Designing for responsible practice in introspective design studies

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Summary

Introspective methods are gaining momentum within the design field. They add a subjective dimension to the existing body of research, enriching our understanding of complex phenomena, human experiences, and psychological processes. The personal, revealing nature of introspection is what gives this method its unique opportunities, however, its risks too. Introspection can pose a variety of **risks to the researcher themselves, as well as to those they refer to in their research**. The rise of introspection in design must be met with a corresponding commitment to ethical responsibility. To get there, the gap must be addressed between existing procedural ethics and the realities of introspective practice.

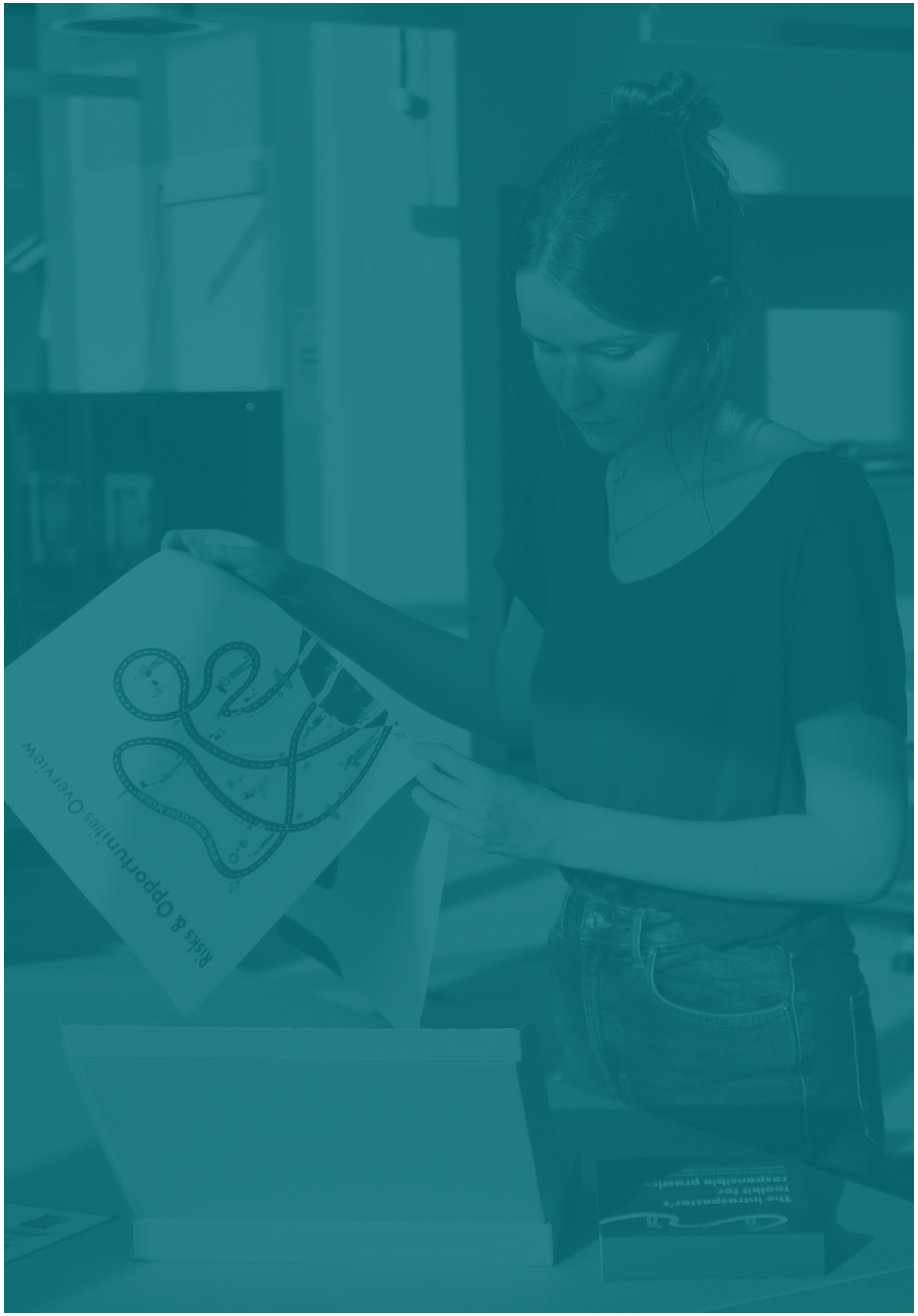
This research journey started with the following ***research question***: "How can we design a tool that supports researchers who use introspection as a method to assess the ethical risks and opportunities of their introspective research and manage these throughout their study?". Through **literature and empirical research**, five risk dimensions and six opportunity categories were defined, providing guiding lenses through which researchers can assess and navigate risks and opportunities (R&O). Through a focus group, interviews, and an introspective self study, three key problems were identified: researchers have little awareness and understanding of potential R&O, it is difficult to look ahead and identify R&O in their own study, and lastly they have little know-how on how to deal with risks (and opportunities). This especially goes for researchers who are new to using introspection as a method.

