

The change in psychopathic traits was evaluated with the YPI-S self-report and the IPA interview. As the original YPI has 50 items (34) and in our study project there are several self-report measures, it was assumed that adolescents with antisocial behaviour and impulsivity would not fill in the longer version and thus the shortened version was chosen. In earlier studies on the psychometric properties of the YPI-S, it has been found to be a reliable and valid screening instrument for psychopathic traits (e.g. 37,47,48). Further, YPI-S was used in the original Portuguese study (18). Therefore, it also offered a valid tool to compare the results.

As information gained during the therapy process and from the interview indicates, John has a history of severe antisocial behaviour including instrumental violence and the sentence of aggravated deprivation of liberty. Further, during the intervention and the interview he did not show any affect or remorse when talking about his criminal behaviour or instrumental violence he had used. At the end of the intervention, John stated that he had problems with immediate aggressive responses when threatened, difficulties obeying the rules and differing moral standards. He seemed to have two different selves: one that was loyal, warm and empathic towards family and friends, and the one that was cold, strict and forceful when encountering threats. Despite the earlier good results of the reliability and validity of the YPI-S, it didn´t capture his impulsive and irresponsible behaviour or callous and unemotional affect, or at least they didn´t differ remarkably from the Swiss general population mean. This raises the question of how well the YPI-S as a self-report measure differentiates the actual psychopathic traits among adolescents. The original YPI questionnaire was developed to tap psychopathic traits indirectly to avoid social desirability in answering (49). The higher scores on YPI-S have also been related to more frequent and serious offending. In the original study (49), the general population conduct problem adolescents high in psychopathic traits scored also higher on property offences, violent offences, serious violent offences, vandalism and delinquent versatility. Also, in the YPI-S validation studies in general and at-risk samples there has been a positive correlation between YPI-S measures and self-reported criminality (37,47,50,51), especially within the grandiose-manipulative sub-factor (50). On the other hand, it has been argued that criminality is only a correlate for psychopathy, not a definitive component of it (52). One reason for this inconsistency in John´s case might be that his emotionally safe relationship with his mother has taught him warmth and empathy in close relationships, and on the other hand, the need to be connected to his father has taught him to toughen himself if needed and moulded his moral reasoning to accept criminality as a tool to achieve goals, mirroring the adaptive nature of psychopathic traits (53). Research has shown that infants already have a tendency to be altruistic toward strangers (54), and responsive parenting enhances the development of conscience and empathy (55). Further, it has been stated that regarding empathy, psychopathy isn´t a uniform construct, and empathic profiles vary between its sub-factors (56). As John said, his mother was warm and kind even though not always there for him. Therefore, some parts of his personality may have developed as empathic and prosocial. As his callousness and aggressiveness seemed to be somewhat instrumental and activated only when needed or when threatened, and since he seemed to be very resilient towards threats, even in prison showing no anxiety, he may have been able to sustain his prosocial mindset when filling in the self-questionnaires. Taken together, it is possible that YPI-S couldn´t reach a deeper level of John´s personality construct, and other self-report measurements he filled during this intervention should be used in later research to gain deeper insight into his specific features and the possible change in them.

When counting RCIs we used the validation study results of the Swiss German-speaking normal population (37). This

sample was estimated to be culturally closest to the Finnish normal population of the current YPI-S validation studies, since the Swedish validation study (47) didn´t offer means and SDs for sum scores of the sub-categories. Therefore, the results of the reliable changes in this study must be viewed with caution. The aim of the current study project is to validate YPI-S also in the Finnish normal population which will solve this problem in the upcoming studies.

There is some evidence that due to two different aetiological pathways, psychopathic traits can be divided into "primary" and "secondary" variants (57,58). According to this division, primary variant has a stronger temperamental background whereas the secondary variant is caused by a harsh and traumatic rearing environment (57). In PSYCHOPATHY.COMP it is assumed that adolescent psychopathic traits are a consequence of traumatic background, which causes an imbalance in emotion regulation systems (17,32). Therefore, PSYCHOPATHY.COMP may have a greater effect on secondary than on primary psychopathic traits. So far, the research has not distinguished these two variants and whether this intervention should be further tailored for primary variants.

Among forensic psychiatry, there have been occasional worries that treating adult psychopaths with psychotherapy could teach them new methods to manipulate people (59). On the other hand, it has been stated that efforts should be made to influence psychopathic traits already in childhood, when the individual's behaviour has not yet become antisocial, or at least during adolescence, when the individual's brain structures (amygdala, frontal lobe, etc.) and their connections are still maturing (60), and personality development can be influenced (2). It is possible that John wanted to give a better impression of himself during the treatment period, for example, to please his therapist, which then was shown in changes in subjective psychopathic traits. However, he did not get any financial or other external benefit from this, which makes one wonder why he would have done that.

IMPLICATIONS FOR CLINICIANS AND FUTURE RESEARCH

Although the generalizability of this clinical case study is very limited, it supports the previous results indicating that the PSYCHOPATHY.COMP programme is a promising new intervention in the treatment of adolescents´ psychopathic traits to change young offenders´ life paths. The findings suggest that this intervention may foster therapeutic alliance and thus be a promising approach in treating adolescents with antisocial behaviour and psychopathic traits. The results indicate also that VR may be an advantageous tool to enhance CBT-based interventions with threat exposure in forensic settings.

These results suggest that in the future some modifications to the CFT+VR might be considered. The fear of compassion seemed to be a central blockage during the intervention process. As PSYCHOPATHY.COMP is a manualized therapy programme, in cases of severe and persistent fears of compassion, adaptations to the programme could be detailed in the manual. Further research is also needed whether PSYCHOPATHY.COMP should be tailored for primary and secondary variants separately. Also, as the Finnish culture differs from the Portuguese culture, cultural adaptations could be considered to avoid blockages in enhancing motivation for compassion. Concerning VR, future versions of the exposure videos could be professionally produced in cooperation with detained adolescents to make them as believable and effective as possible. Although further research with more measures and a control group is needed, the results for this one adolescent suggest that the CFT+VR programme may be a new promising tool in treating adolescents who have historically been considered hopeless and almost impossible to treat.

Supplementary Material

Supplementary data are available at Psychiatrica Fennica online.

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