

---

# PROBLEM SUSTAINING INTERACTION PATTERNS IN ADOLESCENCE



Name	Nina Schouten
Education	Design for Interaction
Faculty	Industrial Design Engineering
University	Delft University of Technology
Chair	Paul Hekkert
Mentor TU	Ella Jamsin & Nynke Tromp
Company mentor	Femke de Boer
Company	Reframing Studio Redesigning Psychiatry
Student number	4211545
Date	12-09-2019

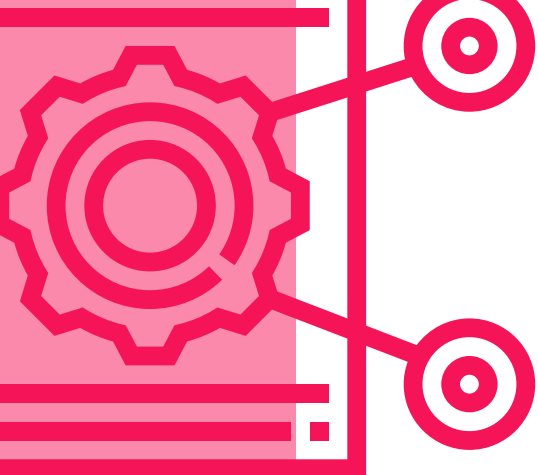
## Abstract

This graduation project explores how the concept of problem sustaining interaction (PSI) patterns in mental development in adolescence can be used for design. In contrast to the currently used Diagnostic and Statistical Manual of Mental Disorders (DSM), which describes psychiatric disorders from only a psychological perspective, the concept of PSI-patterns describes mental health problems as interaction problems. This new holistic approach incorporates interactions within the individual, but also those between people and their environment.

To concretise the concept of PSI-patterns, I used the knowledge of system theory. From the research is concluded that factors on multiple levels influence each other; from biological to cultural. The factors in a system form loops that together reach an equilibrium. PSI-patterns consist of smaller, reinforcing feedback loops of which multiple together cause a system to move towards a problematic state. Changing a system requires effort and outside support. By making the patterns insightful, it becomes clear what strategies can be used to create positive change.

The physical, social and psychological changes during adolescence make them particularly vulnerable to develop mental problems. There is a taboo around talking about mental health and society turns a blind eye. This causes adolescents when they struggle mentally to feel abnormal and alone, to lack knowledge and understanding to talk about their struggles and to feel not taken seriously when told that troubles are 'just part of life'. To support adolescents in their mental development I introduce the design concept "The Bumpy Road".

The Bumpy Road supports adolescents to learn to understand their feelings by recognizing them in others. It is a platform with a variety of podcasts in which adolescents share personal and authentic stories about times in adolescence where they struggled. The problematic patterns of the storyteller are unravelled and explained to listeners in conversation with a pattern expert. The patterns that are discussed in the podcast are linked to other stories on the platform that include their version of the pattern. By making patterns insightful, listeners understand why problems keep occurring and get direction on how to navigate towards a more sustainable situation. The Bumpy Road teaches listeners the language to talk about struggles, normalizes them and provides advice on how to help themselves or support others. This project brings PSI-patterns from a conceptual level towards a concrete and validated design service, and thereby proves that PSI-patterns are a suitable framework for design.



# TABLE OF CONTENTS

INTRODUCTION	6
Process	8
BACKGROUND	10
Movements In Psychiatry	10
Dsm-V Under Attack	10
Redesigning Psychiatry	11
The New Perspective: PSI-Patterns	12
METHOD	14
Objectives	14
Approach	14
INTERVIEWS	16
Expert Interviews	16
Interviews & Tests	16
PSI-PATTERNS IN ADOLESCENCE	18
System Theory	18
Visualisation Of Typical PSI-Patterns In Adolescence	26
Conclusions Of Psi-Patterns In Adolescence	30
Directions For Future Research	32
Conclusion	33
CONTEXT OF MENTAL DEVELOPMENT IN ADOLESCENCE	35
Clusters	35

Framework	54
Exploring The Four Quadrants	58
Conclusion	67
STATEMENT & INTERACTION VISION	68
Positioning	68
Statement	70
Interaction	72
CONCEPTUALISATION	75
Card Game "Connecting Struggles"	76
Application "Fuck It"	80
Podcast "Tell Me How You Fall"	84
Web Plug-In "The Bumpy Road"	87
Concept Decision	89
FINAL CONCEPT	90
The Bumpy Road Concept	90
Why?	91
Scenario	92
Podcast	94
Platform	96
Thom's Podcast	100
EVALUATION	104
The Bumpy Road	104
Preconditions For Designers	106
Personal Reflection	107
CONCLUSION	108
Future Research	110
BIBLIOGRAPHY	112

# INTRODUCTION

Many people suffer from mental health related problems. These problems are currently categorised and described as disorders such as depression, bipolar, ADHD in the Diagnostic and Statistical Manual of Mental Disorders, often referred to as DSM-V (American Psychiatric Association, 2013). The DSM is based on the idea that the psychiatric illnesses are entities, diseases which individuals suffer from. This perspective on mental health is currently up for discussion (Derksen, 2012). Following from the idea that the mental health in The Netherlands needs to be drastically renewed, Redesigning Psychiatry came into existence. Redesigning Psychiatry is a multi-disciplinary project that re-frames mental health in 2030 by developing a future vision in which human values are of major importance.

Redesigning Psychiatry proposes a new framework that characterizes mental health problems as interaction problems. Instead of categorizing illnesses based on their symptoms, this framework views problems as results of interactions within the individual, but also between people and their environment. Problems are part of life, but the situation becomes problematic when people are not capable of navigating out of their problematic states. These situations can be framed as 'Problem Sustaining Interaction patterns (PSI-patterns)' (Redesigning Psychiatry, 2018).

The scope of the project is late adolescence, youngsters from 15 to 25 years old and their (social) environment such as family, friends, teachers, school. Adolescence is a time in which many things change on physical, social and psychological level, in a short period of time, making adolescents vulnerable. This causes most mental problems develop before the age of 25 (RTL Nieuws, 2018). There are prevention opportunities in this age group because there is still room for development before problems get persistent in a later stage of life. 18 is the transitional age from teenager to adult, at which they become officially independent. Mental development in this age group is critical and should be taken seriously.

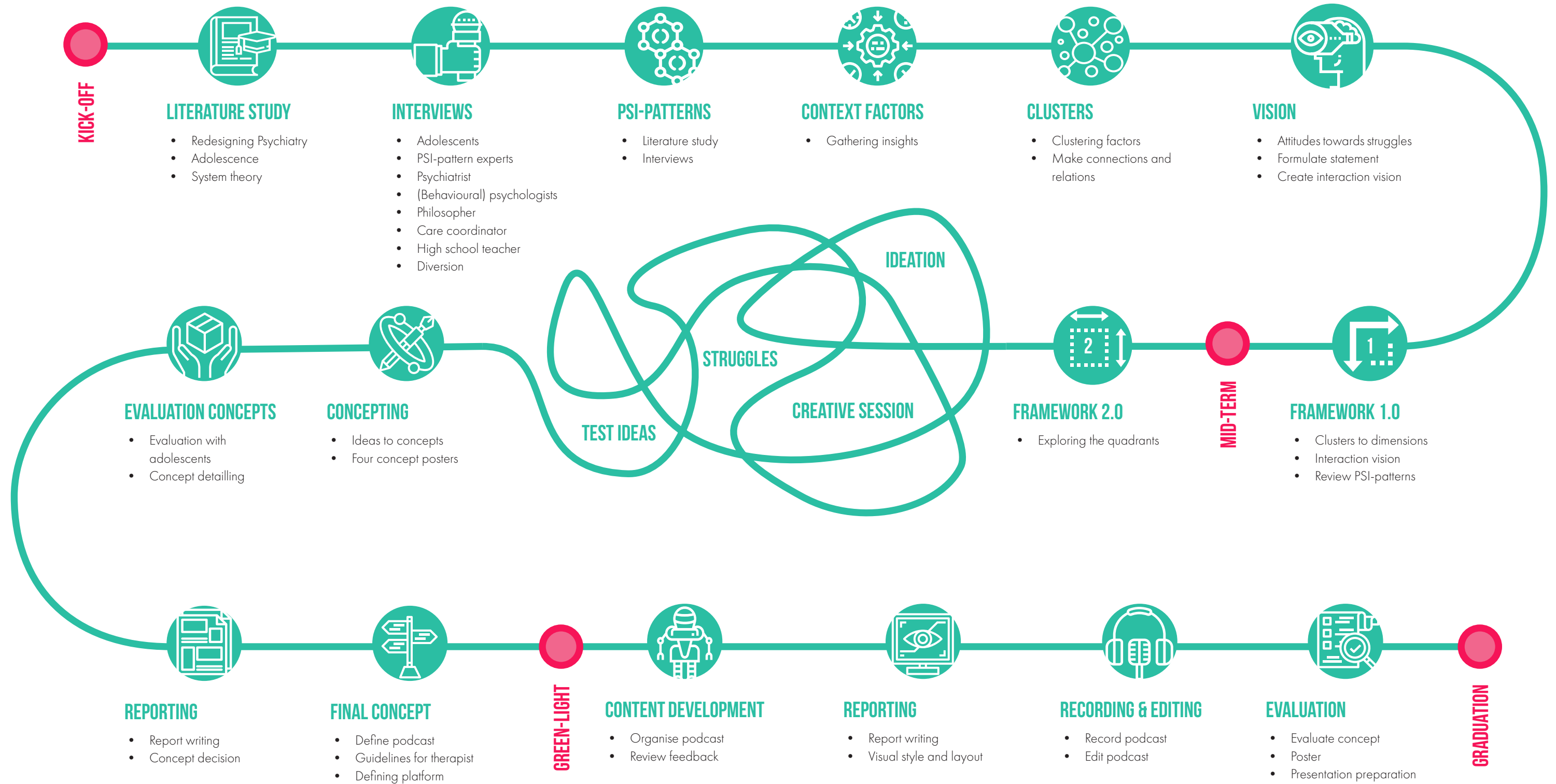
To find out how to use the concept of PSI-patterns for mental development in adolescence, I will attempt to concretize PSI-patterns and design something to support it. Theories of systemic design will be used to investigate the behaviour of patterns in general and to explore how typical PSI-patterns in adolescence can be mapped. In addition to that, I will immerse in the context of mental development of adolescence to create a vision on how to support this mental development by interviewing experts,

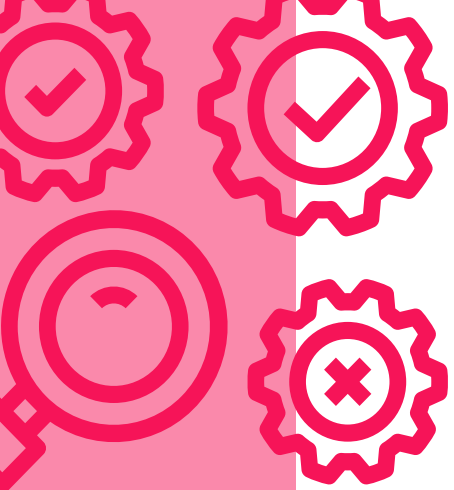
(people in the context of) adolescents and conducting a literature study. These will shape the building blocks to map the future context; mental development of adolescents in 2022. The Vision in Product design (ViP) method will be used to guide how to shape the worldview, create a vision, define the desired interaction vision and design (product) interventions (Hekkert & Van Dijk, 2011). This final design will be tested and evaluated with the target group.

The starting point of my graduation project is the concept of PSI-patterns. By identifying PSI-patterns and using its perspective to design something that supports mental development, the new concept can be used and tested in practice. Designers are trained to think outside the box and create practical, testable solutions for complex or abstract ideas. Therefore, design has the ability to define the language and shape of PSI-patterns.

Redesigning  
Psychiatry

# PROCESS





# BACKGROUND

## Movements in Psychiatry

Psychiatry is the field of diagnosis, treatment and prevention of mental, emotional and behavioural disorders that originates from the medical field (American Psychiatric Organisation, 2018). There are different movements within psychiatry, which have their own opinion about what a mental disorder is, if such illnesses exist altogether and what the purpose of the mental health care system (Dutch: GGZ) should be. Psychiatry originated from the assumption that mental problems arise from a common cause, as physical symptoms originate from a physical cause. The medical model which followed from the psychiatry movement, attempts to diagnose people with illnesses from the mind and stabilise these patients (Alarcón, 2016).

The anti-psychiatry movement originated in the 60's and stated that there is no such thing as a mental illness, that definitions of diagnosis are ungrounded, patients are over-diagnosed and psychiatric treatment often causes more harm than that it solves problems (Whitaker, 2002).

A third, more recent and nuanced movement is the recovery approach. They aim for clinical recovery; symptoms of a disorder influence life, and whether there is an underlying disease or not, the main purpose of the mental health care system is to rehabilitate patients by focusing on the effects that symptoms have on life. The recovery approach looks at the individual from a broader perspective and includes the individual's community and society (Boumans & Baart, 2013).

Depending on the perspective, the mental health care system can be implemented differently. The current system is still based on the medical model, with its' pros and cons.

## DSM-V Under Attack

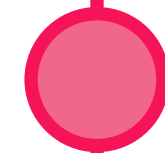
The current mental health care system is based on the "Diagnostic and Statistical Manual of Mental Disorders", often referred to as DSM. It is the diagnostic standard in psychiatry that was originated from the United States. The first version of the DSM has been developed in 1952 by a group of

psychiatrists, psychologists and epidemics. It was an attempt to make a classification of mental disorders based on overlapping symptoms that people suffer from. The DSM has been revised several times and is still subject to change, the newest version that came out is the DSM-V. The original purpose of the DSM was to create consensus on the use of psychiatric terms (for example the meaning of the word 'depression') and define the symptoms that rise with the disease. Nowadays, the health care system, treatments and insurance are based on this classification system.

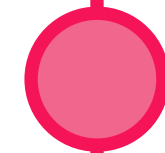
Critics of the DSM argue that by formulating the definition of a psychiatric disorder, the causes and structures that lay at the basis of the problems are being marginalised (Derksen, 2012). The issue with defining is that a label always derives meaning from its' implications. The label, which was meant to only order symptoms, has become the explanation of the problem. Formulating definitions based on symptoms causes that a psychiatric disease can be interpreted as an entity of which an individual suffers. At the same time, categorising people based on psychiatric disorders causes stigmatisation; the label is becoming part of the identity of the person (Dehue, 2017). Critics advocate that we should shift the focus from categorising symptoms towards understanding underlying theories to understand, explain and cope with psychiatric problems.

## Redesigning Psychiatry

Redesigning Psychiatry is a project in which mental health care organisations, philosophers and designers work together to fundamentally review the mental health care system in The Netherlands. Their aim is to create a vision and innovate for psychological well-being of the 21-century and explore which experience and interaction is meaningful to people in the future. They develop and test the new vision by anticipating on the future and thinking outside the boundaries of the current system. New concepts to test this vision are designed, tested in practice and reflected upon to improve the vision ([www.redesigningpsychiatry.org](http://www.redesigningpsychiatry.org)).



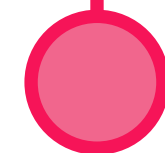
1808  
PSYCHIATRY



1967  
ANTI-PSYCHIATRY



1993  
RECOVERY APPROACH



2015  
REDESIGNING PSYCHIATRY

## The New Perspective: PSI-patterns

In contrast to the DSM-V, which describes psychiatric disorders from a psychological perspective, the concept of PSI-patterns takes into account the system as a whole. It incorporates interactions within the individual, but also those between people and their environment. All relevant factors (biological, neurological, cognitive, social, cultural etc.) that influence (the development and preservation of) problems caused by mental health are considered. Instead of looking at psychiatric disorders as entities that people suffer from, the concept of PSI-patterns emphasizes on understanding the mechanisms behind it (Redesigning Psychiatry, 2018).

Research has shown that psychiatric problems rise slowly and develop over years. They develop and sustain as a result of interactions that strengthen and reinforce each other (Serman, 2000). Problems are a part of life, however, when they sustain, result in more problems, decrease well-being or when someone cannot navigate out of the negative spiral themselves, the situation can be considered problematic. In that case, the interaction pattern that keeps the problem from reoccurring or getting worse should be investigated.

The perspective of PSI-patterns strives get a deeper and broader understanding of mental health. It wants to make the transition from talking about treatments towards the focus on strategies.

The PSI-pattern framework is still on a conceptual level. Its challenge is how to use it in practice, how to concretise the concept and how to design for it. Mental health is a precarious subject; mistakes can have disastrous consequences for people. Therefore, without losing the expertise and knowledge of the current system, the shift should be made with care. By trying out designs from the PSI-pattern perspective and reflecting on them, the vision and design method can be improved.





# METHOD

## Objectives

This graduation project addresses how the concept of PSI-patterns can be used to support healthy mental development in adolescence. Therefore, the concept of PSI-patterns and the context of mental health in adolescence will be explored.

In the analysis will be explored how the PSI-pattern approach can be used when designing for mental development of adolescents and provide directions for future research. In addition to that, it will describe the context of mental development of adolescents in 2022. The research aims to support other designers in designing for mental health of adolescence.

After analysis, the design phase starts. The objective here is to design, define and create a concept that is in line with the research. This design should be a relevant response to the context and be elaborated enough so it can be tested and evaluated.

## Approach

Typical PSI-patterns in adolescence will be identified and visualised and a vision statement on how to support healthy mental development in adolescence in 2022 will be developed. Based on that vision, the interaction and the (product) intervention that achieves the desired effect needs to be designed.

First will be explored what a pattern in general is, how patterns develop and sustain, and when a pattern is problematic, in order to differentiate between what a PSI-pattern comprises and what it is not. What is of influence to mental development during adolescence will then be analysed by interviewing experts, teachers and adolescents. This together provides the information to make a grounded attempt to visualise PSI-patterns that can currently be identified to explore how to concretise the concept. The PSI-patterns are then used to reflect on the final design; if it fits with the target group adolescents and fit with the PSI-pattern framework.

The knowledge obtained in concretizing PSI-patterns will be used to design something that supports healthy mental development in adolescence. By analysing the domain of mental development in adolescence on biological, social and societal level, factors that support or contradict each other within the domain will come to the surface. These interactions shape how to look at the context of mental health from a PSI-pattern perspective and the world they arise in. Within that worldview, I will formulate a vision on how to support mental development and design an intervention that fits this vision.

The final design should correspond with the vision, the world view, and achieve the desired effect. It needs to fit with the PSI-patterns that were identified before and with all the stakeholders that interact with it.

### System Theory

What an interaction patterns looks like, is difficult to grasp at first. System theory comprises theory on the behaviour and visualization of patterns in different research fields. In a literature study on system theory, behaviour of patterns can be explained and predicted. The study explores the use of causal loops, ecology models and network theory for PSI-patterns.

### Vision in Product Design

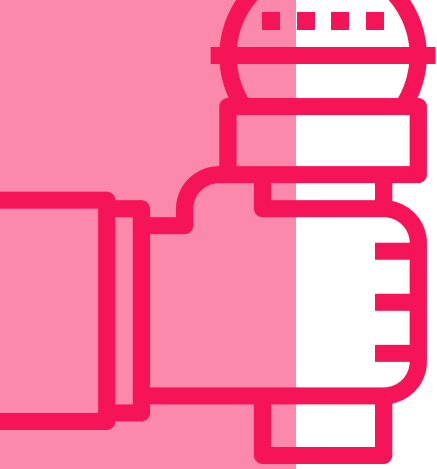
Vision in Product Design (ViP) is the method to come to this design. In comparison to most design methods, there is no predefined problem. ViP is about designing from a personal vision and taking responsibility as a designer.

ViP describes three levels; context, interaction and product level. Starting with deconstruction at the product level, followed by the current interaction and then the context. Designing starts in the construction phase, which comprises the same levels but in the opposing direction (see figure).

Redesigning Psychiatry aims to create a vision on the Dutch mental health care system. The insights gained in the reconstruction phase will be my starting point to shift to construction phase, however focused more specifically on adolescence.

Within this domain, I will explore the context by conducting interviews and doing literature research. These insights are formulated into factors that influence the domain. These factors form clusters, which are the underlying themes that describe the context. The interaction between the clusters is used to describe the worldview. In this world, I will take my position of how to respond. This is the statement -the goal- of the design. Then, the interaction level follows, in which the interaction, meaningful relations and desired experience is defined. In the final phase on product level, this will put in a shape (e.g. object, intervention, service) that fits the intentions the best (Hekkert & van Dijk, 2011).





# INTERVIEWS

## Expert interviews

Tonnie Staring (cognitive psychologist)

Leontien Los (psychiatrist, director Brijder)

Sander Voerman (philosopher)

Annemarie Karelse (behavioral psychologist)

Marion Welling (pedagogue, author)

Jolijn Verduin (care coordinator)

Niels van den Burg (high school teacher)

Deborah Reesink (Diversion)

Noa Bar Ephraim (Diversion)

## Interviews & tests

Adolescents (Joes, Lente, Molly, Ole)

Creative Session (Eva, Joy, Lieviijn)

Board game 1 (Joy, Lieviijn)

Card game 1 (Fenna, Margôt, Steffen)

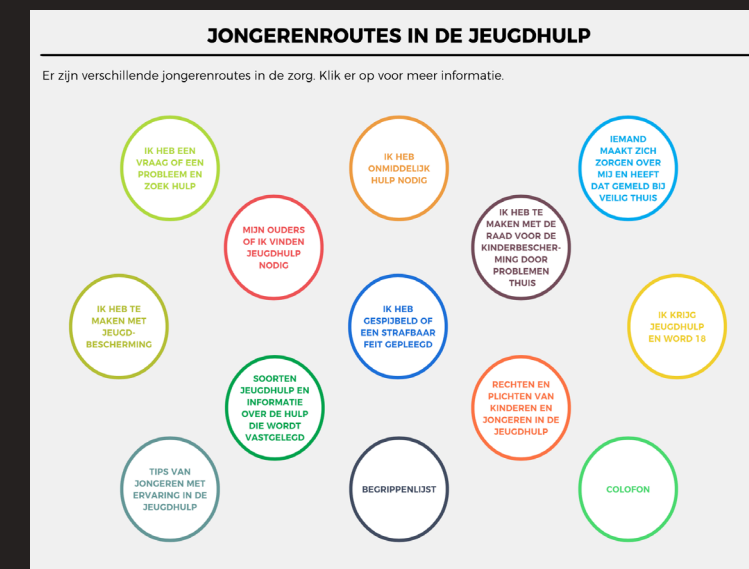
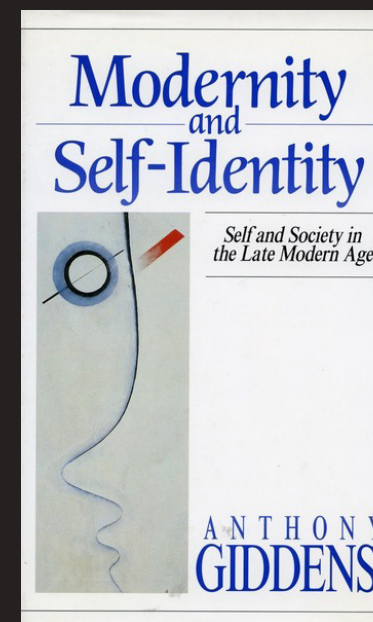
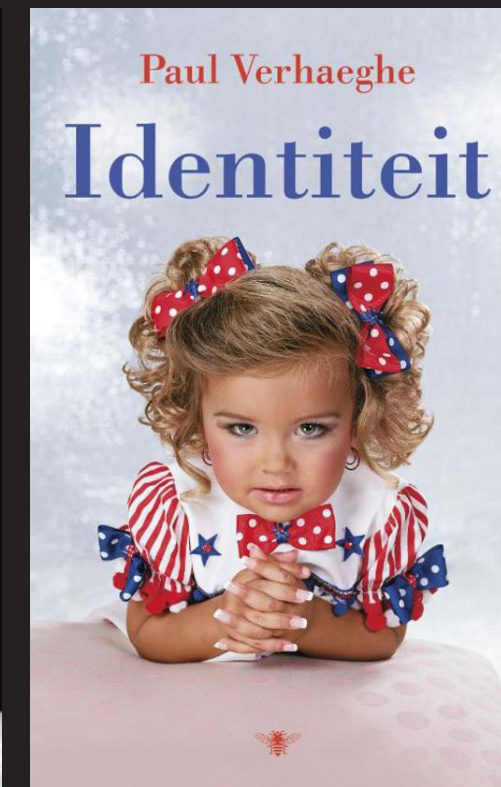
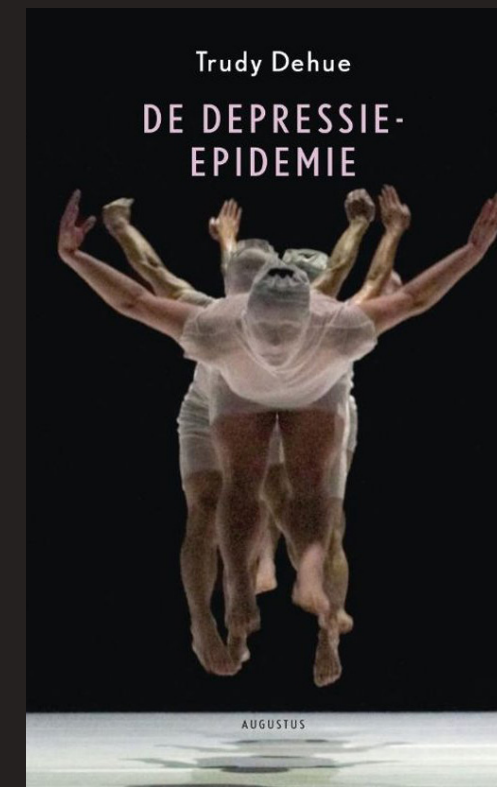
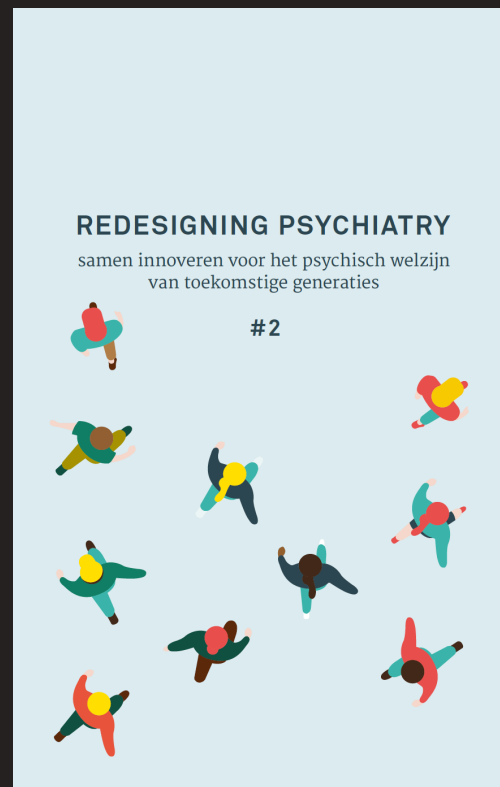
Board game 2 (Fenna, Margôt, Steffen)

Card game 2 (Fenna, Margôt, Steffen)

Concept feedback (Joes, Lente, Molly, Ole)

Evaluation (Joes, Joy, Lente, Margôt, Molly, Ole)

Adolescents (Scholen aan Zee Den Helder)





# PSI-PATTERNS IN ADOLESCENCE

To concretise the concept of PSI-patterns, typical patterns in adolescence will be identified and visualised. Existing theory on networks and systems explains how patterns sustain and develop, and how they can be visualised. Based on literature and interviews, I will visualise several PSI-patterns in adolescence.