The following **design goal** was formulated:

To design a tool intended to assist research practitioners engaged in introspective methodologies, in the identification and management of potential risks. This tool would encompass the safety considerations pertaining to themselves and their subjects. Simultaneously, this tool would facilitate the optimization of potential opportunities that introspective study presents, thereby maintaining an effective equilibrium between risk management and opportunity exploitation.

Through **prototyping, testing, and evaluating**, three key ingredients to achieving the design goal emerged: stories for understanding risks and opportunities and their impact; concrete exercises to identify and manage risk in own context; and templates or working sheets that deliver a physical output. A toolkit prototype was created and evaluated with end-users. **Evaluation** showed that the toolkit provides valuable guidance for researcher practitioners to minimize the risks of their study, while maximizing the opportunities. Based on their feedback, a final design update was made, resulting in the final design: **The Introspector's Toolkit for Responsible Practice**. This toolkit aims to help researchers understand, identify and manage the risks and opportunities of their introspective research. The toolkit distinguishes between risks and opportunities within two main areas in the process of introspection: the act of introspection itself, and sharing (e.g. publishing) your introspective account.

Lastly, ten **recommendations** are proposed for further development of the toolkit, including improving its collaborative use, expanding the content, improving form and interaction, and more elaborate testing.



Preface

This thesis marks the end of my graduation project undertaken as part of the MSc Design for Interaction program at Delft University of Technology. Over the course of 100 days, I have poured my enthusiasm and motivation into this project, striving to create something meaningful and impactful.

This report represents not only the conclusion of this project but also the end of my adventure into the Delft world of Design after several years of education in Eindhoven.

This project emerged from a question that arose when working on an earlier project about introspection: Do researcher-introspectors have to sign their own consent form when they are a participant in their own study? This project afforded me the freedom to explore this topic that intersects with many of my long-standing interests, including user experiences, ethics, and introspective research methods. Introspective methods inspire me because of their appreciation for the felt experience. I believe that introspective methods, in combination with design, open up new dimensions with regard to researching experiences. This relates to my motivation for studying Design for Interaction in the first place: I am interested in how people experience things, and how we might change it for the better.

First and foremost, I want to thank my supervisory team, Haian Xue and Pieter Desmet, for your guidance, constructive feedback, and positive encouragement throughout this project. I am grateful that you welcomed me and my idea for this project, and gave me the opportunity and freedom to turn this into a beautiful project. I also want to express my thanks to everyone who participated in the empirical studies and testing sessions, contributing to the development and refinement of this project. To Rob and my family – mom, dad, Kirsten, and Lucas – thank you for your loving support and encouragement. Lastly, I want to thank my friends - Patrick, Marnix, and the rest, you know who you are - who kept my spirits high. Lastly, my friends Kim and Natcho deserve a special thanks, for supporting me throughout this project and foremost for making my time studying in Delft incredibly enjoyable.

This journey has been a collective effort, and I'm very grateful to every one of you who played a part in it.