## System Theory

Existing theory on systems and networks helps to identify and visualise PSI-patterns. Literature on causal loops diagrams explains why and how patterns are reinforcing or in balance. Causal loops can be identified in many different processes, from climate change to the development of a depression. Ecologists use the knowledge of causation to look at interactions between different factors in ecological systems from micro to macro-level. The multi-level perspective of ecologists forces us to take into account factors in all the domains that can influence a system. Behaviour of sustaining patterns in nature can be compared to mental health patterns in humans, as well as the behaviour when a balanced system gets distorted. Next to ecology models, network theory can be used to understand patterns in mental health. Network theorists base their theory on ecological models. The symptom network theory in specific, takes symptoms as the starting point to investigate the behaviour and interaction between elements in a system. Symptoms of mental disorders often rise together and seem to interact with each other.

Causal loop diagrams, ecology models and symptom network theory will be further explained in order to create a better understanding of the behaviour of patterns in general and provide guidelines to identify and visualise PSI-patterns.

## Causal Loop Diagrams

Causal loop diagrams (CLD's) are used to model feedback systems. It aims to create a language to understand and articulate mechanisms in the world. Variables in the CLD are connected by arrows that represent their causal relation (Sterman, 2000). These causal links have a positive or negative sign that indicates the polarity between the variables. A closed cycle of elements in a system illustrates a feedback loop, either reinforcing or balancing. Reinforcing feedback loops indicate that the variables in the loop to increase or decrease, and a balancing loop that the system will move towards an equilibrium (Kim, 1995). Wittenborn, Rahmandad, Rick & Hosseinichimeh (2016) used the theory of CLD's to map the feedback loops of a major depressive disorder in order to understand the mechanisms that underlie depression. The final model includes variables from cognitive, social, environmental and biological dimensions. It shows that various reinforcing loops can push the system towards a problematic (problem causing) situation that is associated with depression. This is often caused by a trigger outside of the balanced system. After time has passed, the system reaches a new equilibrium which sustains because of its balanced feedback loops. Due to these loops, the problematic state is hard to break even when the outside trigger has vanished.

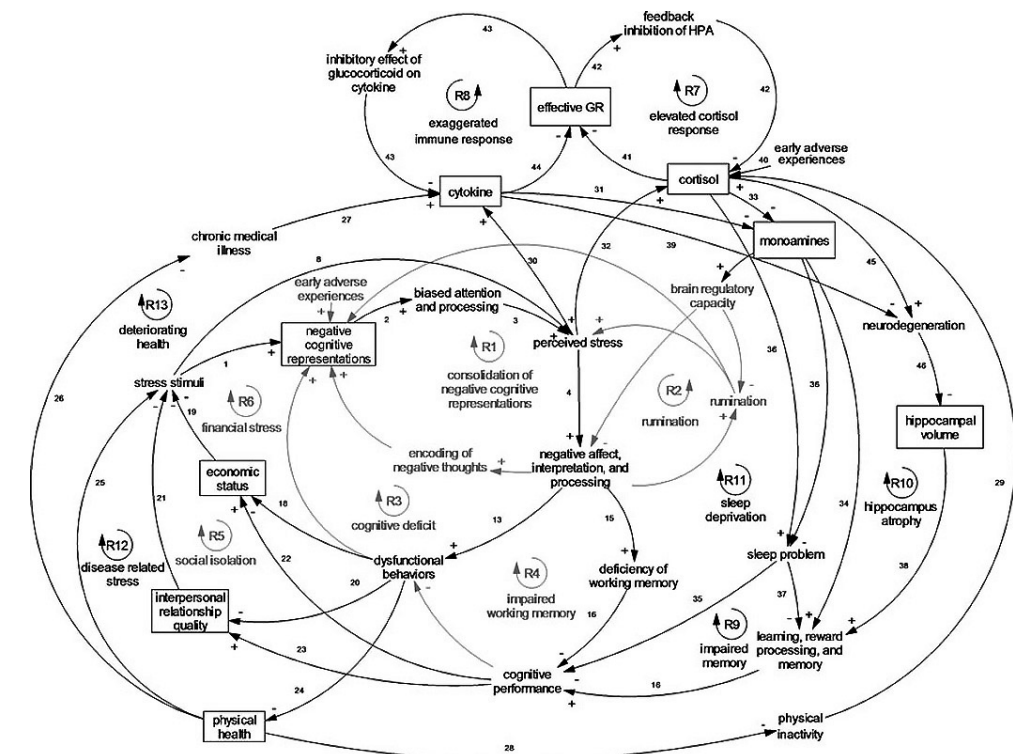


Figure 1 Wittenborn, A. K., Rahmandad, H., Rick, J., & Hosseinichimeh, N. (2015). Depression as a systemic syndrome: mapping the feedback loops of major depressive disorder. *Psychological medicine*, 46(3), 551-62.

More recently in practice, the use of causal loops in psychological issues has proven its relevance. For example, Leemput & Wichers (2013) in their paper “Critical slowing down as early warning for the onset and termination of depression”, use the knowledge of complex systems as climate or ecosystems to view the dynamics of mood transitions. The paper showed that gradually changing external conditions may cause a system to approach a tipping point. They even suggested that the tipping points of falling into depression might be able to predict.

*“This [critical slowing down] supports the view that the mood system may have tipping points where reinforcing feedbacks among a web of symptoms can propagate a person into a disorder.” (Leemput et. al, 2013).*

Although prediction is questioned by other researchers in the field, the hypothesis that mood has alternative stable states in which someone can rapidly fall into after a certain point, are in line with the reinforcing feedback loops described before. The concept of relations of symptoms described as alternative states of complex dynamical systems is shared with the network theorists described in the later.

#### Ecology Models

By looking at how ecological systems behave, we can learn a lot about ourselves as human beings. Biological systems look for balance and equilibria in a comparable way as the systems inside, in between and around our bodies. While ecologists investigate systems interactions on this multi-level for a long time, psychopathology mainly separated the different domains.

As Bronfenbrenner’s theory describes, a child’s development is depending on, and influenced by, the context of its’ environment. This so-called bioecological systems theory explains that if we study the development of people, we should take into account their immediate environment, but also the interactions with the larger environment (Ryan, 2001).

Bronfenbrenner (1979) proposes a phenomenological approach which separates the structure of the environment into five sub-systems; the micro-, meso-, exo-, macro- and chronosystem. Conflicts, changes or problems that occur in one system, influences other layers. The microsystem includes the interactions closest to the person. These include for example family, friends, school and neighbourhood. Essential to this microsystem is the way in which objective properties are experienced and perceived by the person itself.

*“A microsystem is a pattern of activities, roles, and interpersonal relation experienced by the developing person in a given setting wat particular physical and material characteristics.” (Bronfenbrenner, 1979)*

The mesosystem consists of the interactions and interrelations between the elements, people or structures in the microsystem. The next layer is the exosystem; the system which comprises the events or structures (in for example society, culture and community) that influence the person indirectly, they

affect the setting around him or her. The macrosystem influences on a more global level, which include the (sub)cultural values, customs and laws including its beliefs or ideological systems. The final system in the environment structure of Bronfenner is the chronosystem. This system relates the dimension of time to the different layers of the system. It consists of the events and transitions in a lifetime (for example the death of a parent) and sociohistorical circumstances (Ryan, 2001).

Bronfenner’s theory forces us to look at all the domains of the context in which interactions can occur. Looking at people in their broader environment instead of only at direct interactions, provides a more clarifying perspective on mental (dys)functioning. Viewing the development of people within the five sub-systems, makes it harder to overlook important factors that could be of influence on (the development of) a problematic pattern.

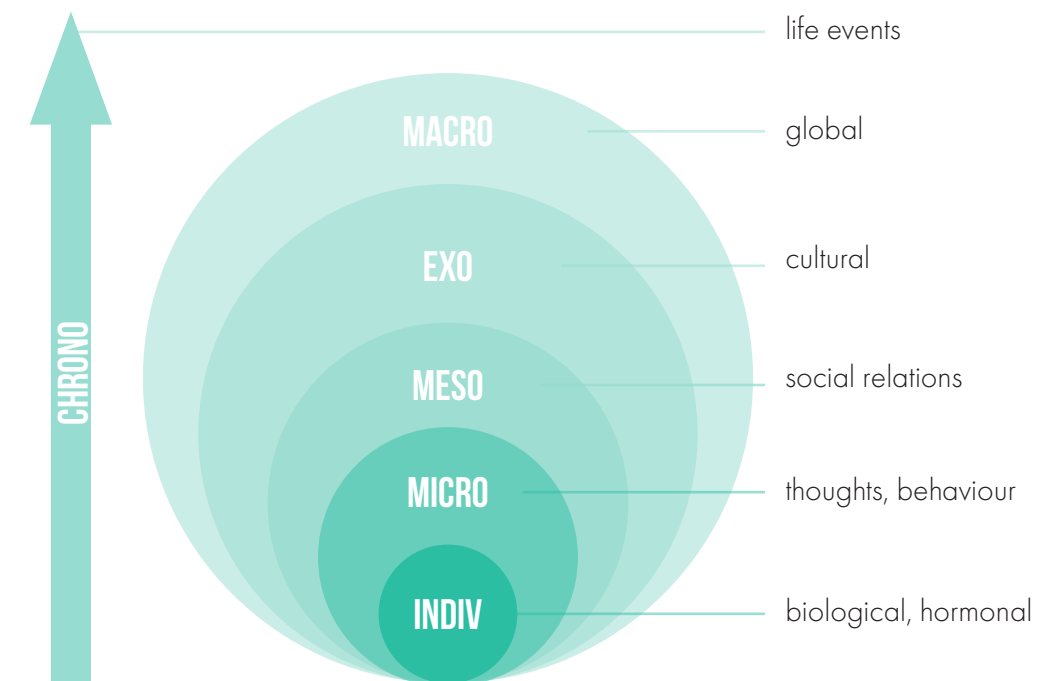


Figure 2: Structure of the environment in sub-systems (Bronfenbrenner, 1979)

#### Symptom Network Theory

“We as human beings are one big controlled and balanced system, if that does not function, we get ill. Out of basic principles, we can build a general model of the human mind. From a healthy mind towards how it can get ill. Although it is still very anecdotic, nowadays we can bring terms like psychopathology, homeostasis and disruption in relation.” (Rutger Goekoop, 2019)

Network theory is originated from computer science and aims to model and analyse complex systems. They use the theory of CLD's and ecology models and combine it with new knowledge on big data and computer science. Network theory is applicable to disciplines from physics, ecology, social to networks in psychopathology.

Borsboom & Cramer (2013) explain:

*"[...]our goal is to define a single mathematical framework and corresponding language with which to describe the large number of (neuro)biological and social factors that contribute to the occurrence of psychotic symptoms as the result of interactions between events that take place at multiple spatial scale levels of organization." (Borsboom & Cramer, 2013)*

These symptoms are causally related in biological, psychological and societal mechanisms. Instead of using the terms "disease" or "mental disorder" to describe psychiatric symptoms as the effect of a common cause, network theory argues that symptoms cause each other. In the structure of this network, symptoms are represented as nodes that are connected if they activate each other. The symptoms can form feedback loops in the network that cause a pattern of problems to arise that can be hard to break (see also causal loops). Factors in the external field can trigger symptoms in the network and activate the network.

The dynamics of symptom networks is described by Borsboom (2017) in four phases. In phase one, there are no activated symptoms, but they are connected in a certain way. In the second phase, something in the external field triggers the network to be activated. After that, in phase three, the symptom activation will spread through the network. When it is a strongly connected network, the system can enter phase four; the network gets in a self-sustaining state and symptoms keep activating each other through feedback loops long after the trigger has vanished. The stronger a network is connected and the bigger the stressors in the external field, the greater the vulnerability to fall into this fourth phase, the state of a mental disorder (see figure 3).

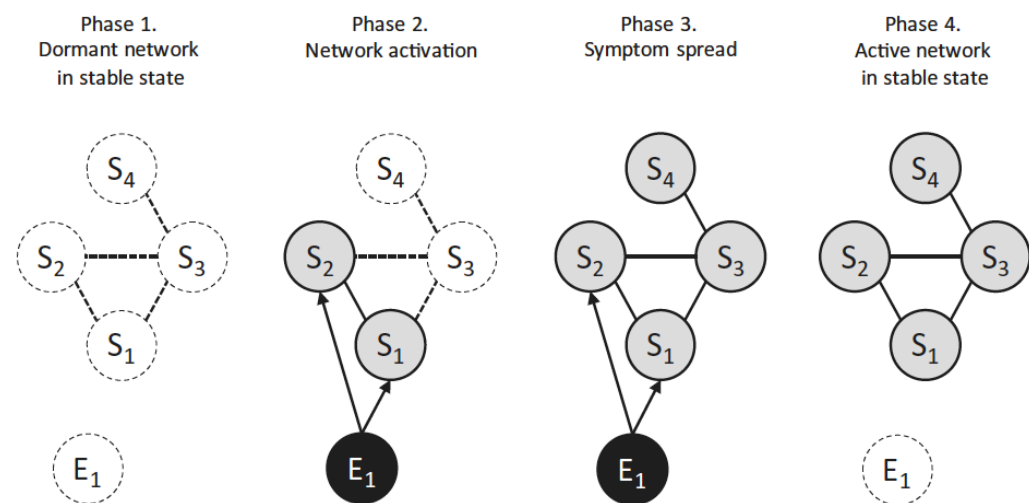


Figure 3: Phases in the development of mental disorders according to the network theory (Borsboom, 2017)

Some symptoms are in general more tightly connected than others and form symptom groups or sub-networks. This provides us with the opportunity to create reliable patterns in the larger psychopathology network and describe mental disorders as groups of symptoms that often rise together.

By mapping networks, treatments can be focused on symptom interventions (changing the state of a symptom), interventions in the external field (removing triggers) and network interventions (modifying symptom connections) (Borsboom, 2017).

Rutger Goekoop builds on this in an interview (appendix 6) that network structures behave in the same way on all levels, smaller systems and bigger ones. There are universal laws in nature which can be seen from molecular to social level and further. This gives the possibility to create an integrated model of our mental health. The model incorporates factors from the biological, psychological and social world. In comparison to the past, we now have the chance to start this enormous project due to new knowledge on the network theory on and big data. Goekoop explains that instead of determining the hypothesis on the problem and doing an intervention, the intervention will be tested statistically on its' effectiveness.

By gathering big data on (relations between) symptoms, averages on connectedness between symptoms can be calculated, averages of sorts of clusters traced and together define general patterns. Goekoop argues that specific patterns differ per individual, but that they are variations of basic themes of patterns.

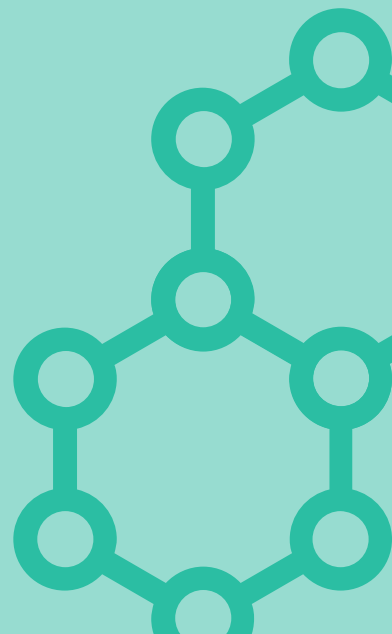
### Conclusion

Conclusions drawn from system theory can function as guidelines for PSI-patterns. Mental health is a dynamic system, and systems strive for balance. As shown in ecological systems, factors from different domains influence the system, directly or indirectly. These factors influence each other and create feedback loops. Problems are not the effect of one cause, but are part of loops. Loops are in balance or reinforcing. The balancing loops cause a system to sustain, which makes it hard to break. For PSI-patterns, the reinforcing loops are the most interesting. Those loops cause the system to get worse, however on the contrary, those are also the loops that create positive change. Reinforcing loops cause the system to change, and also show that even a small change can cause the entire system to spiral out of the problematic state.

The sustaining interaction pattern can be considered trustworthy when it comprises factors in all domains. As the system ecology of Bronfenbrenner shows; factors on all levels can influence each other. At the individual level, these are the biological, neurological and hormonal factors. On the micro level there are the thoughts, behaviour and actions of a person. The meso-level incorporates social relations, exo comprises the cultural factors, macro the global influences and chrono important life events. Designs for PSI-patterns should consider influence of factors on all of these levels.

Network theory provides an opportunity to go across the borders of traditional (human) thinking and provides a constructive direction of how to do that. However, a pitfall of the network theory is that the symptoms used in the model are based on those described in the medical model. It is the opportunity to get create an integrated model of our mental health, but also raises questions about the definition.

PSI-patterns describe interaction patterns that underly problematic situations. The question remains when something can be considered problematic. When a patient comes to the health care taker with a problem, this can be the starting point to investigate the underlying pattern, but what if the problem is appointed by someone else, or by society? Goekoop and Borsboom take symptoms as starting point, however stigmatization is lurking. Relations between symptoms do not necessarily explain the underlying interaction pattern. PSI-patterns have to keep the individual perspective, in relation to its context. The story and experience of the person is central, and the language should fit. PSI-patterns should therefore be open to change and individuality.



## Visualisation of Typical PSI-Patterns in Adolescence

Based on literature and interviews with experts, PSI-patterns are described that are likely to develop in adolescence. Creating the patterns goes hand in hand with the construction of the context (Chapter “Use PSI-patterns to support healthy mental development”). Conclusions of the research can be found at <https://airtable.com/shrAldDyzYpVBZUzV> or in appendix 7.

The patterns in this chapter are examples, which means that they are not created as a new categorisation method or generalisation. They described here are combinations of several feedback loops that together cause a person to suffer from problems concerning mental health. In two visualisations, the feedback loops that are likely to occur around problems related to addiction, anxiety and eating are displayed separately. There is overlap between the patterns; some feedback loops can develop in different. The PSI-patterns are under construction, it is a tool to get insight in what is happening when problems appear, and to check if the design later supports mental health of adolescents that are likely to develop (one of these) patterns. It is an approximation, not a definition. Mental development differs per person, no life is the same and situations differ in person, place and moment.

### Reading Guidelines

The PSI-patterns in this section follow the rules from Causal Loop Diagrams (CLD’s). A black arrow corresponds to a positive relation between the variables, and the white arrows have a negative polarity. A line that crosses an arrow indicates a delay; the relation occurs after some time. The feedback loops are named in squared boxes; most of them are reinforcing. If there is a balancing feedback loop that plays an essential role to the system, there is a “B:” in front of the loop name.

### PSI-pattern of Addiction

The PSI-pattern of addiction during adolescence is built around drug use. This is the starting point around which the pattern is built. The most obvious loop of addiction is shown bottom left side, including the immediate euphoria or drug high, which fades over time and thereby increases the craving for drugs again. The drug high increases the perceived quality of life which in combination with the target quality of life that is foreshadowed by society increases the quality of life gap which increases drug use too. Over time, much drug usage causes the actual quality of life to decrease, which causes the system to deteriorate even more (Powell, 2001). The system that Powell describes is not taking into account influences on social, cultural and societal level yet, only the circle of drug usage itself.

Concluded from interviews (appendix 6), three consequences of extensive drug use that often occur can be defined: a decrease in long term thinking, an increase of sleeping problems and a lack of school motivation. These are at the same time the three elements that have proven to support the drug intake. There are also three factors that are indications of increased vulnerability to develop to drug-related problems. These are low socio-economic status, parents with addiction or psychiatric problems (van de Leemput et al., 2014) and cognitive decline (downgrading at school). By including these six factors into the visualisation and combining them with the essential needs of adolescents; peer support, parental

support, search for belonging and need for personal development (e.g. develop self-identity), I created this visualisation of how these elements could interact with each other and together form a problem-causing pattern relating to drug use.

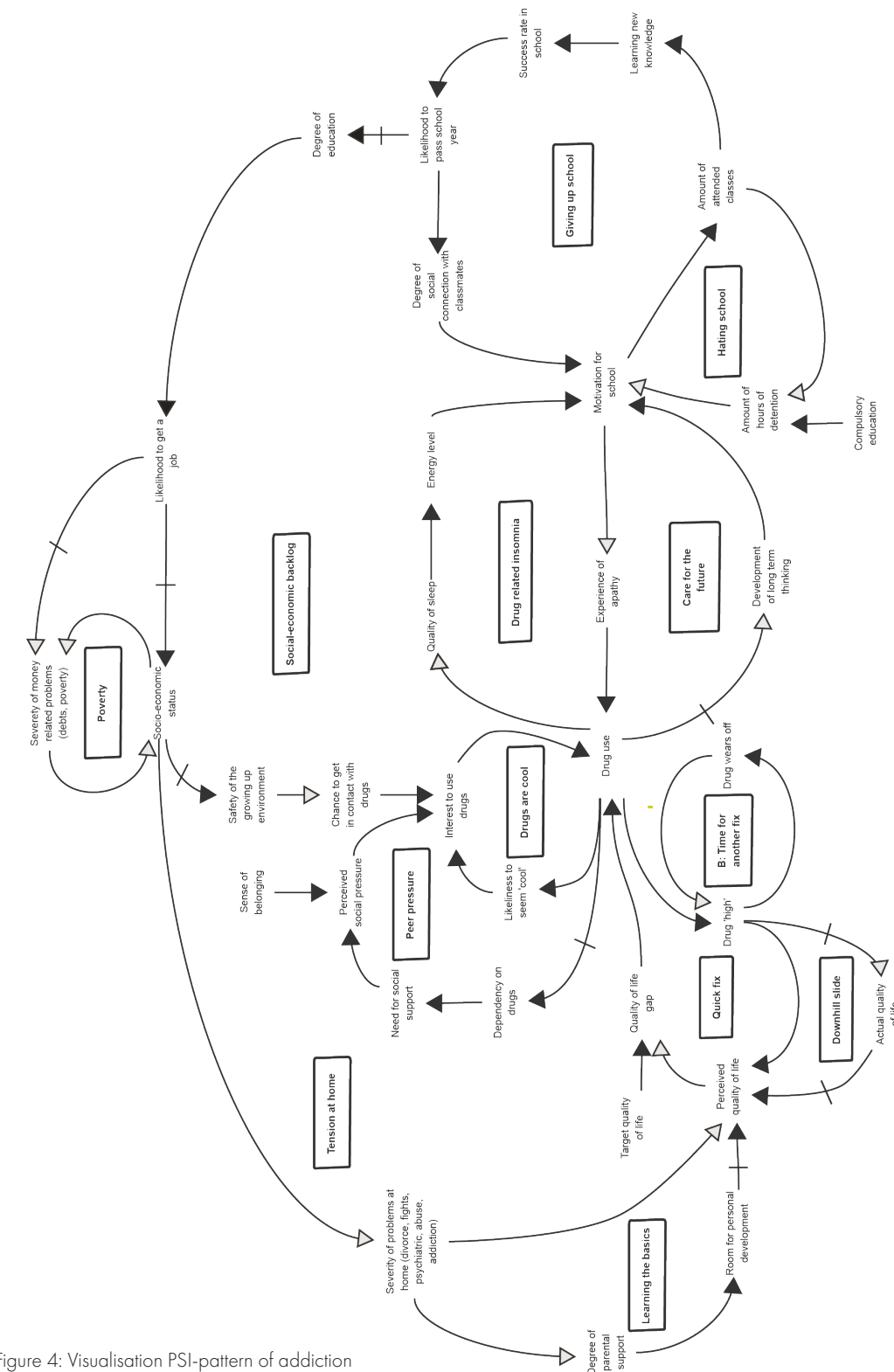


Figure 4: Visualisation PSI-pattern of addiction

### PSI-pattern of Anxiety

In their article, Fava & Morton (2009) compared different theories of panic disorders by the use of causal modelling. They first discuss the psychodynamic, cognitive and biological theories separately, and made an attempt to finally combine them. For this PSI-pattern, the vicious circle of panic proposed by Clark (1986) is used as the starting point. However, there is some discussion about how this system is triggered and how the factors out of this cycle interact with each other. Fava & Morton (2009) reflected on theories of McNally, Schmidt and Bowlby and concluded that there are three internal conditions of patients that causes the circle to be triggered; low self-efficacy, high anxiety sensitivity and learned threat. The learned threat in this visualisation are the phobia related to trauma which causes increase of amount of moments associated with the phobia and in degree of trauma's in the past, which is related to the anxiety sensitivity again.

From a biological perspective, Steimer (2002) examines the biology of fear and anxiety from a systemic and cellular/molecular point of view. He concludes that “anxiety is a psychological, physiological and behavioural state induced in animals and humans by a threat to well-being or survival, either actual or potential” and adds to that anxiety becomes pathological when it interferes with someone’s ability to cope with life challenges. The vulnerability towards pathological anxiety he argues, is a consequence of factors (traits) that resulted from interactions between genes and environment during development (particularly those before and around birth) and experience (life events). I compared the causal relations described in Steimer’s model (2002) to those of the models of Fava & Morton (2009) and combined these with the insights based on the interview with Tonnie Staring, clinical psychologist.

Closely related to panic or phobias is isolation. This is not necessarily connected, however, by avoiding situations related to the anxiety trigger, the engagement in ‘normal’ activities can decrease.

This part reinforces the pattern by distorting social activities which are very important in the adolescents’ life phase. Youngsters spiral down when they are not able to keep up with the rest, who are developing very quickly too. In adolescence, the social network is in the making, the social safety net might not be very strong yet. In combination with their search for purpose and low self-esteem because of their changing bodies. All these elements can be of influence on the development of a PSI-pattern like this.

### Problems with Visualising PSI-patterns

There are some difficulties I came across with visualising PSI-patterns. Firstly, when creating a pattern that is grounded in literature and knowledge, it is hard to not slip into stigmatisation. By shaping the concept into a concrete visualisation, decisions have to be made and it loses some depth of the concept. When talking about mental health, the experience of the person is the central point. By defining, the language is defined, while terminology and language suits different people and situations differently. Secondly, throughout the creation of the PSI-patterns, I realised that a pattern is never complete, and that generalisation is difficult. When creating an overview, you have to decide how far to expand, what to incorporate and what to leave out. On a micro level, there are underlying processes on biological, hormonal or neurological level and on a macro level, there are underlying values and norms that can

both explain certain thinking or behaviour. I took these into consideration but to retain visibility, I decided to only incorporate them when directly influences a factor.

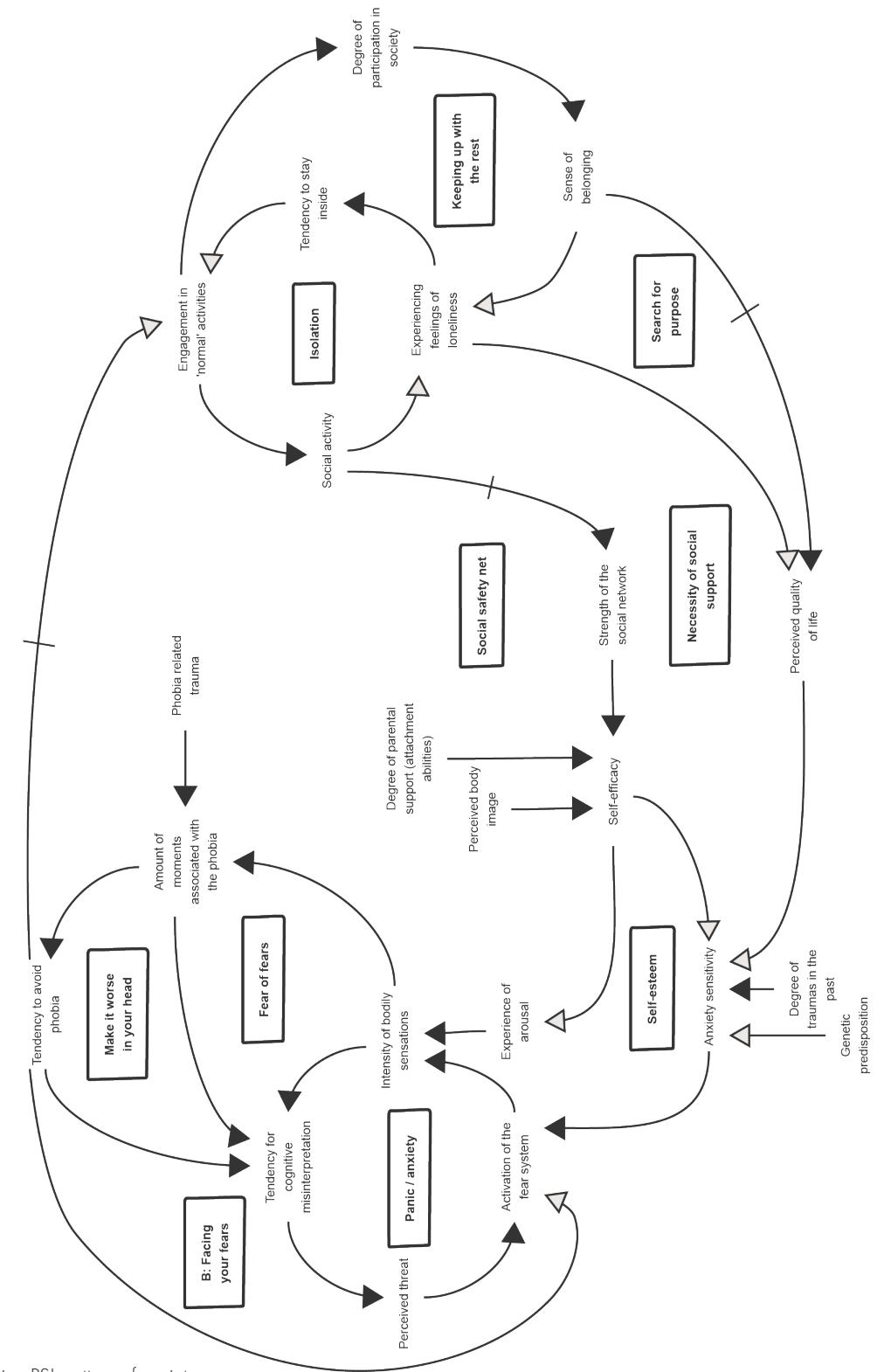


Figure 5: Visualisation PSI-pattern of anxiety

## Conclusions of PSI-patterns in Adolescence

Although there are some difficulties with drawing PSI-patterns; there are insightful conclusions that can be drawn from the PSI-pattern approach to use when designing for adolescents that struggle with their mental health. These are described here.

### Systems strive for balance

Problems with mental health occur as a result from patterns in the context of people's lives, rather than a common cause or disease that the medical model assumes. As the PSI-pattern Z in the previous chapter show; there is no direct cause that can be solved or taken out of the system (with for example medication), but it is a combination of factors together. Factors reinforce each other and form loops. The system together searches for balance and reaches an equilibrium. A trigger from outside of the system can cause the system to change, after which it reaches a new equilibrium. People have alternative stable states, and these can be positive and negative. By making the patterns insightful, it becomes clear what strategies can be used to create positive change. However, this also shows why mental problems are often not as easily cured with medication or a simple intervention. Changing the system requires effort and often support from outside.

### Reinforcing patterns indicate change

Patterns are either reinforcing or in balance. The reinforcing loops cause the system to change. In case of a negative spiral, problems get more severe and it gets harder to get out of the problematic situation. On the other hand, if you manage to change something that makes the reinforcing loop spiral towards a positive situation, it can have great positive impact on multiple parts of the system quickly too. This explains why symptoms often rise and fade together. Reinforcing patterns cause systems to deteriorate but are also the chance for improvement.

### Factors on multiple levels influence each other

The PSI-patterns show why the diagnostic model often fails in categorisation. Where the diagnostic and recovery models are mainly focused on curing symptoms, PSI incorporates the entire system. There are factors on multiple levels that influence each other; from biological to cultural. Symptoms are a result of a pattern, rather than from a direct cause. An example is the diagnostic label "depression". The factors that influence the development and sustaining character of depression, differ from situation to situation. As shown in the two PSI-patterns; "lack of motivation", which is a symptom of depression, can cause the system to deteriorate or keeps it in its problematic state. This lack of motivation though can be a result of a variety of other factors, from lack of sleep to loneliness. Therefore, we should consider the interaction between factors on all levels when creating strategies to reduce problems rather than trying to find one single cause and cure it.

### Adolescents are vulnerable

The PSI-patterns explain why this age group is so vulnerable to develop problems; all the essentials for personal development are developing in that phase and have influence on multiple parts of the patterns. Adults that have a social network, an education and developed their identity, have something to fall back on. They can afford more easily to miss a year without getting severe problems. Adolescents are more vulnerable themselves because of everything that changes in themselves, and cannot miss out or fail because they are in the middle of developing these three essentials (see figure 6). For example, failing school not only causes problems when getting a job later, but also distorts the ability to make friends and create a social network and finding out who you are. As the PSI-patterns show, these elementary aspects influence multiple parts of their lives at the same time.

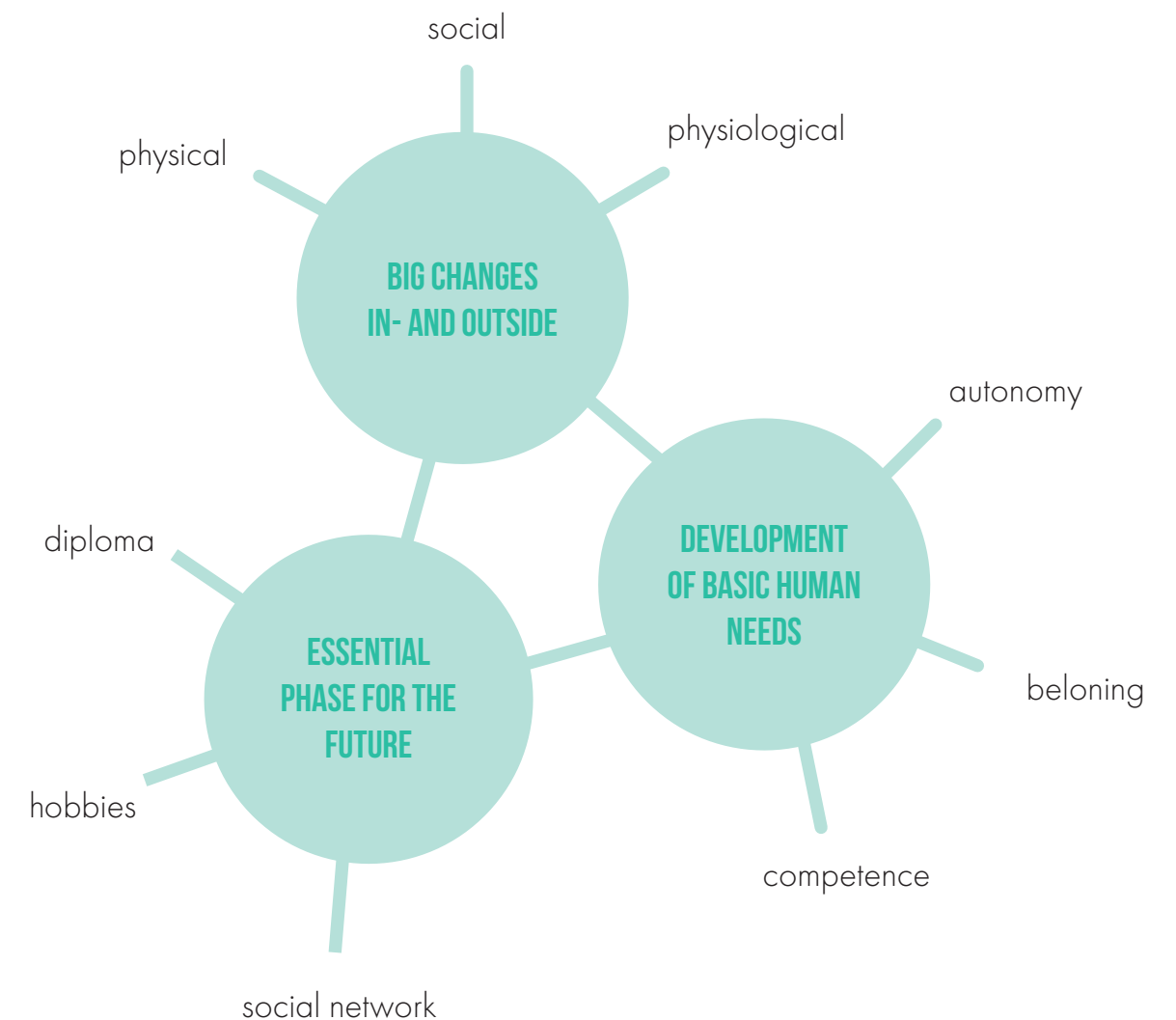


Figure 6: Vulnerability of adolescence



## Directions for Future Research

### Universal mechanisms

No lives are the same, and therefore everyone has their own personal patterns. This does not mean that there is no overlap. As the visualisations show; some relations are more likely to occur than others. There is a lot of research on mental health gained through the years. Many treatments that are currently used show positive results and the knowledge that there is about mental health should not be pushed aside. PSI-patterns vary per person but are often variations of more universal mechanisms.

For example, the upper left part of the anxiety pattern shows how panic attacks keep reoccurring. The same mechanism, however, is also prevalent in other situations. In order to learn that something is not as scary as one might think; it is essential to experience that. This means facing your fears in case of anxiety, but in case of emotional distress, this means understanding that someone still loves you even if you make mistakes. The natural response is the opposite; avoidance. This mechanism causes the fear to increase even more. Future research that focuses on identifying the likely-to-occur mechanisms.

### Underlying factors

A direction for future research could be to look deeper into the macro-level factors that underlie certain reinforcing loops (for example, the norm of a slim body, and the norm that acting anxious is abnormal behaviour might often underlie the development of a low self-esteem). Or the same influences on a micro-level (for example, a genetic tendency for paranoia might underlie drug related insomnia). Research can provide an overview of often occurring factors that underlie PSI-patterns.

### Risk profiles

Treatments are currently based on research on the correlation between people that suffer from the same disorder and the effectiveness of a particular treatment. This creates positive results until a certain extent. Because the definitions of diagnoses are still under attack, it is difficult to prove that a treatment works for the described diagnosis. The diagnoses are based on symptoms, while the PSI-pattern framework asks for inclusion of external factors. If future research would focus on (a combination of) factors that are often a part of problematic patterns, create risk profiles could be created of which benefit from certain treatments more objectively. How to identify these profiles should be investigated.

The PSI-patterns show that the external factors poverty, a low socio-economic status, a social network and supportive parents are of impact to the (development of) a PSI-pattern. These can be considered risk factors for adolescents. Next to that, lack of motivation, missing school and cognitive decline (failing school) are obvious indications for problematic patterns. When these appear in adolescents, this should be signalled for extra attention. Research on risk profiles can show which groups are more vulnerable to develop problems and suggest interventions. Future research on risk factors and their

indications will help to refine risk profiles and show strategies for early interventions.

### Strategies

Based on the universal mechanisms, underlying factors and risk profiles, strategies that suit them can be explored. This can be based on existing treatments or new strategies to break or change patterns. Because PSI-pattern approaches the entire system, the person is placed outside of his disease and the strategies can also be pointed outside of psychopathology (for example, interventions in a neighbourhood or in society).

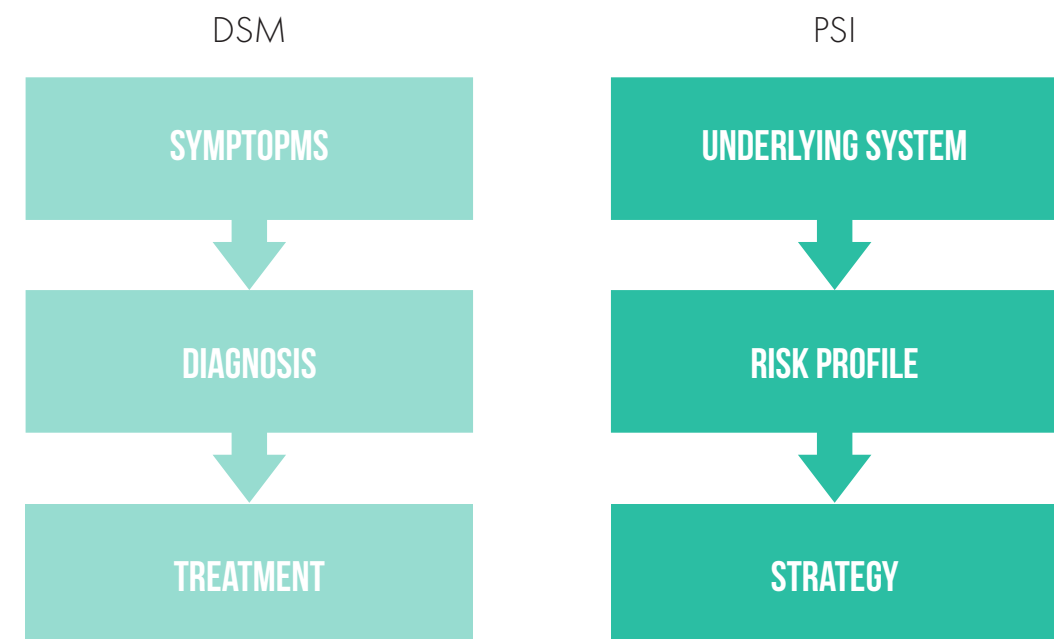


Figure 7: DSM vs PSI-pattern approach

## Conclusion

This chapter explore how PSI-patterns develop and behave in detail, what the pitfalls of visualising patterns are and where the opportunities lie.

In the next chapter, the (future) context of mental development in adolescence will be examined in order to get to know why and where adolescents struggle with. The foundation for conceptualization will be the combination of a vision statement on how to respond to this future world, and the insights on PSI-patterns described in the before.

# CONTEXT OF MENTAL DEVELOPMENT IN ADOLESCENCE

With the information from the previous chapters in mind, I returned to the insights from the interviews and literature. In comparison to the attempt to concretize the information into visualised patterns, I will now look at what the conclusions mean in relation to each other. The results can be found in <https://airtable.com/shrAldDyzYpVBZUzV> or in appendix 7. These factors are facts that in some way or another influence the context of mental development in adolescence. To get a grip of these 51 factors, they are grouped together into nine clusters. Some of the factors follow up on each other, others create tension. The factors are not combined on type or field, but on the underlying theme it responds to. The clusters describe the future context of 2022 in small stories. It explains the changing world that adolescents experience and how their behaviour develops. These nine clusters form the basis to identify the behaviour that responds to the context; the concerns that arise in adolescence and from which perspectives design can act upon them.



# 1. The Cycle of a Bad Start

## *Problems transfer from generation to generation*

Problems do not rise out of the blue. Children in families with a lower socio-economic status, addiction, psychiatric issues or other issues in the house-hold are more vulnerable to develop psychiatric problems. The structures in the family situation influence the degree of personal development of the adolescent. For example, poverty causes chaotic thinking and a distorted experience of time. It increases stress, decreases healthy living and has a negative influence on intelligence.

In adolescence, the focus of relations shift from parents to peers. Successful peer relations are vital for social and personality developments. However, parental support too is of great importance to develop a feeling of well-being. Tension at home can create a lack of parental support and adolescents try to find support in the peers. These peers are often of the same socio-economic status; they go to the same schools and find like-minded people. Adolescents that did learn in their childhood how to talk about and handle their problems, often find peers that have the same abilities; and the other way around.

The adolescents that are vulnerable to developing problems due to their background or genetic predisposition are the same ones that need support the most, but do not have the capabilities to effectively communicate their issues.

The lack of parental support decreases the degree to which children develop themselves are unable to teach that to the next generation. At risk families repeat from generation to generation and these are hard to break without outside support.

---

### Context factors

#### Important peer relations

Successful peer relations are of great importance to social and personality development (Perker & Asher, 1980)

#### Parents psycho-social wellbeing affects children

The psycho-social wellbeing of parents correlates to the amount of psychological problems of children. (Downey, G., & Coyne, J. C., 1990)

#### Parental support

Support of parents is vital to develop a feeling of wellbeing. (Kocayörük, E., Altıntaş, E., & İçbay, M. A., 2015)

#### Risk profiles to develop psychiatric problems

Lower socio-economic status, parents with an addiction or psychiatric disorder and cognitive decline make adolescents vulnerable to develop psychiatric problems (Interview Leontien Los)

#### Stigmatisation

There is a stigmatising (generalised negative) view on psychiatric problems which is hard to break. People are put in the box of their psychiatric disorder and referred to in language ("the autistic, schizo"). (Interview Leontien Los)

#### Early intervention

People get in contact with mental health care when problems are already severe. 60% of the youngsters that come in clinics are already in deep trouble at school. Big problems can be avoided by early intervention. (Interview Leontien Los)

#### Destructive poverty

Debts cause chaotic thinking and a distorted experience of time. Poverty causes stress, is bad for your health and makes less intelligent (living in poverty costs 13 points on IQ) (De Correspondent, 2019)



## 2. 24-Hours Mediated Society

*Continually confronted with Information and communication, but what is to be trusted?*

In the past, space and time were connected. Nowadays, due to the internet, worldwide economy and (digital) money, people can be active at different places and different moments in time. We currently live in a society which is active 24 hours per day; for example (public) transport, (online) shopping and people are always connected by phone. Every moment can easily be captured, shared and spread.

People are visible to the entire world and anonymity has become scarce. Scoops spread in no time and small mistakes can have huge impact. Because information is communicated digitally, the media has a big influence in how people view the world. The evening news channel and newspaper used to be perceived as the truth, but nowadays everyone can be an expert online. This also makes that it is harder to differentiate between big societal impacts and individual lives. A shooting in Utrecht is easily related to the terrorist attacks in France, a flood in Vietnam is put next to a fire in the shopping mall end of the road. The world is getting more connected but that also makes information less trustworthy or superficial.

---

### Context factors

#### Digitally connected through social media

Adolescents now spend 7 hours and 42 minutes per day on social media. The activity and dependency on social media is still increasing. People are more digitally connected and active online. (Wennekers, A. M., D. M. M. van Troost en P. R. Wiegman, 2016)

#### Mediated communication

Media shape how people view the world. Information is communicated through media, and what news is presented is nowadays depending on your personal interests and selected by the presenter of the media itself. (For example the kind of paper or the social medium you're active on). (Giddens, 1991)

#### 24-Hours society

We live in a society that is active 24 hours a day. Shops are always open, (public) transport is always available and the day-night rhythm faded. People are 24/7 reachable by phone (or other medium).

#### Separation of time and space

In the past, space and time were connected. Nowadays, due to globalisation (internet, worldwide economy, and money) can people be active on different places at different moments in time. (Giddens, 1991)

#### Zero privacy

Every moment can easily be captured, shared and spread. People are always visible for the whole world and anonymity has become scarce.

#### Climate change

The consequences of climate change have become more clear. Increased amounts of floods, extreme heat etc. causes the fear that the world might end if we do not change behaviour.



### 3. School as Intense Micro-Society

*High school is an unfiltered and hectic reflection of society*

High school is a hectic place. Adolescence is a life phase in which big physiological, social and psychological changes occur simultaneously. Bodies grow in their final shape, hormones are raging through the body, and emotions are high.

School itself is high in stimuli; receiving a good grade, fighting with teachers, studying hard, get a compliment, looking cool, falling in love etc.

Adolescents (unconsciously) influence each other by mimicking behaviour and that is reflected in that mental issues often rise and fade in phases at school. High school is a society in small, but with highly sensitive and unpredictable individuals that have not developed the filters and balance of adults yet. Adolescence is a critical development transition time, because it is the place and time in which the foundation for life is made: friends, hobbies and a diploma. School is therefore a super intense -but essential- place for positive as well as negative (mental) development.

---

#### Context factors

##### Social pressure to fit in

The number one priority of (most) adolescents is to fit in and be 'liked'. (Interview Adolescents)

##### Bodily and motor development

The body grows into its final shape (length and proportions), gets stronger and increases in coordination. (Nederlands Centrum Jeugdgezondheid, 2015)

##### Mental problems are 'contagious'

Problems resulting from mental issues rise and fade in phases, adolescents (unconsciously) influence each other in developing symptoms. (Interview Jolijn Verduin)

##### Adolescents develop (good and bad) quickly

Adolescents can learn a lot of (bad) things in a very short time. That is why adolescence is the essential period of (mental) development. (Interview Leontien Los)

##### The major importance of school on all levels

The foundation is built at school (friends, hobby's, study). (Interview Leontien Los)



## 4. Role of the School

### *Bringer of knowledge or also preparing for society?*

The school is considered responsible to teach knowledge and prepare students for society (general norms and values). However, it is harder for teachers to give everyone enough attention and the personal connection with students decreases due to bigger school classes and the less schools for special education. This causes that there are more children in class that require extra attention and teachers often miss the tools to handle them.