I hope you enjoy the read and gain some new insights,

-Katelijn

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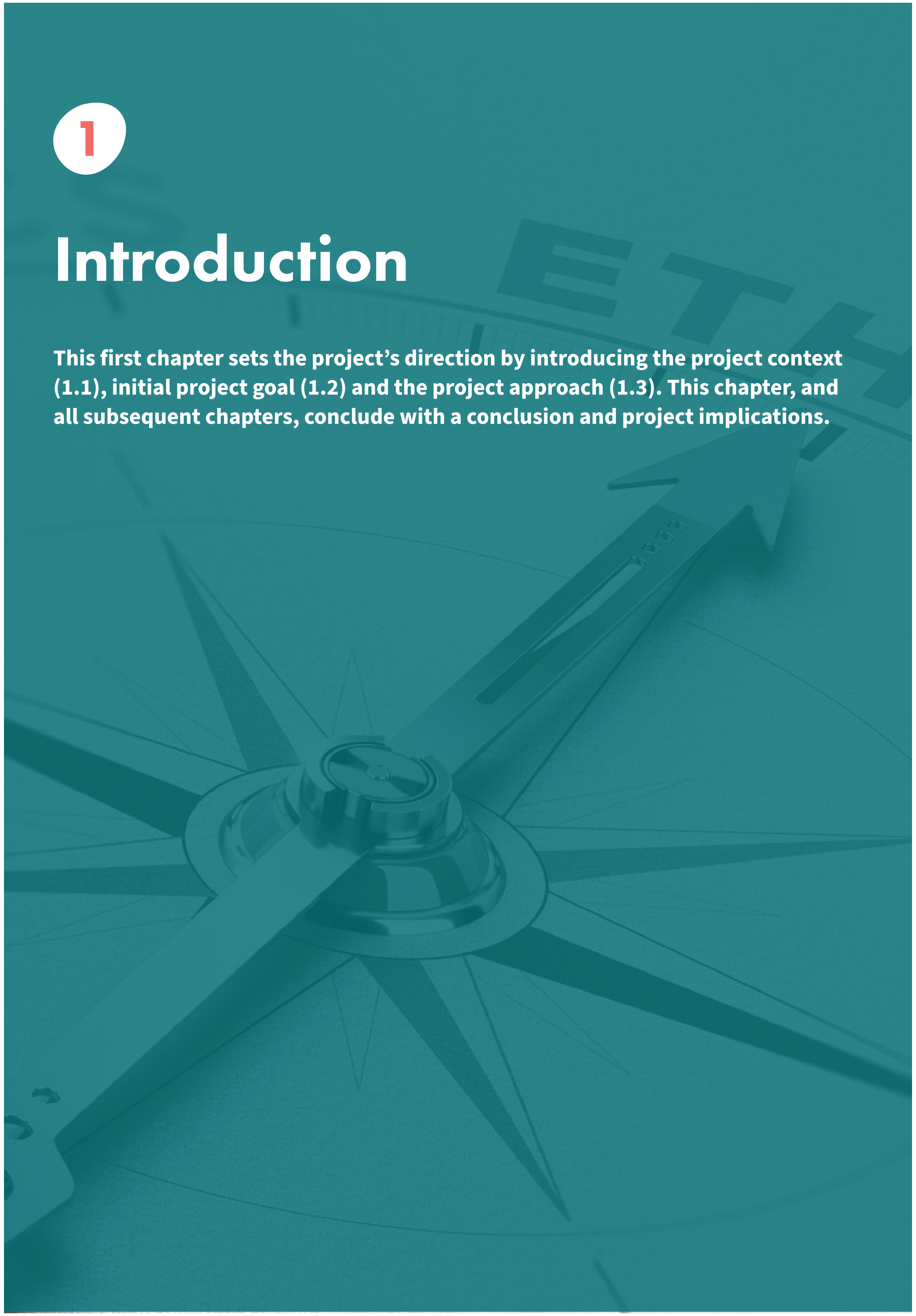


1

Introduction

This first chapter sets the project's direction by introducing the project context (1.1), initial project goal (1.2) and the project approach (1.3). This chapter, and all subsequent chapters, conclude with a conclusion and project implications.

1.1 Project Context

1.1.1 Context

Many studies in the domain of Industrial Design Engineering involve research with 'human research subjects' (meaning, where human participants are (partly) the source of the research data). Nowadays, more and more attention is being paid to ethical underpinning of the research approach that is followed to avoid undue harm those participating in a study. Typical ethical challenges are informed consent, anonymity and confidentiality (Sanjari et al., 2014). Researchers carry a responsibility to take research ethics into account when designing and executing a study, to make sure that participation in a study is voluntary, informed and safe for participants. This usually involves anticipating and minimizing risks, communicating this to participants through informed consent, and managing risks throughout the study.