The role of the teacher has shifted more towards only providing information. While on the contrary, an important role of the school is to signal when they suspect (mental) problems in students too. Together with the increased strictness of the inspection, school cannot offer support to students that miss school hours due to psychiatric problems. We ask from our high school teachers to prepare students for society and intervene and signal in time when students are getting in trouble, but in reality, society forces school to act only role as the provider of knowledge.

---

### Context factors

#### Teacher as bringer of knowledge

The main job of a high school teacher is to convey new knowledge to the children in the classroom. Both providing information and preparing them for society (norms and values) (Interview Niels van den Burg)

#### School signals problems

The role of the school is to signal when problems in students arise (sudden changes in behaviour or results) and contact parents and/or arrange help outside. (Interview Niels van den Burg & Interview Jolijn Verduin)

#### Depersonalisation education

The size of school classes has been increased to 30 students per class. Special schools for adolescents that need extra attention is decreasing. This makes it hard for the teacher to give everyone enough attention and the teacher's personal connection with his or her students is thereby decreased. (Interview Niels van den Burg)

#### Goals for adolescence

Key elements to survive after adolescents are a social network, a school certificate and hobbies. (Interview Leontien Los)

#### Increased strictness of school inspection

The inspection at high schools has become more strict. School can not offer support when students miss school hours due to psychiatric problems. (Interview Leontien Los)

#### Less schools for special education

The amount of specialised schools for children with learning disabilities is decreasing. More children go to a regular school. (Interview Leontien Los & Interview Niels van den Burg)



## 5. On- and Offline Polarisation

*People need the perspective and acceptance of others to reflect on their own ideas*

Adolescents find likeminded people in separated social groups based on their personal interests. They communicate within social groups that are based on interests and get disconnected from people with different opinions. (Social) media support this by showing content based on personal interest. Adolescents are on the search for belonging and when they have trouble to fit in at school, they search for belonging online. It is pleasant to find connection with people who are on the same page, but also causes polarisation and the 'other' to become invisible. Without the perspective of people with different opinions, communication gets distorted. Especially when groups (or society) cannot relate to each other, the ideas become stronger within the group and some can even get isolated from the rest. Online this can result in digital pillarization, extensive gaming or internet usage, or distorted perception of truth. Offline this causes reinforcing social groups with youngsters with the same social skills and background to get together.

### Context factors

#### Second life in the digital world

The activity in online increased, creating a second digital alternative life for example on social media and in games. (Interview Adolescents)

#### Digital pillarization

Adolescents find themselves in separated groups based on their personal interests. They communicate within and about social groups based on interests and get disconnected from people with different opinions. (Social) media support this by showing content based on personal interest. (Interview Adolescents)

#### Reinforced social groups

Adolescents with the same social skills and background often find each other. The ones that already have the skills and language to talk about their problems, and the ones that have problems with it too. (Interview Leontien Los)

#### Lonely youngsters

Young people feel more lonely than before and then elderly people. Research shows that 43% of the youngsters feels lonely at least once a week. (EenVandaag, 2018)



## 6. Closed Eye of Society

*There is a problem, and it's called ignorance*

Research shows that the amount of mental health problems is increasing and develop on an early age. 75% Of the mental health problems develop before the age of 25 and the number of adolescents that suffer from problems is increasing. Approximately 10-20% of the general population will experience at least one episode of depression in their lives, set aside other problems caused by mental health.

Adolescence is the essential period for mental development, but society turns a blind eye. At the moment that adolescents need and want to be taken seriously so bad, their issues are laughed away as something that is part of the life phase. Adolescence is tough, but we seem to have forgotten that. Prevention is lacking, while treatments act in a stage that problems have already become severe. If society is not taking mental health seriously, how can we ask adolescents to post their feelings?

---

### Context factors

#### Adolescence is a critical development transition

The big number and nature of changes (biological, psychological, social) occurring simultaneously during adolescence makes them vulnerable (and this period of life is therefore often called "critical development transition"). (Bois-Reymond, 1995)

#### Early development of mental health problems

75% Of the mental health problems develop before 25 years old and the amount of adolescents suffering from problems is increasing (or at least the amount of reported ones). One in five suffers from sever mental problems. (RTL nieuws, 2018).

#### Increase in students with psychological problems

Huisarts ziet aantal studenten met psychische problemen stijgen: De nood is hoog' (De Volkskrant, 2018)"

#### Parent from educator towards advisor

During adolescence, the role of the parent shifts from educator to advisor. (Dwyer, D. J., & Hecht, J. B., 1992).

#### Problematic depression

Approximately 10–20% of the general population will experience at least one episode of MDD (Major Depression Disorder) during their lives, but even subclinical levels of depression may considerably reduce quality of life and work productivity. (Van de Leemput, I. A., Wichers, M., Cramer, A. O., Borsboom, D., Tuerlinckx, F., Kuppens, P., ... & Derom, C., 2014).

#### 18 Is the deadline (GGZ)

From 16 years old, parents no longer have to decide about the help the adolescent gets. At 18, youth care ends, education is no longer compulsory and adolescents are responsible for their own (payment) debts and contracts. Youth care is part of the municipality and for adults health insurance. (LOC, 2018 & NRC, 2018)

#### Early development of psychiatric problems

Psychiatric issues develop early. Not in the form of a specified DSM illness, but something psychiatric in early youth (12yrs) can develop into different overlapping disorders. (Interview Leontien Los)





## 7. Unique Between the Lines

### *Standing out within your crowd*

In the process of “becoming who I am” the notion of self-identity develops in a process of individuation and separation. On the one hand, being “you” means autonomy, creating your own set of values and taking responsibilities for your actions as an individual. On the other hand, adolescents are sensitive to social reward. Under social pressure to fit in, be liked and separate from what is not “you” is of major importance too. This balance is tested by comparing and mimicking the (people in) their environment they experience what works for them and what does not. Adolescents are finding out where they belong and with who they want to be associated.

---

### Context factors

#### Self-determination Theory (SDT)

Competence, relatedness and autonomy are the three innate needs to allow optimal personal growth and functioning. The intrinsic motivation to reach goals is depending on the satisfaction of these needs. The findings have led to the postulate of three innate psychological needs --competence, autonomy, and relatedness-- which when satisfied yield enhanced self-motivation and mental health and when thwarted lead to diminished motivation and well-being. (Ryan, R. M., & Deci, E. L., 2000)

#### Mirroring surroundings

People compare themselves and mimic (the people in) their environment.

#### Development of self-identity

Adolescents become aware of their own identity and develop this by creating their own values and taking responsibility for their actions (Nederlands Centrum Jeugdgezondheid, 2015)

#### Individuation-separation process

Adolescence is all about “becoming who I am”. This identity development is a process of individuation (identification) and separation. We want to be a part of the bigger picture, but also strive for independence. (Verhaeghe, P., 2012 & Interview Leontien Los)

#### Sensitive to social reward

Adolescents are sensitive to social rewards in the group. The attention shifts towards the peers (Interview Leontien Los)



## 8. Crazy vs Healthy

*They are the crazy ones, not me*

Adolescents' thinking is compartmented; the one friend is for sports, the other for talking, French class is at French and English at English. Something is super amazing or the biggest hell on earth. This adds to the big difference between youngsters in mental health care and those outside. Because of the stigma on psychiatry, those who are in the system do not talk about it, which causes even more speculation of what is happening inside. Those in the mental health care system feel misunderstood. They do not want to appear weak and distant themselves from the 'crazy guys'. 9 Out of the 10 adolescents are prepared to help each other. Adolescents in friend groups support each other when dealing with problems and this helping gives a good feeling. It is not unwillingness, but a lack of knowledge.

---

### Context factors

#### Fear of being weak

Having mental issues is perceived as a sign of weakness. Youngsters do not tend to seek help. (Interview Leontien Los)

#### Helping feels good

91% of the adolescents is prepared to help each other. Adolescents in friend groups support each other when dealing with problems. Helping others gives a good feeling. (Interview Adolescents & MIND)

#### Paradox of growing up in psychiatry

Adolescents in psychiatry are often younger than others emotionally, but have to grow up and become responsible quicker because they are more vulnerable. (Interview Leontien Los)

#### Essential role of parents

A safe growing up environment for children is essential for development. (Interview Leontien Los)

#### Compartmented thinking

Adolescents think compartmented; friends, classes and in and outside doctors office are separated. (Interview Leontien Los)

#### Youngsters want help that fits them

Adolescents in youth care all want help in a way that fits them. This is not the case. The current disorder-based terminology of psychologists does not match with the life-problems that the adolescents experience. (Interview Leontien Los)

#### Psychiatry is stigmatised

There is a big distinction between youngsters in mental health care and without. Those who are not in, have no idea of what happens inside. Psychiatry is stigmatised as non-sexy and boring. Psychiatry is a non-sexy subject



## 9. Makeable Until a Certain Extent

*I owe my dysfunction to myself*

In our neoliberal meritocratic society are people considered responsible for their own failures and successes. Individualism is high at stake, people are individuals in charge of their own actions. The idea prevails that with help of the right technology and treatment, human beings can be shaped both physically and mentally into their ideal self. The knowledge on how to train skills to strengthen identity or basic happiness is growing, basic identity skills and well-being can be taught. Most people learn those skills in their upbringing, but some do not. Society conveys the idea that everyone has the same chances at start, but that seems to not be. 15% Of the people in mental health care cannot recover on their own power and fall back once and again. Mental health development can be supported, but to a certain extent.

### Context factors

#### Responsibility for own actions

People are considered responsible for their own actions, failures and success.

#### The 'makeable' man

The prevailing idea that human beings can be shaped both physically and mentally with the help of technologies, upbringing, education and information.

#### Neoliberal meritocratic society

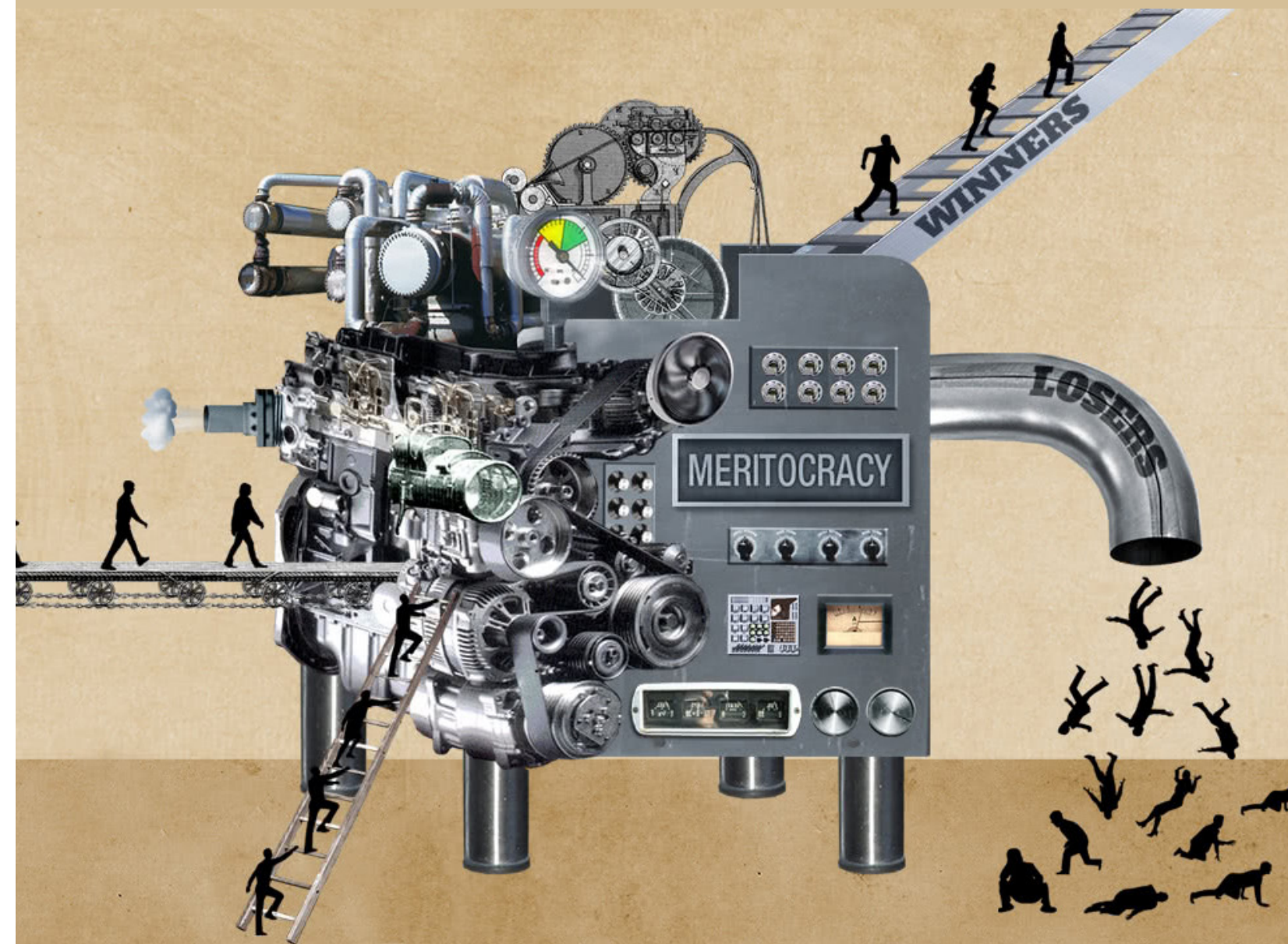
We live in a society in which individuals are rewarded based on their achievements, in which the government has the role of the maker and keeper of the free market to guarantee individual freedom. (Verhaeghe, P., 2012)

#### Mental development skills

The knowledge on how to train skills to strengthen identity or basic happiness can be taught is growing. Most of the people learn that in their upbringing, others do not. (Interview Leontien Los)

#### Need for perspective at general functioning instead of medicalisation

15% of the people in mental health care can not recover on their own power. Do not medicalise, but look at how it goes (school, debts etc.) and use that to get people back to school (Interview Leontien Los)



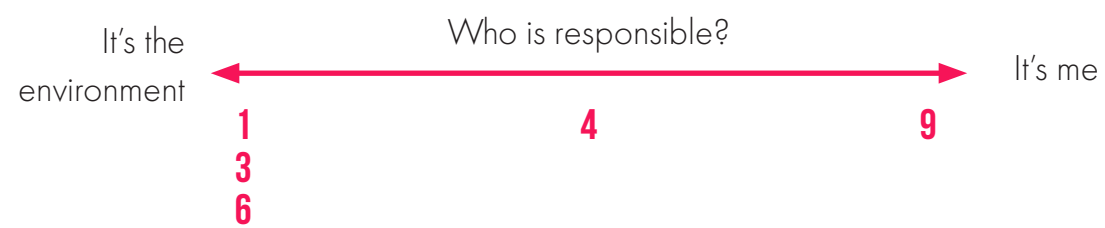
## Framework

The clusters of the previous chapter relate to each other. Some are in conflict, others in line with each other. In order to understand the future world to design for and see where the opportunities lie, I will re-frame the context by creating a framework. By putting the clusters in relation, conflicting forces and polarities within the 'world' of mental development of adolescents come to the surface. Each dimension of the framework corresponds to a different attitude and the two dimensions together show four attitudes an adolescent can have when they struggle mentally. Adolescents move around in this framework, depending on the situation and personality. The framework is used to set apart the different attitudes to respond to struggles and to decide where exactly the design should intervene.

### Dimension 1: 'It's the environment' vs 'It's me'

The opinion about who is responsible for mental problems differs per adolescent and per situation. Getting stuck mentally can be considered the responsibility of the environment or the responsibility of the self. The clusters that suggest that problems of adolescents are the result of outside factors lie at the left side of the axes; their background (1), the school environment (3) and society that fails to pay attention (6). At the opposite side is the opinion that adolescents are responsible themselves. The cluster that man is makeable (9) explains the idea that the source of problems is located in the individual himself and that failure is his own responsibility. The role of the school (4) cluster has difficulties taking position between these two extremes and is placed in the middle of the axes.

By pointing at the environment, the cause of problems is placed outside of the individual; problems happen to them without the belief that they can do something about it themselves. On the other contrary, blaming the self implies that everything can be fixed without help of others. Who to consider responsible greatly influences the attitude towards mental struggles.



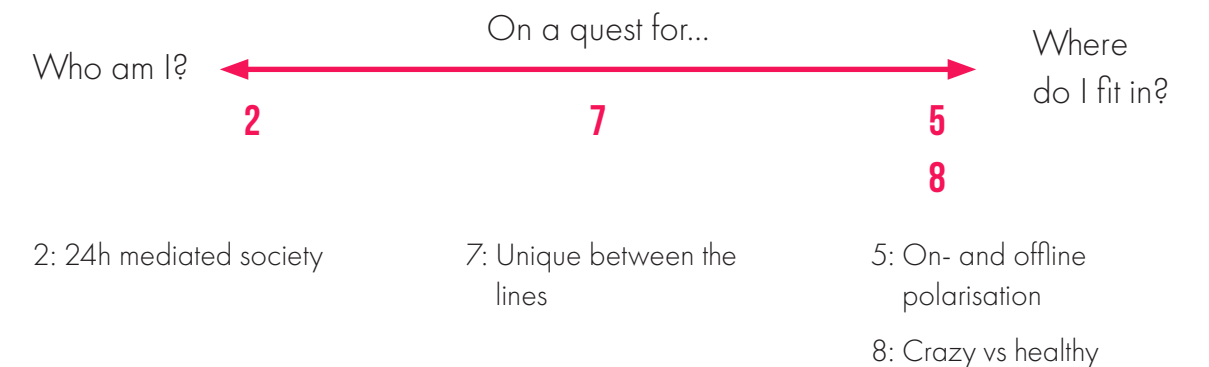
- 1: The cycle of a bad start
- 3: School as intense micro-society
- 6: Closed eye of society

4: Unclear rol of the school

9: Makeable until a certain extent

### Dimension 2: 'Who am I?' vs 'Where do I fit in?'

Adolescence is the time of the development of self-identity. This entails a life phase that is about searching and trying out who you are and where to belong. The left side of the axes represents the quest for who you are, in which adolescents develop their sense of autonomy; the feeling to be in charge of your own life and make your own decisions. Questions about identity; who you are and what your values are, are made increasingly difficult by digital media (2), which forces adolescents to take their position online and find out what and who to believe. At the opposite lies the question of where and how to fit in; which groups to be part of, online as well as offline (5). In combination with the taboo on psychiatric issues, adolescents feel the need to distance themselves from the 'crazy people' (8). Adolescents have a strong need for belonging, to be accepted as a part of a group and play a role in society. This age group especially, jump from the one extreme to the other (7). This constant testing and exploring boundaries is essential to learn how to make choices, take stance in the world and develop a personal identity.



2: 24h mediated society

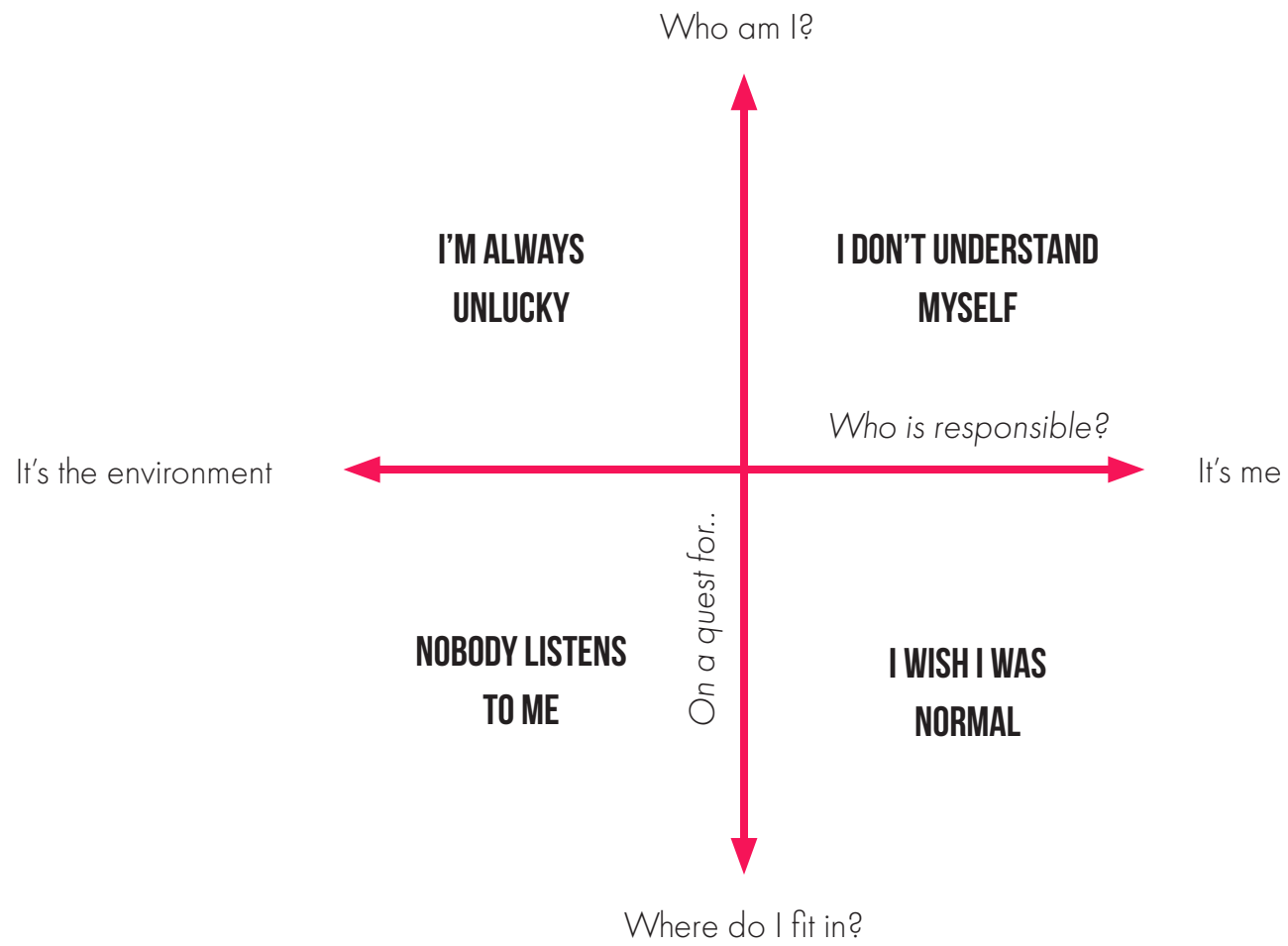
7: Unique between the lines

5: On- and offline polarisation

8: Crazy vs healthy

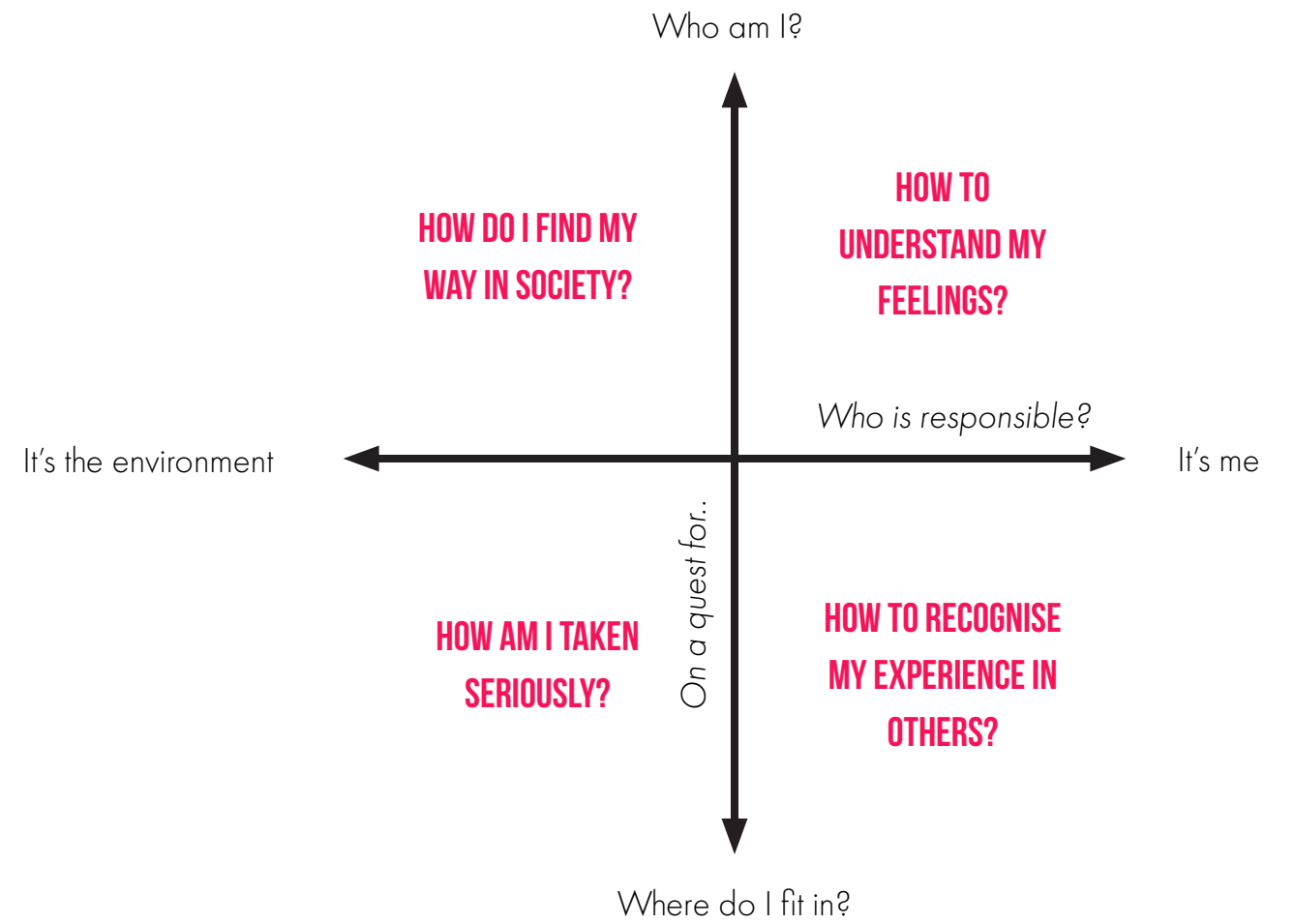
Attitudes

The coherence of the future context is visualised by putting the dimension together in a framework. The four quadrants explain different attitudes towards mental struggles. For example, “I’m always unlucky” is the response attitude to a quest for who you are and holding the environment responsible for your struggles. Each quadrant can be designed for, with its own objectives and interactions.



Coping mechanisms

The coping mechanisms describe directions for improvement in response to each attitude.



### Evaluating framework

In evaluation interviews with experts (Annemarie Karelse; behavioral psychologist, Marion Welling; author of the book “Client Centraal in de Jeugdhulp” and Deborah Reesink and Noa Bar-Eparhim; Diversion) can be concluded that the framework is a coherent and communicable representation of how adolescents can struggle. In the interviews, the importance of the movement on the vertical axes was highlighted. Adolescents jump in extremes on their quest to discover who they are and where they fit in; finding autonomy in connectedness. For example, painting your hair in bright colours or never leaving the house without wearing a hat. As well as fitting in; being part of ‘the cool people’ or finding the ultimate emo-rock crowd you want to belong to online. Trying out these extremes is essential for healthy mental development and learning where your boundaries lie (interview Annemarie). In addition to that, it should be avoided to use labels or make distinctions between adolescents that are in contact with mental health care and those that are not. Other tips from the evaluation interviews were to address a heterogeneous group in order to avoid stigmatisation. In addition to that, beware for negativity; avoid that adolescents drag each other down, for example by adding a moderator or professional to keep an eye on the situation.

## Exploring the Four Quadrants

The context is defined and evaluated, so it is time to explore design opportunities. In this chapter, the framework will be further examined. Effective ingredients for conceptualisation but also as for other designers will be proposed in combination with idea directions.

All four quadrants will be explored for two reasons. Firstly, to be able to make a well-grounded decision to design further on the most fruitful direction. Secondly, to find out which elements of ideas are valuable and effective. These elements form the guidelines for when to design for mental health of adolescence.

The ideas and ingredients follow from reflecting on my own brainstorm sessions, on existing designs (appendix 2) and on a creative session with designers (appendix 8).

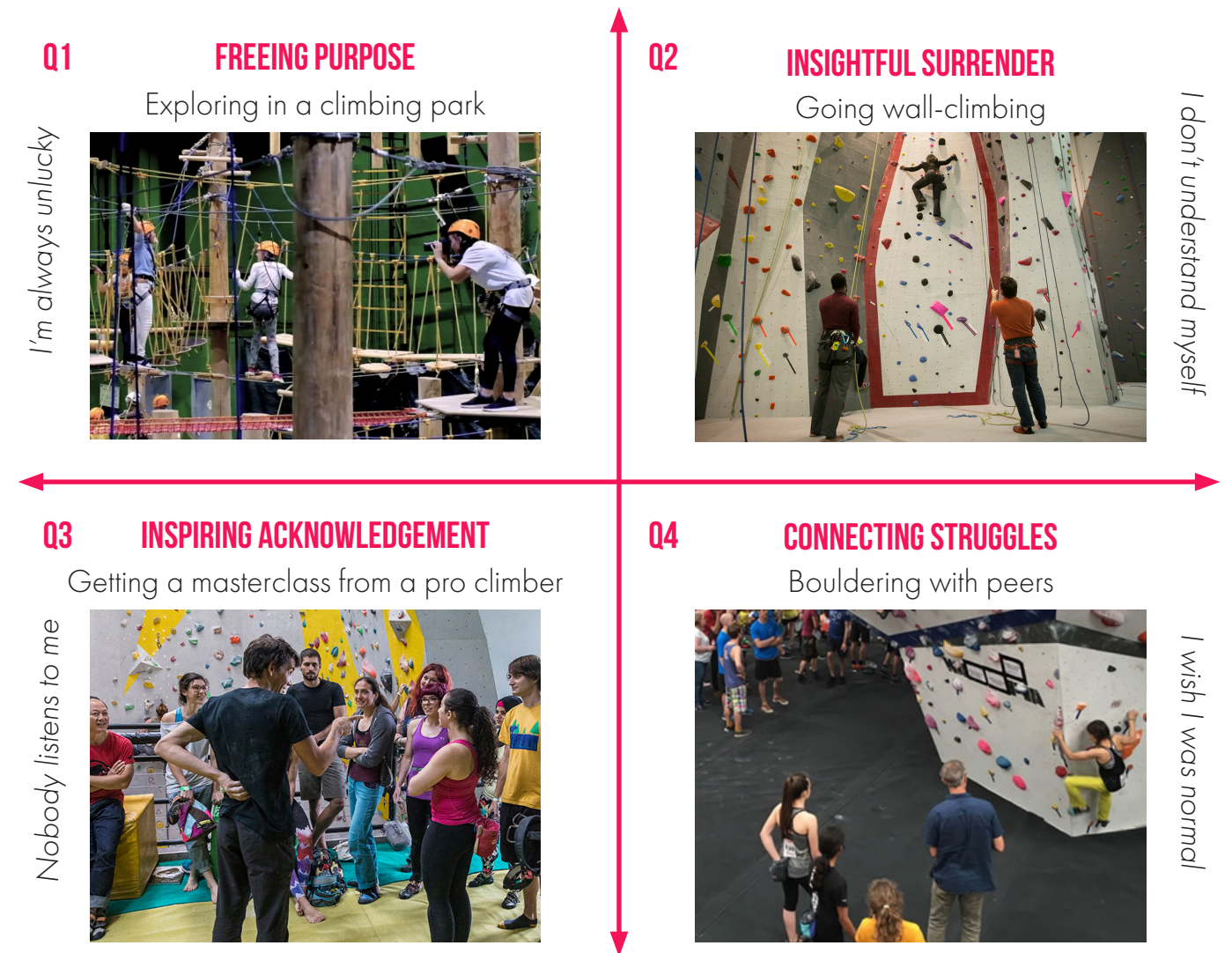


Figure 8: Framework with interaction vision per quadrant

## Q1: I'm always unlucky

*How do I find my way in society?*

### Attitude

Adolescents have the feeling that problems only happen to them and do not feel in charge of their own life. They experience bad luck and do not have trust in the future.

### Statement

I want to seduce adolescents when they miss purpose in their life, to explore what they truly value.

### Interaction vision

“Freeing Purpose”

Like a climbing park; trying different obstacles, on your own level. The one activity pleases you more than the other. Climbing ropes or zip-lining, it's up to you. When it's not your thing, you accept it and choose something else, or force yourself to reach the end at all costs.

### Characteristics

Explorative, free, authentic

### Design Exploration questions

- How to spark curiosity?
- How can you stimulate people to develop themselves?
- How to challenge people to try new things?

### Effective ingredients

#### *Provide freedom with a finish line*

Adolescence is the time to learn to make own choices. However, this goes with trial and error; it is essential to make mistakes or get lost completely sometimes. In this way, adolescents learn to set boundaries and explore these. A bit pressure to develop is needed, but too much force causes resistance. Adolescents need support and direction, but enough freedom to explore.

#### *Trigger intrinsic motivation*

Adolescents can be hard to motivate; many things are considered boring or stupid. Intrinsic motivation or attention is essential in order to learn, change or activate them. This can be triggered by mysteriousness; surprise or randomness intrigues.

#### *Give rewards*

Adolescents are sensitive to rewards. Rewards result in satisfaction, but also seeing that someone else has something that you want can trigger competitiveness and motivation. Rewards can be direct or indirect. For example the fear of missing out entails the reward of being included, being there when it happens is the reward in itself.

### Idea directions

#### *Maakwaar*

Creation is key! Maakwaar is a space where there is everything you want to create whatever you feel like – with your hands-. In Maakwaar, you can make mill, saw and mould anything that comes to mind. As long as it is something YOU feel like making and you take it home when it is finished. Because the chase is better than the catch. There are experts at Maakwaar that support or help you when you get stuck.

#### *Explorehour*

School can be very boring, but what if you decide what to learn yourself? In Explorehour, you get to choose one class in the subject that interests you. The classes are given one afternoon per week during school time and can be from learning Chinese to woodworking. Taking a class is obligatory, but which one is up to you. The classes are taught by enthusiasts of the subject.

## Q2: I don't understand myself

### How to understand my feelings?

#### Statement

I want to help adolescents when they have trouble understanding their feelings, to (re)gain trust in themselves.

#### Interaction vision

“Insightful Surrender”

Like wall-climbing; going your own route, on your own power upwards. Challenging, focuses and fun! It can be scary sometimes, but the safety of the security rope makes it possible to challenge yourself a bit further. In case that you fall, it's not a problem, only a moment to reflect and improve for the next time. At the other side of the security rope, there is someone that catches you if you fall, has a bit more overview and supports you to go on.

#### Characteristics

Supportive, dependent, challenging

#### Design Exploration questions

- How can you learn to understand your feelings?
- How to increase self-confidence?
- How to support people mentally?

#### Effective ingredients

*Put authenticity first*

In finding out who you are and developing a sense of self-identity, adolescents are trying to find their authentic and true self. The opposite, to be “fake”, is consequently a death throw. Authenticity is high at stake with adolescents and they feel a strong need to be taken seriously. Stories and acts are what define “you” and therefore need to be authentic.

#### *Talk and listen without judgment*

In line with authenticity, is listening and talking without judgement. Authentic stories underly recognition and acknowledgment; adolescents can connect with others with the same experience. By listening to peers that went through the same, they learn to accept themselves and feel less alone in their experience.

#### *Provide insight*

Many adolescents lack basic communication skills and knowledge about mental struggles. Questions like: how to talk about feelings, where do emotions come from and how to cope with struggles? There is a big need for explanation and insight. This could be achieved by relating experience or feelings to situations, stimulating personal reflection and by providing information about human behaviour and social relations.

#### *Decrease pressure*

Friends, family, school and society ask a lot from adolescents. Increased pressure from society to perform well adds to sensitivity to develop problems. Easing pressure and helping with or limiting tasks can decrease pressure.

#### Idea directions

##### *Rec. my Patterns*

Track your emotional state throughout the day and link these with what you are doing. This application helps you to get insight in your patterns. After a few weeks, the app suggests if certain factors in your life are related to each other. In this way you get visual representations of the patterns in your life and provide insight in how break problematic patterns or keep the appreciated ones.

##### *My Emotional State*

Take the test and discover your emotional personality and find out why you feel that way. An avatar reflects your current emotional state. The avatar comes with statistics about your state and its strengths and pitfalls. You can use the avatar on your social-media platform or share the test to see the statuses of your friends. Learn to understand and accept your emotions and open up for others.

##### *Brain Bot*

A bot (computer program) that supports mental health in streaming chats (online platforms where you can watch streams of people playing online games, for example Twitch [www.twitch.tv](http://www.twitch.tv) ). Bots are already used to decrease the amount of spam in a chat, for advertisement or simply to make the chat more fun. This Brain Bot responses to the subjects that people talk about; partly with intelligent ‘fun facts’ but also with links to websites with external information about subjects; from brain facts to mental health care support.



## Q3: Nobody listens to me

### *How am I taken seriously?*

#### Statement

I want to encourage (people in) society to acknowledge their experiences of mental development in their own adolescence and share these with the adolescents of today.

#### Interaction vision

“Inspiring Acknowledgement”

Like a masterclass of a climbing pro to a group of young climbers; he inspires them with his personal story, with enthusiasm. He explains about the ‘ups’ and the ‘downs’ but look where he is now! The listeners are at the beginning of a beautiful and exciting journey and listen carefully. In their imagination they go along, feel recognized in their ambitions and inspired to go on.

#### Characteristics

Inspiring, activating, exclusive

#### Design Exploration questions

- How to facilitate mutual understanding?
- How can you inspire people?
- How can you stimulate subversive behaviour?

#### Effective ingredients

##### *Showing the flip-side*

Positivity is the norm, and struggles are hardly expressed. Adolescents feel misunderstood, and their troubles are put aside as ‘part of the life phase’. By expressing vulnerability, the broader picture of a person becomes clear. Showing people in their wholeness makes them more humane. Adolescents then see that that bumps in the road are part of life too.

##### *Emphasise on differences and similarities*

Emphasize not only on recognition and similarities, but also on differences. Seeing that someone else has troubles that are way worse of very different from yours, puts your own things in perspective. Thereby, struggles get normalised.

##### *Provide both passive and active learning*

How adolescents learn or get inspired, differs per person and per situation or mood. Role models, books, museums or movies are examples of more passive inspiration, creating something is an active from. Design should aim for a balance between both.

#### Idea directions

##### *“Throw back 18” campaign*

This campaign confronts society with the struggling time of adolescence. Influencers and Dutch celebrities share their struggles from when they were eighteen. It is a combination of posters and television advertisement to finally acknowledge that adolescence is a difficult time.

##### *“I’ve been there” podcast*

Adults share their experiences of adolescence with the adolescents from now. In this podcast, adults share their stories of how their life was when they were eighteen. These are various stories, but the emphasis is on the wholeness of the story, including both the positive and the negative aspects.

## Q4: I wish I was normal

### *How to recognise my experience in others?*

#### Statement

I want to challenge adolescents at the moment that they get stuck, to get into conversation and find support in each other.

#### Interaction vision

“Connecting Struggles”

Like bouldering together; exploring together, by trial and error. Everyone takes the route of their own level. If you fall, it's visible for others, but they support each other and encourage to go on. Small routes, lots of trying and falling down, but the mat is soft. With equal people around them with the same objectives, they feel connected, safe and challenged to keep learning.

#### Characteristics

Connecting, encouraging, visible

#### Design Exploration questions

How to facilitate connection between people?

How can you make feelings insightful?

#### Effective ingredients

##### *Emphasise on being in the same boat*

Adolescents are all in the same wobbling and turbulent boat of growing up to be adults. By emphasising on this, they invoke shared responsibility to support each other. Opening up can be frightening, but (when safety is guaranteed), everyone dares to be vulnerable to the same extent and that strengthens the entire group.

##### *Connect people*

Social beings as we are, experiencing together binds people. Evoking trust, (physical) contact and connection decreases feelings of loneliness and gives people the opportunity to help each other.

#### *Open emotions*

Positive emotions are the norm, and negativity seems to no longer exist. Break the taboo of emotionlessness. When emotions fill up, adolescents explode or implode and get stuck in themselves. We are all people; everyone feels troubled sometimes and it is time to accept this and open up.

#### Idea directions

##### *Struggle Tinder*

A new version of Tinder does not connect people on appearance, but on struggles! Swipe right if you recognise the struggle, and swipe left if you do not. Three the same struggles? That's a match! The conversation between you and a fellow struggler starts.

##### *Emotive bracelet*

The colour of this IoT-bracelet reflects your emotional state. It connects with an app on your phone which tracks your emotions. Like the mood rings from way back, it is a tool to express yourself and is a conversation starter to talk about how you feel.

##### *The Wailing Wall*

Write your confession, send it to an anonymous website, where people can respond, or you can read other people their confessions.

## Conclusion

The insights from the quadrant exploration that were described form include tools to build upon in conceptualisation. Every concept in the next chapter includes several of the ingredients and are inspired by the idea directions from this chapter. Several of the ingredients underly the ‘Preconditions for Designers’ that is described in the evaluation; these are the preconditions designers need to follow when designing for mental health in adolescence from a PSI-pattern perspective.

Although all four directions brought interesting information, the ideas from quadrant two and four included the most inspiring effective ingredients and creative ideas. For example, the ingredients put *authenticity* first, *show the flipside* and *connect people* influenced the concept development. The same applies to the idea directions of the *Wailing Wall*, *My Emotional State*, *Struggle Tinder* and the *I've been there podcast*. In the next chapter, I decide on the direction to continue with for conceptualisation.



# STATEMENT & INTERACTION VISION

At the end of the conceptualization phase, I will decide on one final concept to design, create and evaluate. In order to do that, the vision statement will be defined, the desired interaction described, and four concepts presented. The creation of the concepts, as well as the decision will be based on the previous research. However, designing is making concessions; you have to decide what to include in the final concept, and what to leave out. Nevertheless, design explorations or ideas that will not be developed further have not been useless. In deciding on the final design direction, insights from the other explorations will be taken into account. When designing something that matters, it is key to have a clear focus and vision; this means knowing what to include, what to leave out and why to do so.

## Positioning

To choose a direction, I look at which direction seems to have the greatest potential to make impact, if there is room for innovation (some might already be core focus of other parties), how suitable it is for design and if it triggers my imagination.

The right side of the framework places the responsibility with the self, which often makes the adolescent the initiator or user of the design. They are struggling with themselves and blame themselves for that. Because the jumping back and forth in their quest for autonomy and belonging, a design that only responds to either one of the two, feels incomplete. It is the combination of learning about themselves and recognising that others go through the same that helps to accept and understand yourself.

In addition to that, a positive change at the right side of the framework, can result in improvements on the left side too. When adolescents understand themselves better (upper right), they consequently feel less abnormal (lower right). If they learn where their feelings come from, how to communicate about them and how to share them with their peers, they also have the ability to communicate their concerns to the community as well as to new generations (lower left). If we teach adolescents about their feelings and the language to talk about them, the taboo fades out and society sees importance to take them seriously. By then, society need to support adolescents that feel unlucky to find their way in society.

## Step-by-step

The vision is explained in figure 9 and starts on the right upper quadrant (“I don’t understand myself”) of the framework and makes its way down (“I wish I was normal”).

It starts when adolescents have trouble to understand their own feelings. They get suddenly angry, sad or gloomy. Many things happen around them and they have trouble grasping and understanding their emotions and experiences. They are in search of themselves and at the same time try to fit in and ‘be normal’.

The adolescent does not want to show or share this struggle. And if he wanted, he does not have the capabilities to do that. The design should therefore give basic knowledge and give the user insight into why he or she feels this way.

In order to do this, the design has to find the right language; understandable, insightful and possible for adolescents to use when talking about their feelings. When mental struggles are accepted as a part of life and adolescents know how to talk about them; they are no longer taboo. With the right language, basic knowledge and insight, the adolescent better understands himself and his feelings.

Then, the adolescent is able to recognise and empathise with his peers about their struggles. If they share the same experience, they can take responsibility and choose to offer each other support. And by helping others, they learn even more about themselves.

As became clear in the interviews, if one adolescent opens up and starts talking about his, her or friends’ struggles, the rest follows quickly. The individual and authentic story should be central, rather than the indication of the problem itself. The design should provide the space to share this story on the one side and open up for acknowledgement and recognition of other adolescents on the other.

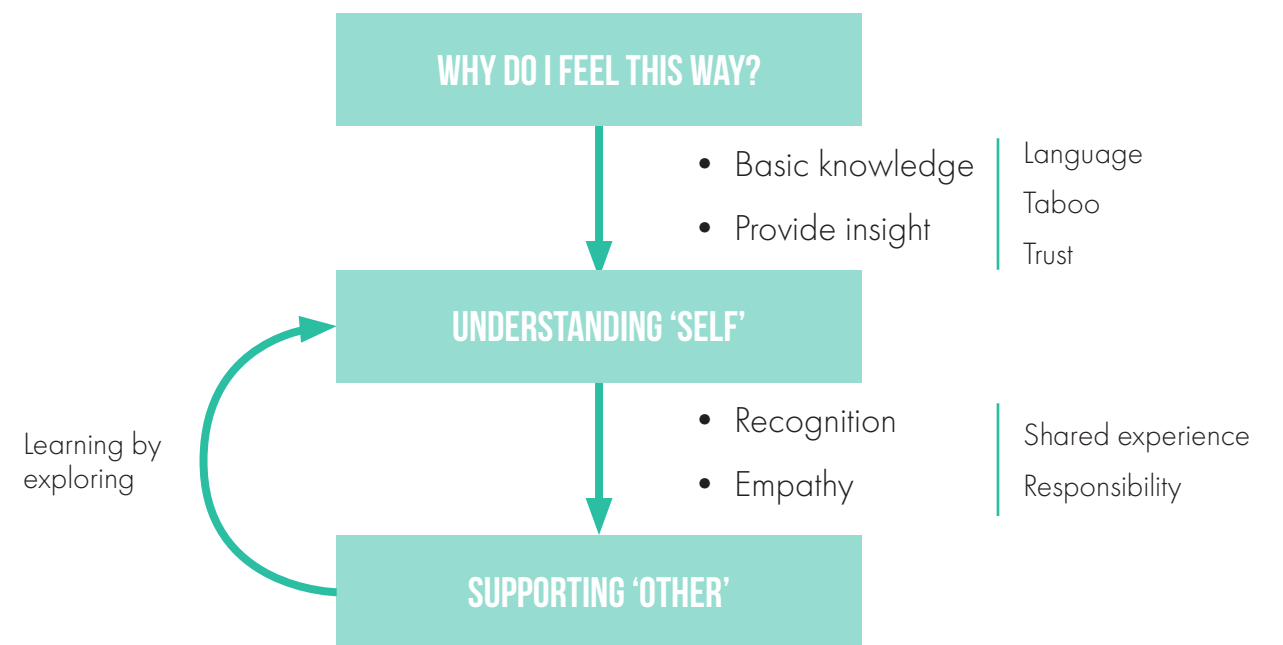


Figure 9: Step-by-step explanation of the design vision

The goal that I want to achieve with my design is...

**I WANT TO TEACH ADOLESCENTS WHEN THEY ARE  
STRUGGLING WITH THEMSELVES, TO UNDERSTAND  
THEIR FEELINGS BY RECOGNISING THEM IN OTHERS.**

## Interaction

This should be experienced as a bouldering hall:

Like in a bouldering hall; you are challenged to learn by trial and error. Try different climbing routes and improve yourself every time. You have to do the climbing by yourself, only you can make you reach the top. But everyone around is climbing too. Sometimes you hear or see someone falling but falling is part of the game! The positive and supportive atmosphere encourages everyone to keep trying, exploring and improving. When you get stuck in a route, or keep falling down, someone can help you from his point of view and experience (“grab the blue one in the corner and put your foot first, that works for me!”). When you are resting, you can look at other climbers, learn their techniques or give some advice when they get stuck too.

### Characteristics

The characteristics of that interaction are that it should be:

#### *Visible*

You are visible when exploring and when struggling. In a safe environment (like the boulder hall), it is okay that others see you struggling, because it is the way to be able to help each other.

#### *Authentic*

It is about you, your life and your explorations. You are the one that is ‘climbing’, finding your way through adolescence. Stories should be honest and genuine.

#### *Provoking*

Being shaken up; the shock when you or someone else fall, the “bang!” on the floor, it is something that triggers. Or when you see someone struggling, it evokes the intrinsic urge to help or catch that person.

## Conclusion

The context of mental health in adolescence is explored and described with clusters. Based on that, the world view was formulated by the use of a framework with attitudes towards mental struggles. The different attitudes towards mental struggles were explored in design opportunities and a decision on the most fruitful direction to design for is made. For that direction, I formulated a vision statement and described how to achieve that goal with an interaction vision.

Next up is conceptualisation. Concepts that teach adolescents that are struggling with themselves, to understand their feelings by recognizing them in others. The concepts bring the information of the context together with the insights from the PSI-pattern analysis in the beginning. Each concept responds in a different way to the statement and incorporates the PSI-perspective in its own way.



# CONCEPTUALISATION

Based on the statement and interaction vision, I design four concepts. All concepts fit the intended vision; however, they differ in how they achieve the goal. Every concept responds to the statement to teach adolescents to understand their feelings by recognising them in others (statement) but have different ways of finding recognition and responding to the PSI-pattern approach. The purpose and functioning of every concept is explained. Also, the relation to PSI-patterns specifically per concept is described and what effective ingredients it incorporates. Finally, the advantages and challenges of the concept are evaluated with adolescents in order to make a well-grounded decision on which concept to further develop at the end of the chapter.

## Recognition mechanism

As the statement implies, the feeling of recognition will be used to make adolescents understand their feelings. Recognition can be achieved in different ways; passively or actively, in friends or in strangers, online or offline, literally or indirectly and also depending on the medium. In order to discover what kind of interaction fits the statement the best, all four concepts use this mechanism of recognition, but in a different way. The concepts will be evaluated and reflected upon what works, what not, and why.

## Relation to PSI-patterns

All concepts presented here reflect the vision of Redesigning Psychiatry, and thereby the philosophy of PSI-patterns. They are no direct tools to draw, break or fix PSI-patterns, but are based on the frame. This is apparent in the use of language; talking about strategies instead of treatments, resilience instead of curing and of course patterns instead of symptoms. In comparison to current mental health interventions, the concepts are focused on prevention and normalising struggles rather than treatment and there is no distinction made between 'crazy' and 'healthy' people.

PSI-patterns consist of problems that occur in interaction, which is the main focus of the concepts as well. These interactions can be within the individual, but also between people and their environment. Problems are a part of life and can form problematic patterns in interactions between factors on individual, social, societal and cultural levels. The concepts add to normalising these mental struggles and breaking the taboo. The story and experience of the person is central, instead of the disorder. The concepts aim to communicate the essence of PSI-patterns in practical design solutions and form a break with the currently used medical model.





## Card game "Connecting Struggles"

This easy card game supports users to have conversations about feelings in a playful way. Play with friends and discover that others experience struggles too!

### Why?

Everyone struggles from time to time, and everyone experiences unpleasant moments. People have more things in common than one might think. These similarities are brought to the table to recognise your experiences in others and open up to talk about these.

### How?

By showing players that they are not alone in their experiences and facilitate a starting point to exchange personal stories.

### What?

A card game with statements about adolescents have experienced -or not-, that in a playful way show the connection. Statements vary in the level of seriousness, some are comical, others ask for introspection. All players that answer "yes" to the question, slap their hands together on a pile in the middle of the table. The recognition can be used as conversation starter.

### PSI-pattern

The topics in the cards are about factors that can cause the development of PSI-patterns. Struggles do not only rise in the individual, but also things that happen in their network. By sharing experiences and different perspectives, the underlying patterns come to the surface.

### Responds to the ingredients

*Emphasize on differences and similarities*

*Connect people*

*Emphasise on being in the same boat*

*Showing the flip-side*



*Get your struggles clear by looking for recognition in your friends'*

## Advantages

### *Fun*

The game is fun to play, which alleviates the pressure of talking about struggles and adds to breaking the taboo.

### *Physical connection*

There is a physical and obvious moment of connection between those that answer “yes” to a question. Hands are slapped on each other on the table. This physical connection adds to the feeling that you are in it together.

### *Open to share the story behind it, but without forcing it*

The user tests showed clearly that sharing an experience triggers to share the story too. It is not obligatory, so the player can still decide to keep his mouth shut. But when one person starts to open up, the rest quickly follows.

## Challenges

### *Effectiveness relies much on the setting*

From the tests with cards could be concluded that the setting is of major importance, as well as the personalities of the people that join the game. When they know each other well, and there is a safe environment, it forms perfect ground to share stories and explore together. However, when the balance is not there, it can become tense and unpleasant. Adolescents are vulnerable, so when they open up, they need to be secured that it is safe.

### *Balance between fun and seriousness*

Players need to be seduced to play the game. Therefore, the balance between fun and seriousness needs to be considered. When the game is too superficial, there is no room for vulnerability and recognition. On the other hand, when it is too serious, they do not feel like playing it anymore.

### *Struggler is the initiator*

Everyone struggles from time to time, but the one that feels troubled, is the probable one to initiate the game. The challenge of this game is to be fun enough to not show this, or the initiation should be from outside (school, parents or that you stumble upon the game by accident).

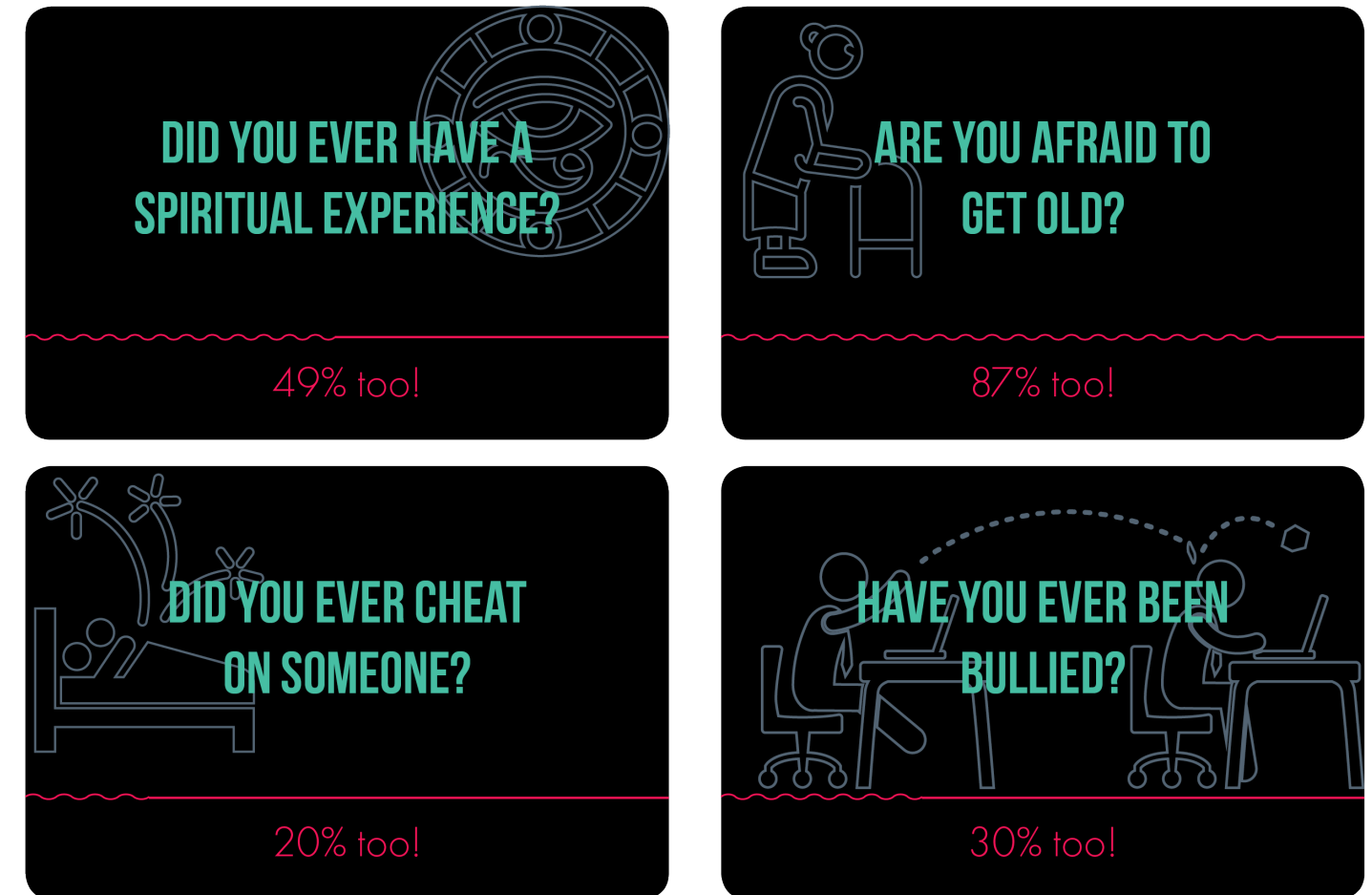


Figure 10: Examples of cards in the "Connecting Struggles" card deck





## Application "Fuck it"

"Fuck it." Is a mobile phone application that teaches adolescents about their negative emotions. It challenges them discover where these emotions come from and why you experience these, in a playful way. Thereby, adolescents understand their own feelings better and recognise behaviour in themselves and their peers. This application provides them with the knowledge and the language to support their peers when they struggle too.

### Why?

Positivity is the norm, but negative emotions are important for well-being too. Why do we feel the way we feel and where do these feelings come from?

### How?

By learning to understand your feelings and find recognition in others. This app aims to break the taboo on negative emotions and learn to vent them with others. It teaches users why they experience a certain negative emotion and where this emotion comes from in a playful way. Sharing and reading stories of others show you that you are not alone.

### What?

By the use of a mobile phone application to grasp when struggling. Small games about negative emotions and that supports the connection with others that experience the same. The games end with statistics about the emotions ("48% feels angry today too") and a wailing wall where users can share their own and read stories of others.

### PSI-pattern

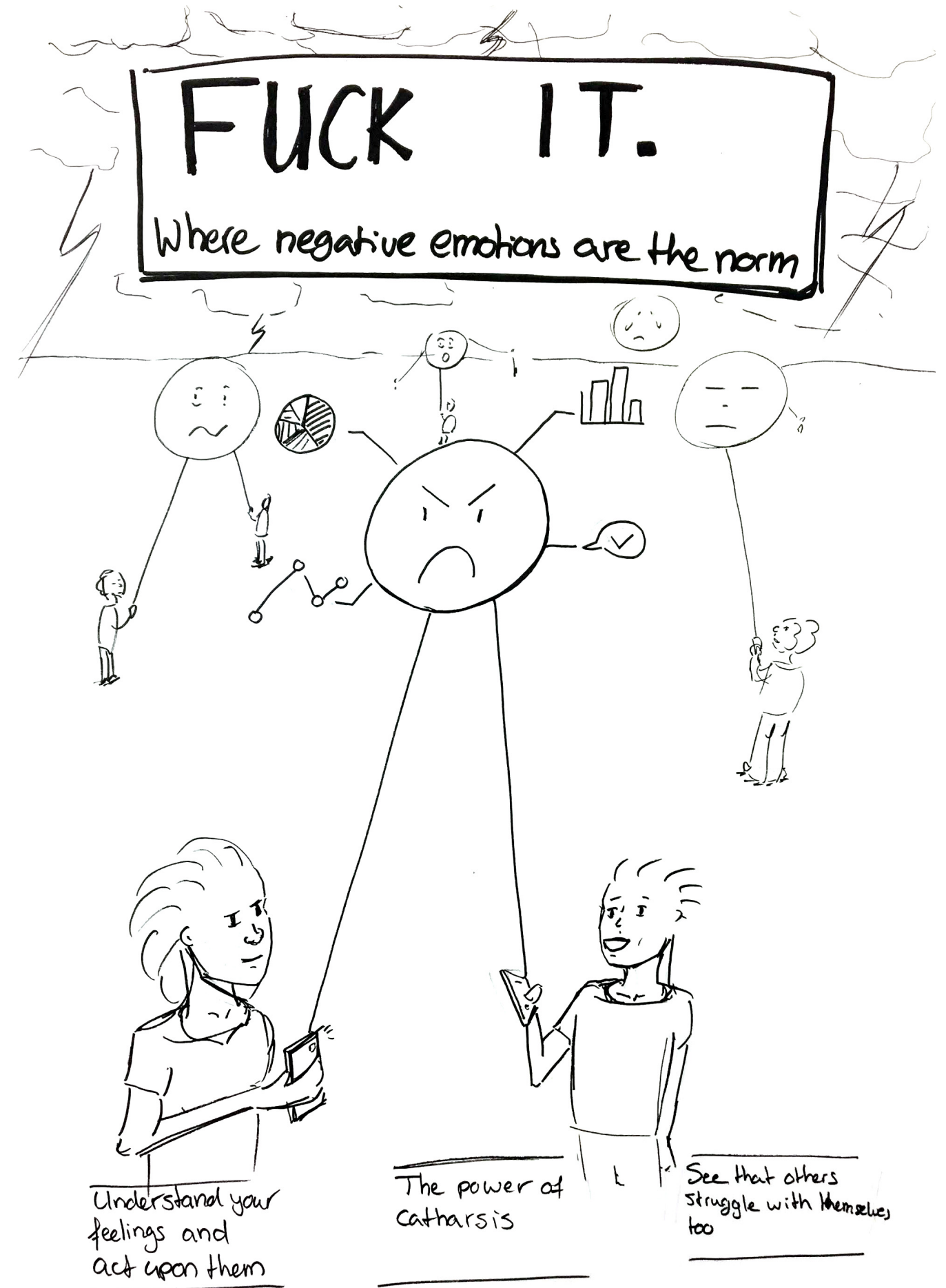
When negative emotions are reoccurring, it can become problematic. This indicates an underlying PSI-pattern. In order to give adolescents insights in where these emotions can come from, the games show a variety of situations in which the emotion can rise. In line with the PSI-pattern approach, these situations are not a result of a direct cause, but can be individual, social as well as environmental. For example, the emotion fear can be a reaction to a direct cause (for example a spider), something social (for example having to give a presentation) or in the self (for example a panic attack).

### Responds to the ingredients

*Open emotions*

*Showing the flip-side*

*Provide both passive and active learning*



## Functioning

A visualisation of how the application could function and look is shown in figure 11. Inspiration for the look and feel came from the collage in appendix 3. The user opens the application when he is struggling with his feelings. The first thing he sees is the home screen, and after hitting the button, a small game starts. The games teach users in a playful way where negative emotions come from and provide the user with statistics about these emotions. After having played with several different situations (in this example, it's the emotion "fear"), the user can check his progress. When he feels like reading or sharing experiences, he presses the text cloud and lands on the share page. Here, the user can find recognition in stories about fear of others, respond to these or share his own story. He can also only respond to a story by indicating if he thinks the story recognizable or strong.

## Advantages

### Catharsis

It gives a good feeling to shout and vent your emotions. After having suppressed them, there is finally a place for emotional ventilation.

### Fitting target group

In comparison to most applications for mental health, this app goes against the soft and 'niceness' of positive psychology. Adolescents often do not desire a soft calming hand, but rather shout and express themselves. In addition to that, adolescents use their phones all day long, which makes an application the obvious medium to reach them.

### Quick

Using the application is very low-threshold, just opening, playing and venting if desired. Learning step-by-step by playing quick games and sharing stories retains lightness.

## Challenges

### Drag each other down

Recognition is an effective tool to make people accept each other, however on the contrary, there is the danger to 'infect' each other. As with pro-anorexia sites, the pitfall is that finding each other in your struggles can flip to the wrong side and drag each other down.

### Define focus

The focus of this app is difficult. On the one hand, the focus might lie on the games, exploring those and learning as much as possible. On the other hand, the sharing at the wailing wall is most interesting to find recognition in others. The challenge is to decide on the focus and find the right balance.



Figure 11: Four screens of the "Fuck it" application



## Podcast "Tell Me How You Fall"

In this podcast, a therapist goes into conversation with an adolescent. Users listen to honest stories that changed adolescent's lives, in their own time. Struggles are a part of life, and everyone has their own life story.

### Why?

With every person, there is more beneath the surface than they show at first sight. Every person has their own life, their own story. Personal stories of adolescents are brought in the open, showing listeners that they are not the only ones that struggle sometimes.

### How?

By listening to real life stories of fellow adolescents that struggle from time to time with themselves, their parents, friends, school etc. Listeners take a moment for themselves and reflect on these stories in their own time.

### What?

A podcast series from therapeutic sessions with a professional (interviewer) and an adolescent.

### PSI-pattern

The factors that cause problems to sustain are put in relation in conversation with the therapist. Thereby, the PSI-pattern in which the adolescent got stuck gets unravelled step-by-step.

### Responds to ingredients

*Put authenticity first*

*Showing the flip-side*

*Emphasise on being in the same boat*

*Provide insight*

# TELL ME HOW YOU FALL

Podcast series on struggles in adolescence



Listen to personal stories of adolescents in your own time

Honest one-to-one therapy sessions, the flipside

No one's life is always hunky-dory

## Pros

### *Place for the entire story*

A podcast is the medium to tell the entire story, from beginning to end. This includes space for all emotions, for the details, the laughs and cries. The story is a thorough, unfiltered, personal and authentic insight in someone's life.

### *Safe and intimate*

Listening in your own time and at your favourite place. It is a safe and intimate action that requires full focus to delve in the story. The podcast is a personal experience between you and the story teller of the podcast.

### *A glimpse inside*

This is the chance to get a glimpse of what is happening "inside". This includes inside psychiatry; how does a therapy session go? But also, the chance to get a glimpse of what is happening in someone else his head. A kind of voyeurism; anonymously observing someone else's life.

## Challenges

### *Quality is highly depending on the interviewer*

The podcast stands or falls with a good interviewer. The challenge here is to design a format for the podcast that has a right balance between direction and freedom for the interviewer. In addition to that, there need to be (ethical) guidelines when talking about mental health with adolescents.

### *Space for response of the listener*

There needs to be space to respond or to converse about the podcast. The challenge is to create or find the platform that support this.

### *Confidentiality*

We are talking with adolescents about sensitive subjects. It is essential that the interviewee is kept safe, and anonymity is guaranteed (or re-enacted by actors).



## Web plug-in "The Bumpy Road"

The web plug-in is an overlay for the browser which shows it when people recognise themselves in elements of human-interest stories. When users read something they experience the same way, they can share this with others or get redirected to comparable stories.

### Why?

Adolescents feel alone in their struggles and search for belonging online.

### How?

By finding recognition in human-interest stories on the internet and seeing that people experienced the same.

### What?

A web plug-in that puts a layer over your browser which allows users to indicate when they recognise something in a human-interest story and view others that do the same.

### PSI-pattern

The development of PSI-patterns in people's life stories comes to the surface. By indicating where struggles lie, it becomes possible to find out where many people 'get stuck' and analyse this information to respond to in the future.

### Responds to the ingredients

*Emphasise on being in the same boat*

*Showing the flip-side*

*Talking and listening without judgment*

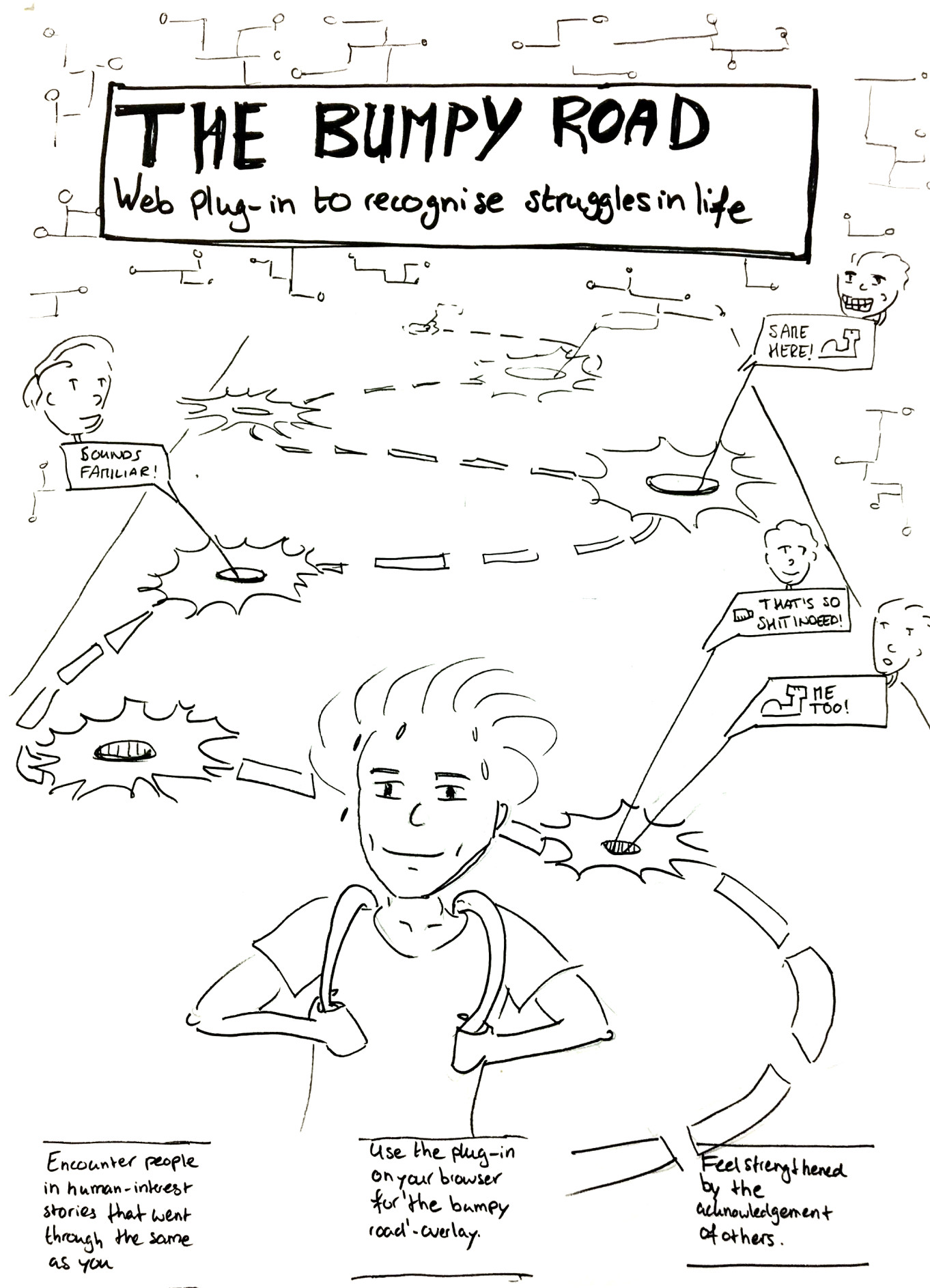
### Pros

#### *Clear recognition*

Recognition is clear, visual and honest. The purpose of the plug-in is recognition and to strengthen each other.

#### *Embedded in existing stories*

No new platform or app is needed, since it uses the content (stories) that are already out there. It creates new links build on existing and honest stories and experiences.



### Challenges

#### What is the right story?

The challenge is to find out what kind of stories are most suitable for design; whether this is for blogs, articles or media social media posts.

#### Relevance for the user

The main challenge is to show why this plug-in is relevant and interesting to use. Finding recognition is key, but that relevance or reward should be clear to the user too.

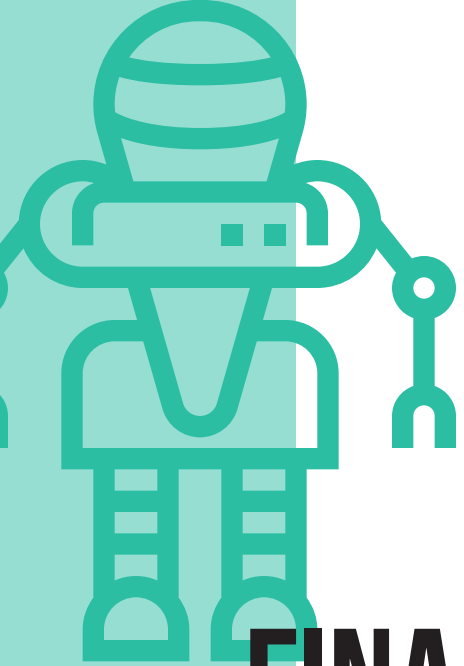
#### Drag each other down

The same as with "Fuck it" concept, there is the danger to drag each other down.

## Concept decision

Every concept covers a different aspect of the vision and all concepts have their pros and cons to develop further. However, decisions have to be made. The "Tell me how you fall" podcast concept will be developed further. There are several reasons for this.

Firstly, the concepts differ in the way and the extent to which they respond to the PSI-pattern approach, but in view of the transition from the medical model to PSI-patterns, this concept is the most interesting. Life stories cover interactions on all domains (from biological to cultural), but also entail the personal experience. The podcast can bring the universal mechanisms to the surface but -because it is built on personal stories- relate to the individual experience and thereby avoid over-generalisation. Secondly, the importance of authenticity came to the surface in the ideation phase, as well as showing the flipside (what is behind the "happy" mask) and providing insight. Sharing stories are the way to respond to these ingredients. A podcast proves to be a very suitable medium for stories. The nuances, the personal and truthful aspects of a story can be communicated. In addition to that, unravelling a story with the help of an expert can be very insightful for the listener. The expert can explicate and operationalise what is happening and why. Next to that, listening to a story is a more personal experience than for example reading; it feels intimate and protected to listen to, but by hearing the voice, you can imagine the person behind the story, with his feelings and depth. The voice is -in comparison to text- inescapable and listening adds to the emotional experience. Emotional experience is in therefore more important than facts, so voice is the ultimate medium. Furthermore, the popularity of podcasts is increasing (CBS News, 2019) and fits with the target group (adolescents) that is digitally oriented. On the preferred time and place, infiltrating in their peers' mind, is a safe and intriguing kind of voyeurism. This concept has the right balance between vulnerability and safety. Finally, the podcast triggers my imagination and personal interest.



# FINAL CONCEPT

## The Bumpy Road podcast

The Bumpy Road is a podcast in which adolescents share personal stories about struggling times in their lives. By listening to the stories, listeners get to peak into someone else's head. The podcast is focused on adolescent listeners and stories cover topics about growing up and getting stuck mentally.

The stories are unravelled in one-to-one interview settings with the adolescent and a pattern expert, for example a therapist with knowledge about how patterns develop and sustain. The adolescent tells about how his struggles developed and how it was experienced. The expert asks clarifying questions to the storyteller to help him unravel the story, including all layers of interaction. Additionally, he operationalises the patterns in the story with explanations and advice directed to the listener. The podcast provides access to personal stories, in order to find recognition, learn something and get advice.

Every podcast takes about 15 to 30 minutes and can be listened to at the preferred time and place. It is a suitable medium for stories; an intimate experience in which the storyteller opens up, shows vulnerability and authentically shares his story. The listener can thereby empathise with the storyteller and use his imagination to create his own version while listening. It emphasises on the things that the adolescents have in common, but also makes clear the differences, show that some things are not even that bad with you. Furthermore, listening to podcasts gives a moment to yourself and is an effective medium for learning.

## Why?

The journey of growing up is a bumpy one. Adolescents develop quickly and there are big changes on physically, socially and psychologically level. In addition to that, their lives are high in stimuli, from digital media or at school. This causes adolescents to struggle with themselves from time to time. There is a taboo on talking about mental health and society turns a blind eye. Adolescents miss basic knowledge and the language to talk about these struggles and feel weird or alone in their experience.

The podcast shows adolescents that they are not alone and to teach them how to cope with their feelings. But also, for those that are curious to see how things works in someone else's head or want to know how to support their peers. Adolescents are often willing to help their friends, but do not know how. The podcast encourages to be shared with friends, to later talk about how others experienced the story and to open up for conversation. Listening to stories is entertaining; a kind of voyeurism, secretly peeking in someone else's life. In addition to that, it gives a moment to themselves, apart from the overload of external stimuli.

This podcast helps adolescents to understand and normalise their own feelings by finding recognition in the problematic patterns of the story tellers and it teaches how to cope with or support their struggling peers.



Take a peek in adolescent's head



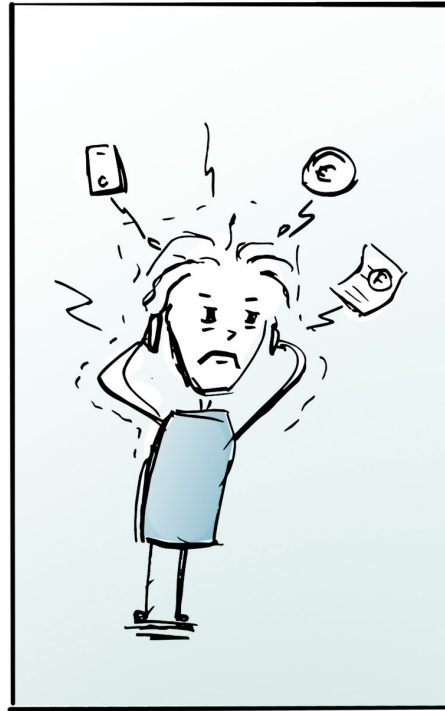
Unravel story in interview setting



Get expert advice

Figure 12: The three elements of the The Bumpy Road concepts

## Scenario



1. Jimmy is overstimulated, he is changing quickly and gets stressed from money issues, social media pressure and school asks a lot from him.



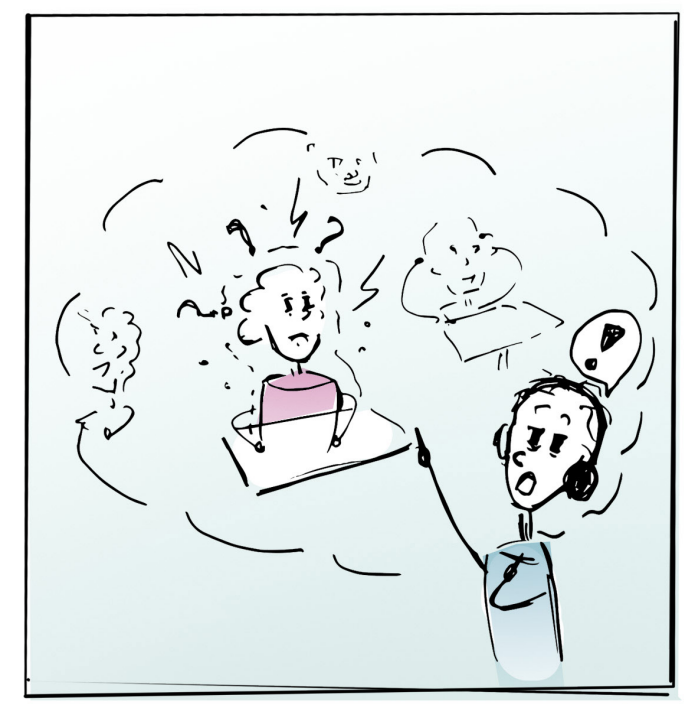
2. He feels alone in these struggles, everyone around him at school seems to be have an easy life and acts happy. This causes Tom to feel even more alone.



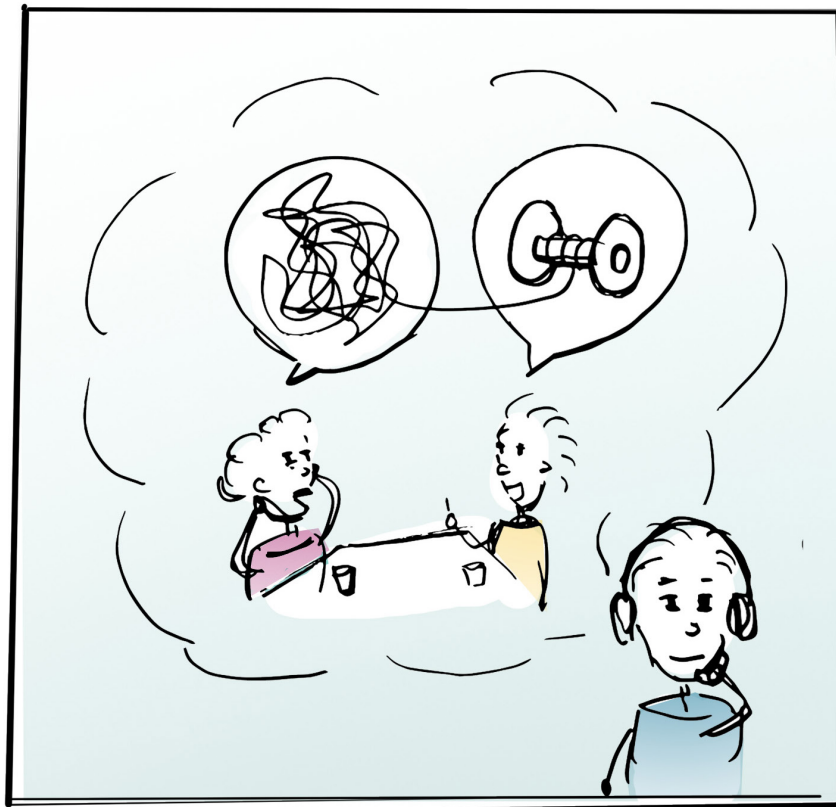
3. He realises that he is struggling and decides to take a moment for himself



4. Jimmy puts on his headphones and listens to The Bumpy Road



5. He recognises his own experience in that of the storyteller in the podcast



6. In a therapeutic-like setting, the story gets unravelled and the mechanisms that sustain his struggles are explained.



7. Jimmy learned that it is normal to struggle, that it is part of life and he now accepts himself better



8. When he sees someone else struggling, he recognises this from the podcast



9. Because of what he learned, he now has the communication abilities to support his peer.

## Podcast

The Bumpy Road podcast experience is the best when putting on headphones and get immersed in the story. Hearing the voice of a peer opening up is an intimate experience; you can hear the emotions in his voice and visualise the story in your own head. It is a thrilling and mysterious experience, which intrigues. The atmosphere starts light, but builds towards a peak, where the core of the story is unravelled. The podcast is dynamic and alternates between light and funny parts, and heavier moments. This balance is important, stories can be heavy but communicated lightly.

Every story is different, but the structure of the podcast repeats itself. It starts with an introducing sentence about what the podcast is about and a jingle. This is followed up in the interview setting where the adolescent introduces himself and starts to tell the story. The story builds up, putting the pieces together one by one. From time to time, the expert explains the situation and experience from an expert perspective. He explains the patterns that can be recognised in the story and operationalises these for the listeners. By jumping back and forth between therapy setting and story, the entire experience is explicated.

### The story

As the title entails, life is a bumpy road. Life is hard, everyone is weird in his own way and everyone struggles from time to time. The bumps in life are the phases that shape people and makes them resilient. Eventually, the podcast platform will cover a variety of stories, varying in themes and intensity. Some are easy and low-key, other cover more serious issues.

The focus of the first few stories that will be recorded are stories of adolescents that struggled with life for a while. There were some bumps in the road, but now they are back on track. These stories of 'ordinary' people that struggle from time to time, are most suitable for listeners to recognise their own experiences. Where people in daily life mostly talk about the positive aspects in life, this podcast gives space to the difficulties. The adolescent reflects on this period with the help of an expert, but the adolescent remains the main figure, he is the expert of his own story.

### Therapist instructions

The choice for a therapist over a (regular) interviewer is for several reasons. Therapists have affinity with mental health and comprehend the language to talk about it. At the same time, they have experience with how far to go into depth while staying within ethical boundaries and securing the safety of the interviewee. In addition to that, part of the therapist's job is to explain the mechanisms that cause problems to reoccur and can give advice from his professional experience.

The therapist is of great importance to the quality of the podcast. Therefore, there are some instructions to help the therapist to unravel the story as intended.

Firstly, the language of the therapist should be in line with the PSI-pattern approach. He talks about patterns, problems and interactions rather than symptoms, disorders and treatments (see figure 13).

Secondly, problems rise in interactions, so the therapist should be sure that the story includes factors on all levels of the pattern. This includes the interactions inside the adolescent, those between the adolescent and others and those between the adolescent and his or her environment (from biological to cultural). All layers of interaction need to be addressed in order to describe the complete story.

Thirdly, systems search for balance, so it should be clear for the listener that the struggles are part of (negative) spirals; of loops of factors that reinforce each other and create problems. The therapist does not look for a cause for the problems but makes the entire problematic system insightful. He or she should support the storyteller in unravelling the complete story.

Fourth, the therapist should avoid making a distinction between healthy and unhealthy people, since the podcast should add to the normalisation of mental struggles. The podcast is targeted at the adolescents that struggle with a certain subject, but also at those that are intrigued by other people's minds.

Fifth, every person has his individual experience and own story, however, there are mechanisms in the behaviour of people that overlap. The therapist explains these mechanisms and clarifies them for the listener so he can use this knowledge for his own life.

WORDS TO USE	WORDS TO AVOID
Pattern	Symptom
Interaction	Disorder
Resilience	Dysfunction
Strategy	Illness
Struggle	Cause
Problem	Curing
Feeling	Treatment
Recovery	
Growth	
Balance	

Figure 13: Examples of words to use and words to avoid for the therapist



## Platform

### Experience

For the platform, we look back at the interaction vision of the bouldering hall. Imagine yourself stepping into the hall and looking around. This is how the platform should be experienced. It is a dynamic environment in which people are climbing routes for themselves. The climbers represent the story tellers in the podcast, and the route can be seen as the story. The people standing on the floor look around, explore the space and view others climbing. They can be just viewing for entertainment, but also to learn from looking at the climber. As the colours of the climbing blocks stand for different levels, the podcast will support different themes across stories. Every route has a variety of colours, and it is for the climber to decide how to get to the top. Climbers can challenge their friends to try new routes or discuss them. The platform supports this free and connecting atmosphere of the bouldering hall by encouraging users to suggest podcasts of their interest to others.

### Episode information and features

The podcast is hosted on a digital platform. On platform, all podcasts can be found, divided on their tags. Users can “like” episodes and share them with their friends. They can make a wish list for episodes to listen to in the future, see which podcasts their friends listened to or give them recommendations.

The title is the “story of [name]”, to add to the feeling of immersing in someone’s life for a short time. It also shows episode tags a visual and a quote. These elements together provide an indication of the ambiance of the podcast (how “bumpy” the story is), as well as a glimpse of the content.

Links to extra inspiration, information and help that corresponds with the content of the podcast can be found in the episode details. These are links to information on websites such as Mind or GGZ, as well as links to for example inspirational TED-talks or movies. In addition to that, there are links to comparable podcasts and there is an e-mail address to mail to if someone wants to share a story too or has any kind of questions or feedback.

To retain confidentiality of the story tellers and keep the environment safe from people with bad intentions, there is no space for response to the podcast itself.

### Episode tags

As stated before, the podcast episodes are categorised by the use of tags. The listener uses these to find the podcast that specifically fits his or her experience, situation or interest. The tags are an indication of the topic, the experiences and the feelings that the listener could relate to. Examples of tags are given in figure 14. In contrast to DSM-V categorisation, these tags are not symptoms or disorders, but subjects that everyone can relate to. There are two types of tags. The first type indicates the topic, the ‘life area’ where the podcast is about. These are judgment free, but also secretly show the themes that people can struggle with. The second type are emotions, these indicate the feelings

that the storyteller in the podcast experiences. As learned from the “Fuck it” concept, adolescents can easily relate to (negative) emotions, so they will easily find the podcast that they can recognize their own feelings in. If someone for example, feels angry, he can choose to listen to a podcast of someone that experiences anger as well. Or when someone has a friend that struggles with love, he can share a podcast about love. The tags are combined with the patterns-tags that will be discussed in the next paragraph ( examples in figure 15 and 16). Together, these tags help the user to find the podcast that fits with his or her emotional state and topic of interest and show what the podcast is about.

The platform itself uses these tags to give suggestions based on the user’s interest. The episode tags are under construction, users can add their own tags and the categorisation can thereby be reviewed and redefined.

THEME	TAG	
Emotions	Faith	Stress
	Loneliness	Gloomy
	Connection	Anxious
	Shame	Misunderstood
	Anger	Perfectionism
	Regret	Insecurity
	Love	Add new...
Life areas	Family	Self-image
	Friends	Sleep
	Stimuli	Belonging
	Sex	Hallucinations
	Drugs	Safety
	Money	Independence
	Gaming	Creativity
	Body	Beauty
	Performance pressure	Pain
	Spiritual	Add new...

Figure 14: Example tags for the episodes

### Sharing is caring

Listening to the podcast is something to do for yourself; a moment without distracting stimuli on your own time, in your preferred place. Diving into someone else's mind is a form of entertainment; like watching Netflix, reading a book, music listening or listening to your favourite radio show (back in the days), it triggers intrinsic motivated and it is intriguing to listen to. The listening "flow" is achieved when there is a balance between fun and learning. On the one hand, the podcast provides information and insight, but it is also amusing to listen to.

The podcast aims to be the conversation starter for the next day. Like sharing which Netflix-series you watch, the podcast is advertised word-to-mouth. People like to share their knowledge, or the fun facts, when they recognize something in a conversation. The podcast responds to the urge to share if you recognize something in what you talked about, or when you see someone else struggling with something.

### PSI-patterns vs DSM

Insights from the research on systems are used for the concept phase. Problems are a part of loops that reinforce (get worse or better) or get a system to stay the same (balancing).

People tell stories, and every story is unique, however, as could be concluded from the research on systems; there are overlapping themes or common occurring mechanisms. In the podcast, the pattern of the adolescent should be unravelled, and the emphasis lies on his personal experience. The expert supports the adolescent in this process, but also operationalises the patterns of the story to the listener. The underlying mechanisms that can be distracted from the story can be explained to the listener in order to make it possible to connect with his or her own experience. In that way, listeners can learn to recognise their own problem sustaining patterns. These pattern sustaining mechanisms are reinforcing or balancing loops that often occur. Examples derived from the addiction and anxiety patterns of chapter "PSI-patterns in adolescence", are for example the cyclic panic pattern; a combination of behaviour, psychological and biological factors that cause problems. This is an example of a pattern that rises in the individual in a short period of time. Poverty on the other hand, is an example of a pattern that rises and sustains across generations, in the family or the neighbourhood. The experience and story around poverty is personal and differs per person, however, the pattern -the mechanism-, is a variation of the general theme of poverty. This distinction is important; the story and experience are personal, but you can understand and accept what is happening if you know that the loop is occurring more often (in different variations). Knowing why you feel a certain way has proven to be a big advantage to the DSM-V diagnostics; people can blame the "disease" instead of themselves. The disadvantage though, is that it can cause the idea that there is nothing to do about it, just the medication or the doctor should solve the problem. The PSI-pattern approach does not emphasise on a disease but places the individual outside of his problematic pattern and focuses on the context. In this approach, the sufferer still sees that it is not his own fault, but it is a natural response to his situation, without losing the realisation that getting out of the problematic situation is going to cost effort.

PATTERN	EXPLANATION
Sleep - weed cycle	The use of weed causes to have trouble to wake up, which decreases the motivation for school, which consequently causes a higher craving for weed.  Operationalised: The use of substances negatively influences sleep quality, which results in a decreased motivation for daily activities (school, work etc.). That lack of purpose and activity in a day increases the craving for substances use.
Panic	When the fear system gets activated by a trigger, this causes bodily sensations (increased heart rate, sweating) which can be interpreted as a threat in itself. Thereby, the fear system gets activated again and this loop causes someone to panic.
Poverty	Money problems cause stress in the household, which consequently decreases motivation for school. The head is busy with the problems at home. This decreases the chances to get a diploma, which is the recipe for money problems in the future.
Lonely isolation	In the case of feeling unhappy or unwell, the most important thing is to keep routine and contact with others. Contradictory, people do not want to seem unhappy or weak and tend to keep distance or even break contacts. This causes the gloominess to get worse and the need for contact to increase even more.
Avoidance	In order to learn that something is not as scary as one might think; it is essential to experience that. In case of anxiety, this is literally facing your fears. In case of social anxiety, it is to experience that someone still loves you even if you make mistakes. The natural response is the opposite; avoidance. Which causes that facing the fear to become even harder.

Figure 15: Examples and explanation of patterns

As suggested at the end chapter the PSI-pattern analysis, which underlying mechanisms and factors there are, needs to be researched. However, a start can be made, and the podcast can help to define them. When there is a great variety of stories, the overlap between patterns come to the surface. The development is dynamic and should go hand in hand with the podcast. Examples of possible patterns are described in figure 15.

## Thom's podcast

These are the steps that need to be taken in order to bring the concept to reality. In this graduation project, the prototype will be developed and evaluated. Further steps of optimisation, realisation and implementation are outside of the scope of the project.

### Develop experienceable prototype

The experienceable prototype simulates the interaction to evaluate if the concept fulfils its intended goal. The prototype consists of an example of an interactive platform and a podcast session. For the session, an adolescent and a psychologist that are willing to participate for the content of the podcast need to be found. Then, the interview between therapist and adolescent will be conducted and sound recorded. After the story is unravelled, decisions need to be made on what to keep and what to leave to get the story across and on which parts are explained in the interview. The therapist speaks to the listeners in order to clarify behaviour, give advice or bind the story together. These three elements -interview, experience and clarification- will be edited together so it forms one coherent story that is interesting to listen to.

### Thom's podcast

The podcast that is created is the story of Thom (fictitious name) in conversation with cognitive behavioural therapist Tonnie Staring. The set-up for the interview can be found in appendix 4. The podcast starts with Thom who explains his story from beginning to end about the gloomy times of high school and beginning of study time. It gets explained further in conversation with Tonnie. Together, they unravel the patterns and how Thom learned to cope with them. Thom's podcast touches upon themes as gloominess, sadness, loneliness, alcohol, self-destruction, shame and social support. The initial session took 120 minutes, some parts were re-recorded, and the total was edited to a 25-minute podcast. Thom's podcast was used for evaluation and for a Redesigning Psychiatry Summerschool workshop on "Thinking in Patterns". After consideration, it was decided to not use Thom's real name, to protect him and his environment from the possible impact of the internet and avoid regrets in the future.

### PSI-patterns in Thom's story

There are several patterns that can be distracted from Thom's story. By gathering these for every story, universal themes or patterns can come to the surface. These patterns are added to and used as the episode tags. See figure 16 for the description.

PATTERN	EXPLANATION
Sleep deprivation	Sleeping problems cause gloominess to maintain. Lack of sleep causes a de-crease in energy level and the sense of perspective. This decreases the degree to which someone can see his thoughts and behaviour objectively. The stress and worrying that this results in makes it harder to fall asleep.
Blurriness	Alcohol can increase feelings of gloominess and makes thoughts blurry. This blurriness decreases the amount of feelings, but also to stay clear in the head.
Self-destruction	Feelings of worthlessness increase the tendency for self-destructive behaviour. Contradictory, this behaviour increases the feeling worthlessness; hating yourself for hurting yourself, having the feeling that you are not worthy of your own sadness.
Social isolation	Isolation causes a distorted perception of what others think of you. The more isolated, the more energy is costs to go outside. Contradictory, social contact often makes people feel better and objectively reflect on their thoughts and behaviour.
Allowing feelings	Not expressing negative feelings and forcing yourself to act happy despite feeling bad, causes that other people respond accordingly. They only give attention to the happy side instead of the person as a whole. This discrepancy does not help to understand or accept the negative feelings and show these even less.
Negative glasses	When feeling gloomy, the information that comes in can be distorted. Only the negative signals come through and the positive ones are overlooked.
Story about yourself	People interpret the world based on the stories they created about the world and themselves, based on experiences in the past. When stories appear no longer sustainable, for example on moments of transition, this can cause a tipping point after which a new balance needs to be created.
Waiting for meaning	Feelings of meaningfulness often come as a result rather than a cause. When someone is feeling detached, he no longer sees the meaning of attaching to goals that used to interest them. Contradictory, even though it does not feel that way, doing something that used to interest you can make the feeling come back too.

Figure 16: Examples and explanation of patterns

Visualisation platform

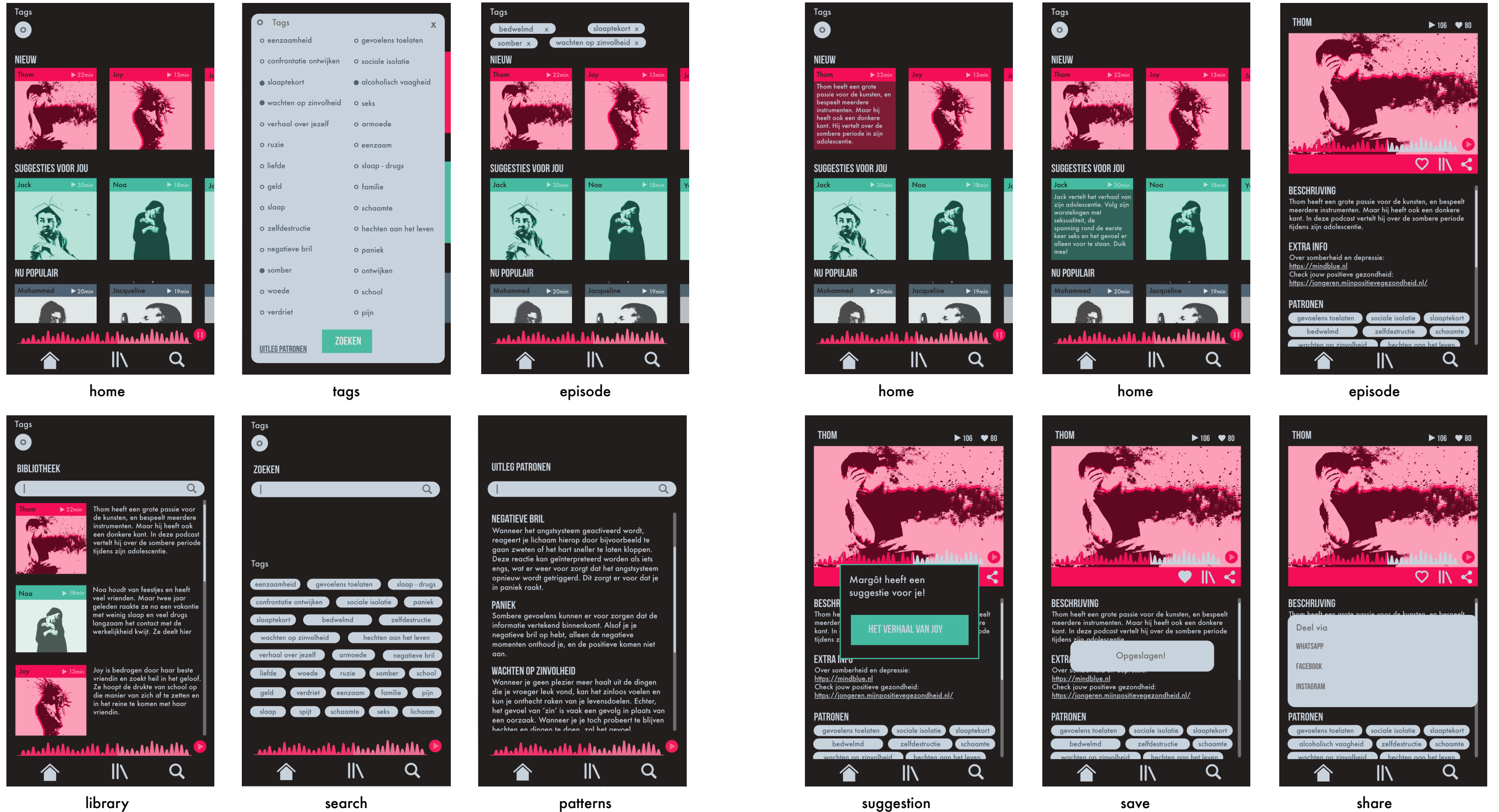


Figure 17: Screenshots from The Bumpy Road digital platform



# EVALUATION

## The Bumpy Road

Thom and Tonnie first listened to the podcast and both agreed on it to be shared. After that, The Bumpy Road was shared with adolescents for evaluation (see appendix 5). There are some conclusions that can be drawn from creating and evaluating The Bumpy Road.

### Project: Research to prototype

It is interesting to see how elements of the research that was conducted are reflected in the content of the podcast. For example how Thom's story touches upon the attitudes that were defined in framework; he explains how he felt misunderstood by his parents when it was put aside as part of the life phase, how he felt lonely and thought that he was alone in his experience while he later heard that his friends were struggling too, and how he struggled with what to do with himself and why he felt the way he felt. In addition, there were multiple patterns that could be distracted from Thom's story. The language of PSI-patterns and putting the emphasis on all interactions on all levels showed to suit the unravelling of the story without losing the expertise of the therapist. By recording new podcasts with different stories, the language can be further defined, as well as the most suitable structure for the conversation and the definition of PSI-patterns.

### Process: interview, editing and recording

There are some things that can be learned from recording and editing the podcast. It was the first time to record a podcast for Thom, Tonnie and myself and it was developed on the go. An inconvenience was that Tonnie lost his voice on the day of the recording, so the pattern explanation parts were re-recorded and edited in later. Listeners indicated though, that he was difficult to hear in some parts. In addition to that, it was the first time for me to edit a sound recording. I listened to many podcasts to learn how podcasts are genuinely structured and taught myself the editing program Adobe Audition. In deciding what to keep and what to leave out, my focus was to get Thom's story across as correct and authentic as possible. There are some editing flaws (a moment in which a voice sounds strange, a background noise or a sudden transition in sentence), but the story was edited from a 120-minute recording to a 25-minute podcast that was balanced and has a logical story line according to listeners.

Furthermore, the idea at first was to use background sounds in order to add to the experience of being in someone else's head. However, this turned out to be very distracting from the story. It could be that in a different way, or that someone with more experience with sound design could turn it into something nice, but voice only suffices for now.

### Form: Podcast build-up

Several conclusions can be drawn from evaluating the shape and structure of the podcast episode. Firstly, the importance of the expert was explicated; someone can recognise himself by hearing the story, but the expert is essential for the reason why you feel that way, and to give direction. The distinction between interview setting and advice should be increased. This could be done by a little longer pause when shifting, a clearer background sound (In addition to that, this one was too ominous), and the explanation directed to the listener in more generalised terms; "What we see in what Thom is telling us...". Furthermore, some difficult words that were used could be reconsidered, for example "manifesteren" and "episode".

Secondly, listeners indicated that the podcast should not exceed 30 minutes and repetition needs to be avoided. In addition, the introduction of who is telling the story and what his hobbies are, was much appreciated.

Thirdly, sharing the podcast or was discussed and did not reach a consensus. On the one hand, listeners said they would share it with friends to help, but on the other hand, it is still a vulnerable subject and they do not want their peers to feel confronted. They said to rather listen to the podcast for themselves, learn from it and use that knowledge to help their peers, or share the podcast in a group (chat), like recommending a documentary.

### Content: Thom's story

Listeners responded very positively on the podcast and underscored how interesting it was to listen to. They pointed out how little you hear honest and real stories like these, and appreciated Thom's kindness and openness. Listeners found recognition in different parts of the podcast. There was recognition in literal elements in the story, for example someone pointed out to have also hurt herself in a very difficult phase during adolescence because she did not know where to go with all the thoughts. Or the realisation of how difficult puberty was and how awful and misunderstood one felt when adults used to say that struggles were just "part of it". Also, the pattern explanations were recognised. For example, the sustainability of your own stories and holding on to them. A listener explained her situation of holding on to the idea of justice for a long time, and how her view on life changed when she realised that in reality the "good" not always wins. Furthermore, listeners realised that they might not be open to recognition of struggles in other people. The podcast helps to recognise if someone is overcompensating or isolating and supports to simply ask how they are doing. A listener said that Thom's story made her realise that there is more behind the mask and decided to try to be kinder to people in general.

## Future

Like most other podcasts, The Bumpy Road is hosted on its own platform. The platform can be found online and shared via external parties as Redesigning Psychiatry or Mind. The episodes can later when the popularity increases, be placed on streaming services as Spotify or other podcast applications. The tags can be used for Google searching terms. Adolescents indicated during evaluation that if they search online for themselves, they would use phrases as, “I don’t know what to do with myself” or “I feel misunderstood”. Interestingly, if they search how to help a friend, they use clinical terms as “depression” or “suicidal thoughts”.

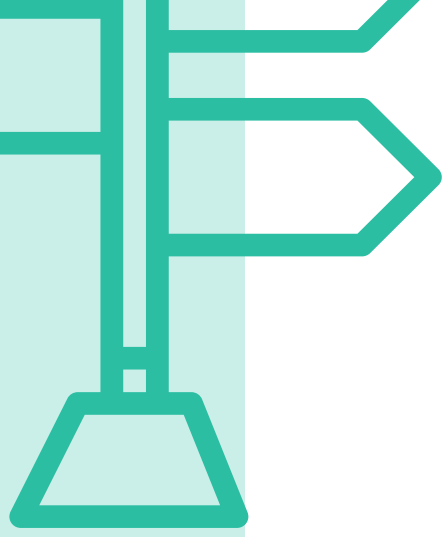
For implementation, the podcast needs a variety of episodes (stories). The topics that should be addressed according to the interviewed adolescents varied from struggling with eating and self-image, to heavier but also intriguing topics as anxiety or schizophrenia. There are organisations such as Mind (<https://wijzijnmind.nl>), Diversion (<https://www.diversion.nl>), Waag (f.e. the makehealth lab (<https://waag.org/nl>)) that -alike Redesigning Psychiatry- aim to improve mental health with new technologies and design. By getting in contact with (one of) these organisations, we get access to adolescents, school classes, experience experts and psychologists that together can team up to develop The Bumpy Road further. By teaming up, we can learn from each other and share our expertise. Also BNN can be an interesting medium to reach adolescents. They have worked together with Mind on programs that aim to break the taboo on mental health (for example television programs “True Selfie” and “Je Suis Depri”). These parties are possible partners for the development of The Bumpy Road.

## Preconditions for Designers

When designing for mental health of adolescence, take into account the following:

1. Secure safety: avoid opening up emotions without supervision.
2. Focus on prevention and normalisation over curing and treatment.
3. Be authentic and truthful.
4. Provide basic knowledge: explain where feelings originate from.
5. Equal talking and listening: pay attention to balance, in bringing people together, ensure that everyone’s participation is equal. Not one person participating much more or less than others.
6. Differences as well as similarities: show differences between adolescents as well as similarities. In the quest for autonomy and belonging, it is essential to find recognition in others, but also to open up for different perspectives or experiences.
7. Facilitate the entire story, be sure to incorporate interactions from micro to macro level, including individual, social and societal factors.
8. Trigger intrinsic motivation instead of imposing solutions. Be sure to make clear what the adolescent gets out of it him or herself. Forcing causes resistance.





# CONCLUSION

In this graduation project, I explored how to use the concept of PSI-patterns for mental development in adolescence. System theory was used to understand behaviour of patterns in ecological systems and the context of mental health of adolescents was explored with the ViP method. This research was used to identify the attitudes that adolescents have towards their mental struggles. I formulated a statement on how to respond to the attitudes and the desired effect to achieve that goal. After iteration, the final concept was defined, developed and evaluated with adolescents.

At first, I attempted to identify and visualize universal PSI-patterns in adolescence. This turned out to be problematic because it is easy to fall into stigmatisation, which is also the biggest pitfall of the diagnostic model (DSM). Nevertheless, several lessons can be learned from the research on system theory for PSI-patterns. Firstly, it was concluded that the focus should lie on the experience and situation rather than looking for a disease. The experience differs per situation and can be considered problematic when problems keep reoccurring or get worse and it is impossible to navigate out of the problematic state. This adds to the second point; PSI-patterns consist of smaller, reinforcing feedback loops of which multiple together cause a problematic state. The loops can cause a situation to get into a negatively spiral. The patterns do not necessarily need to be scientifically proven or detectable, as long as people can recognize and understand them. Furthermore, there is a need for definition in some form. The big advantage of the DSM is that it provides people with a reason for their feelings and PSI-patterns as well should show people that they are not alone in their experience. However, PSI-patterns disconnect the individual from the disease and focuses on the system as a whole. Problems are a result of a toxic system, rather than an individual disorder. By making patterns insightful, people can understand why problems keep occurring and give directions on how to navigate towards a more sustainable situation.

In “Context of Mental Development in Adolescence”, I zoomed in on the context of adolescents. PSI-patterns arise in a combination of interactions within the adolescent, but also between them and their environment. Adolescents develop the notion of “self” in a short time, by looking for belonging

and searching for autonomy. They create the story of who they are by exploring the boundaries. This exploration is essential to grow up as happy and balanced individuals in the future. But at the same time, they and their environment change quickly, and they go through two important transitions; from primary to secondary school and from secondary to study time. Adolescence is the time to develop a social network, enquiring school diplomas and growing up to be adults. It is not possible to pause or fail, because the environment of adolescents develops quickly too. Therefore, if they get stuck or look for professional help, problems have already become severe. Following from this, the attitudes adolescents can have towards their mental struggles were mapped in a framework. The framework describes the worldview of 2022 and helps to shape the design vision.

Adolescents feel abnormal and alone in their experience and lack of knowledge and understanding of mental health to talk about and cope with their struggles. The design needs to break the taboo, normalize struggles and provide explanation. It is required to make patterns insightful. In addition to that, adolescents need to be taken seriously, instead of pushing their troubles aside as ‘part of life’. They need to be really listened to and supported when in need, even before problems get severe. Therefore, the goal of my design is to support adolescents to learn to understand their feelings by recognizing them in others. The design should therefore provide insight in why they struggle and give the language to talk about mental health. That helps to normalise mental struggles and make it easier for adolescents to support each other.

In the design phase, these aforementioned insights are put into practice and reflected upon. The importance of authenticity surfaced, as well as the demand for “real” stories (in comparison to success stories) and the need for advice on mental problems. Therefore, I decided to continue with the design concept of a podcast. A podcast with personal stories can bring the universal patterns to the surface but still relate to the individual experience in order to avoid overgeneralisation. A podcast has proven to be a very suitable medium for stories. The nuances, the personal and truthful aspects of a story can be communicated when listening. Additionally, listening to a story is a more personal experience, it feels intimate and is safe to listen to. By only hearing the voice, the listener uses his imagination to envision the person behind the story, with his feelings and depth. The voice is inescapable and listening adds to the emotional experience. Furthermore, the popularity of podcasts is increasing and fits with the digitally oriented target group. On the preferred time and place, infiltrating in the mind of a peer, is a safe and intriguing kind of voyeurism. Therefore, this concept has the right balance between vulnerability and safety.

The final concept “The Bumpy Road” supports adolescents to learn to understand their feelings by recognizing them in others. Personal and authentic stories about difficult times in adolescence are shared on a platform in different podcasts. In a conversation with a pattern expert, the problematic patterns of the storyteller are unravelled and explained to the listeners. The Bumpy Road teaches adolescent listeners the language to talk about struggles, normalizes them and provides advice on how to help themselves or support others. A prototype episode of The Bumpy Road was recorded and edited, named “Thom’s story”. The episode was evaluated with adolescents, who recognised

themselves or their peers in parts of Thom's story or in the pattern explanations. By recording more episodes in the future, patterns that overlap can be linked between episodes on the platform. This may help to gain a better understanding of the development and sustainability of PSI-patterns, and how to break them.

This graduation project made the concept of PSI-patterns tangible by design for the vulnerable target group of adolescence. The interests of adolescents considering mental problems were mapped and designed for from the PSI-pattern approach. The framework of PSI-patterns is translated from a conceptual level towards a concrete design service. Additionally, this design uses PSI-pattern language in practice to communicate about mental health with the target group. Thereby, the PSI-pattern approach was validated and proven to be a suitable framework for design.

## Future research

The research on PSI-patterns that was conducted in this graduation project opens up to new research directions. Firstly, a qualitative study on stories of adolescents can bring overlapping patterns to the surface. Interventions can then be focused at breaking patterns, from personal to societal level. When certain patterns occur frequent in a specific area, the design interventions should be located there. For example, if many adolescents in a specific school have trouble expressing negative emotions and high levels of social isolation, the design could attempt to change the culture of talking about vulnerabilities in the area, rather than focusing on the problems per individual. Secondly, it should be investigated how the PSI-pattern approach can be supported by a non-stigmatising financial system. Thirdly, therapist protocols need to be developed and tested. This includes which wordings to use and to consciously touch upon all layers of interaction. For example, starting with the person that has a 'problem' and discussing all the interactions; with himself and his thoughts, in his social network, at school, at home, the culture, the life transitions, and all the relations between those. Then invite the people in the system for a second conversation. Unravel with the help of an expert the problematic patterns where they are stuck in and discuss the ways to navigate out of the situation together. Fourth, new design interventions that attempt to break PSI-patterns can be developed, evaluated and reflected upon. Thereby, we keep innovating and bring a positive contribution to psychological well-being in the future.

## Personal reflection

Although graduation can be a bumpy road, it has also been a very exciting and informative one. I will reflect upon what I learned from theory, skills, process and what I could improve in the future.

First of all, I delved into the mental health of adolescents and learned about their development, their vulnerabilities and the struggles they can have. Additionally, I immersed myself in the philosophy of Redesigning Psychiatry and the concept of PSI-patterns. I interviewed inspiring people and read interesting literature that taught me about adolescence, systems, mental health and the Dutch mental health system.

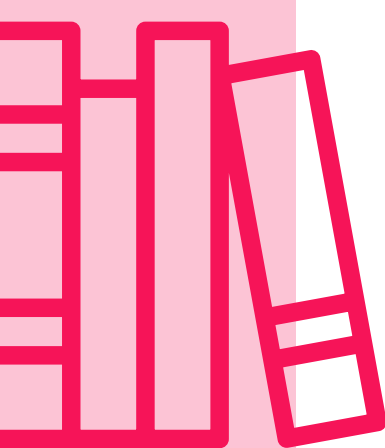
There were also some skills that I practiced. I got to practice my interview skills with multiple very interesting people and learned how to use the ViP-method step-by-step, including Reframing lessons. Additionally, I did multiple presentations, organised a creative session, learned Adobe Audition for podcast editing and Adobe XD for prototyping the platform. Also handling, structuring and communicating a 100-days project while managing expectations and objectives from the TU Delft, the company and myself.

There are improvements that could be made too. The research on PSI-patterns could have been used more in the concept phase. Also, although I decided up-front to spend relatively more time on orientation and analysis than on concept development, the concept could have been developed further. For example, testing different ways to approach the interview and further testing and evaluating the platform. Additionally, I greatly underestimated the psychological impact of listening to stories about mental struggles, especially when listening to it over and over again for the editing. Despite that there was a safe atmosphere during recording and that I am very satisfied with the result, I would therefore not ask a good friend again, but someone I do not know personally.

The process itself taught me some things as well. Most importantly, how to organise and communicate when depending on other people (for interviews, testing, evaluation etc.). I learned how to effectively structure time, be flexible and deal with unpleasant surprises. In addition to this, I have experienced what it is like to work in a company environment and to ask for help when needed. Furthermore, I learned about balancing work and personal life, the importance of separating graduation work from my personal mental health. While at the same time coping with the realisation that study time is ending and that a new life phase starts after this one last individual project. A project which I sometimes saw as my life's work and sometimes as 'just' a 100 days final project. Graduation for me was mainly a phase of personal reflection, which came with moments of nostalgia, pride, fear and determination, but also reframed my desires and ambitions for the future.

In conclusion, it was an amazing opportunity, I enjoyed the road and learned much more than I could have wished for. Furthermore, I hope that this graduation project will positively contribute to the way we view mental health in the future.





# BIBLIOGRAPHY

- Alarcón, R. D. (2016). *Psychiatry and Its Dichotomies*. Retrieved April 3, 2019, from Psychiatric Times website: <https://www.psychiatristimes.com/psychiatry-and-its-dichotomies>
- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders: DSM-5 (5th ed)*. Washington, D.C: American Psychiatric Association.
- American Psychiatry Association (2018). *What Is Psychiatry?* Retrieved April 3, 2019, from <https://www.psychiatry.org/patients-families/what-is-psychiatry>
- Baggerman, D. (2018). *The Universe, Life and Everything*. Retrieved from <http://www.jstor.org/stable/10.2307/j.ctv8pz9v8>
- Blanken, T. F. (2018). *Network Intervention Analysis*. 2.
- Blanken, T. F., Van Der Zweerde, T., Van Straten, A., Van Someren, E. J. W., Borsboom, D., & Lancee, J. (2019). Introducing Network Intervention Analysis to Investigate Sequential, Symptom-Specific Treatment Effects: A Demonstration in Co-Occurring Insomnia and Depression. *Psychotherapy and Psychosomatics*, 88(1), 52–54. <https://doi.org/10.1159/000495045>
- Borsboom, D. (2017). A network theory of mental disorders. *World Psychiatry*, 16(1), 5–13. <https://doi.org/10.1002/wps.20375>
- Borsboom, D., & Cramer, A. O. J. (2013). Network Analysis: An Integrative Approach to the Structure of Psychopathology. *Annual Review of Clinical Psychology*, 9(1), 91–121. <https://doi.org/10.1146/annurev-clinpsy-050212-185608>
- Boumans, J., & Baart, I. (2013). *Het gewone en het bijzondere*. 130.
- Bregman, R. (2013). *Waarom arme mensen domme dingen doen*. Retrieved March 26, 2019, from De Correspondent website: <https://decorrespondent.nl/511/waarom-arme-mensen-domme-dingen-doen/19645395-f6c9a0bd>
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, Mass: Harvard University Press.
- Brown, B. (2011). *The power of vulnerability*. TED. Retrieved from <https://www.youtube.com/watch?v=iCvmsMzIF7o&t=72s>
- CBS News. (2019). *CBS News poll: The jump in popularity in podcasts*. Retrieved June 18, 2019, from <https://www.cbsnews.com/news/cbs-news-poll-the-jump-in-popularity-in-podcasts/>
- Clark, D. M. (1986). *A cognitive model of panic*.
- Davies, W. J. (2016). *The happiness industry: How the government and big business sold us well-being*. London: Verso.
- Dehue, T. (2017). *De depressie-epidemie: Over de plicht het lot in eigen hand te nemen*. Amsterdam: Olympus
- Delft Institute of Positive Design (2019). *Negative Emotion Typology*. Retrieved June 7, 2019, from <https://emotiontypology.com/>
- Derksen, J. (2012). *Bevrijd de psychologie: Uit de greep van de hersenmythe*.
- Desmet, P. M. A. (2019). *Nine Sources of Product Emotion*.
- Desmet, P. M. A., Vastenburger, M. H., Van Bel, D., & Romero, N. (2012). *Development and Application of a Pictorial Mood- Reporting Instrument*.
- Desmet, P. M. A. (2015). *Design for Mood: Twenty Activity-Based Opportunities to Design for Mood Regulation*. 9(2), 19.
- DiSalvo, & La Dantec. (2017). *Civic Design*.
- Dwyer, D. J., & Hecht, J. B. (1992). Minimal parental involvement. *School Community Journal*, 2(2), 53-66.
- Edelson, M. (1990). *Psychoanalysis—A Theory in Crisis*. University of Chicago Press.
- Fava, L., & Morton, J. (2009). Causal modeling of panic disorder theories. *Clinical Psychology Review*, 29(7), 623–637. <https://doi.org/10.1016/j.cpr.2009.08.002>
- Felix, N., Duijst, J., & Captein, M. (2019) *Depressie Onder Jongeren*. NOS. Retrieved June 7, 2019, from <https://app.nos.nl/depressie/index.html>
- Fried, E. I., van Borkulo, C. D., Cramer, A. O. J., Boschloo, L., Schoevers, R. A., & Borsboom, D. (2017). *Mental disorders as networks of problems: A review of recent insights*. *Social Psychiatry and Psychiatric Epidemiology*, 52(1), 1–10. <https://doi.org/10.1007/s00127-016-1319-z>
- GGZ inGeest (2019). *Wat heb ik?* Retrieved June 7, 2019, from <https://www.ggzingeest.nl/wat-heb-ik>
- Giddens, A. (1991). *Modernity and self-identity: Self and society in the late modern age*. Cambridge: Polity Press.
- Goekoop, R. (2012). Hoogleraar met lef. *De Psychiater*.
- Goekoop, R. (2015). *Symposium Netwerken*.

- Government of Alberta CoLab (2016). *Follow the Rabbit: A Field Guide to System Design*.
- Graybiel, A. M. (2008). Habits, Rituals, and the Evaluative Brain. *Annual Review of Neuroscience*, 31(1), 359–387. <https://doi.org/10.1146/annurev.neuro.29.051605.112851>
- Harper, K. (2012). *Catharsis: The purifying aesthetic experience*. Retrieved June 4, 2019, from David Report website: <http://davidreport.com/201202/catharsis-purifying-aesthetic-experience/>
- Hekkert, P., & van Dijk, M. (2011). *Vision in product design: A guidebook for innovators*. Amsterdam: BIS.
- Kendler, K. S. (2008). Explanatory Models for Psychiatric Illness. *American Journal of Psychiatry*, 165(6), 695–702. <https://doi.org/10.1176/appi.ajp.2008.07071061>
- Kenniscentrum Kinder- en Jeugdpsychiatrie. *Jongvolwassenen (Transitiepsychiatrie 18-/18+)*. Retrieved May 7, 2019, from <https://www.kenniscentrum-kjp.nl/professionals/dossiers/jongvolwassenen/>
- Kim, D. H. (1995). *Guidelines for Drawing Causal Loop Diagrams*. 1.
- Kocayörük, E., Altıntaş, E., & Çıbay, M. A. (2015). The perceived parental support, autonomous-self and well-being of adolescents: A cluster-analysis approach. *Journal of Child and Family Studies*, 24(6), 1819-1828.
- Kogel, C. H. (2019). *Breïn in de groei: Over ontwikkeling van het adolescente breïn en gedrag*. Den Haag: Stichting Biowetenschappen en Maatschappij (BWM).
- Levine, P. (2016). *Democracy in the Digital Age*. 10.
- Lovaas, I., Newsom, C., & Hickman, C. (1987). Self-stimulatory behavior and perceptual reinforcement. *Journal of Applied Behavior Analysis*, 20(1), 45–68. <https://doi.org/10.1901/jaba.1987.20-45>
- Manzini, E. (2014). *Making Things Happen: Social Innovation and Design*. *Design Issues*, 30(1), 57–66. [https://doi.org/10.1162/DESI\\_a\\_00248](https://doi.org/10.1162/DESI_a_00248)
- Mooren, F. (2006). *Opvoeding op school en in het gezin*.
- Murray, R., Caulier-Grice, J., & Mulgan, G. (2010). *The open book of social innovation*. 224.
- Nederlands Centrum Jeugdgezondheid. (2015). *Ontwikkelingsaspecten en Omgevingsinteractie*.
- Paquette, D., & Ryan, J. (2001). *Bronfenbrenner's Ecological Systems Theory*. 59.
- Powell, B. (2001). *The Crisis Syndrome: When Archetypes Gang Up*. 14.
- Redesigning Psychiatry (2018). *Samen innoveren voor het psychisch welzijn van toekomstige generaties*. Retrieved April 3, 2019, from [http://www.redesigningpsychiatry.org/wp-content/uploads/RedesigningPsychiatry\\_uitgave2\\_mrt2018.pdf](http://www.redesigningpsychiatry.org/wp-content/uploads/RedesigningPsychiatry_uitgave2_mrt2018.pdf)
- RTL Nieuws (2018). *Bijna één op de vijf jongeren kampt met ernstige mentale klachten*. Retrieved September 2, 2019, from RTL Nieuws website: <https://www.rtlnieuws.nl/lifestyle/gezondheid/artikel/4126406/bijna-eeen-op-de-vijf-jongeren-kampt-met-ernstige-mentale>
- Scheff, T. J. (1979). *Catharsis in Healing, Ritual, and Drama*. University of California Press.
- Sevaldson, B. (2011). *Giga-mapping: visualisation for complexity and systems thinking in design*. 20.
- Steimer, T. (2002). The biology of fear- and anxiety-related behaviors. *Dialogues in Clinical Neuroscience*, 4(3), 19.
- Sterman, J. (2000). *Business dynamics: Systems thinking and modeling for a complex world*. Boston: Irwin/McGraw-Hill.
- Van de Leemput, I. A., Wichers, M., Cramer, A. O. J., Borsboom, D., Tuerlinckx, F., Kuppens, P., & Scheffer, M. (2014). Critical slowing down as early warning for the onset and termination of depression. *Proceedings of the National Academy of Sciences*, 111(1), 87–92. <https://doi.org/10.1073/pnas.1312114110>
- Van Noort. (2018). *Rond Fortnite ontstaat een hele nieuwe sociale werkelijkheid*. Retrieved May 16, 2019, from NRC website: <https://www.nrc.nl/nieuws/2019/05/02/fortnite-is-het-nieuwe-buurtpleintje-a3958818>
- Van Vliet, M. (2019). *Ontwikkeling van de “Mijn positive gezondheid” Jongerentool*. 61.
- Welling, M. (2011). Hulp om bij de les te blijven. *Kwadraad*.
- Wennekers, A. M., Van Troost, D. M. M., & Wiegman, P. R. (2016). *Media\_tijd*.
- Whitaker, R. (2002). *Mad in America: Bad science, bad medicine, and the enduring mistreatment of the mentally ill*. Cambridge, MA: Perseus Pub.
- Damon, W., & Lerner, M. (2008). *Child and Adolescent Development*. John Wiley & Sons, Inc
- Wittenborn, A. K., Rahmandad, H., Rick, J., & Hosseinichimeh, N. (2016). Depression as a systemic syndrome: Mapping the feedback loops of major depressive disorder. *Psychological Medicine*, 46(03), 551–562. <https://doi.org/10.1017/S0033291715002044>