1.1.2 Introspective methods

However, how does this work when the researcher is the (sole) participant in their own study? Introspective or first-person methods have gained increasing popularity in the field of design, and provide researchers with a powerful approach to investigate their own subjective experiences (Xue & Desmet, 2019). However, this type of method has its challenges. Introspective methods hold that the researcher has a dual role, they are both researcher and researched, i.e. "researcher-introspector" (Gould, 1995; Woodside, 2014). This dual role, along with the revealing nature of introspection, raises certain risks to the researcher. Furthermore, sharing of first-person accounts also raises ethical concerns regarding the potential impact towards closely related people (Helms & Fernaeus, 2021). Personal experiences often involve interactions with others, however, these people may have no say in what is made public.

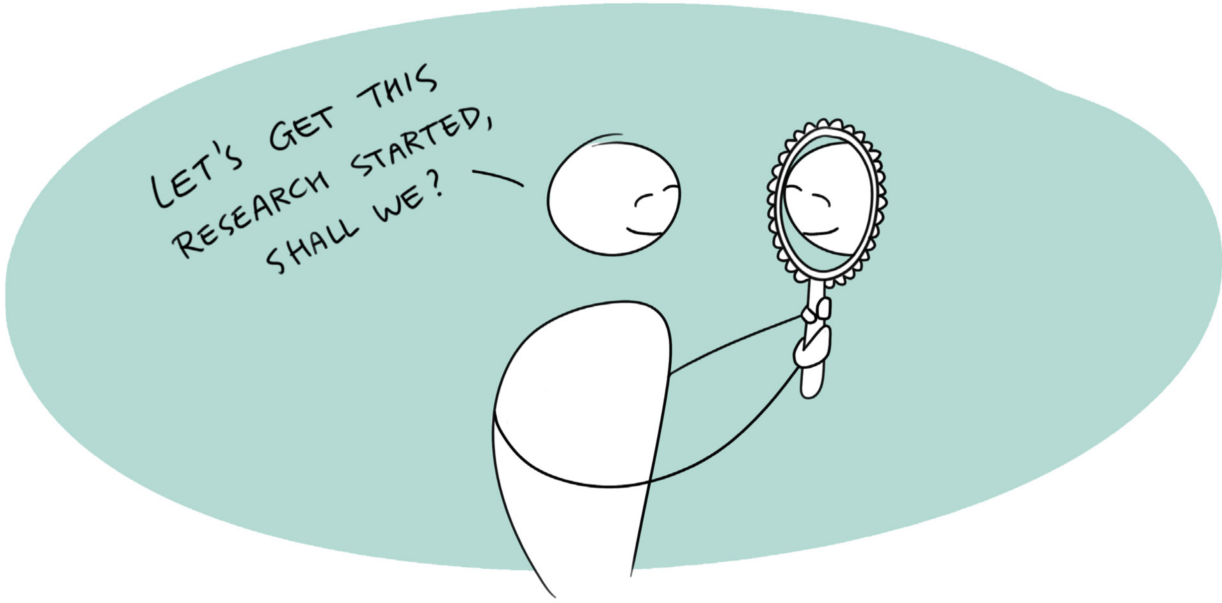


Figure 1.1 | *The researcher is the sole participant in their own study*

1.1.3 Need for additional measures

Typically, institutions like universities provide their researchers with ethical guidelines and codes to help them make the right decisions when designing and executing a study. However, these generalized procedures often times do not account for research in which the researcher is their own participant. Therefore, it provides little help regarding the specific risks that can arise during or after self-introspection. Following the institutional procedures therefore seems more helpful to institutions themselves, as a way of research quality assurance, than it is helpful to introspective researchers in understanding, identifying and managing risks.

Furthermore, introspective methods have been used by researchers who want to avoid ethical approval committees on purpose, e.g. when they want to research a sensitive topic (e.g. anxiety, sex or relations) that is hard to get approval for, or when the study design is burdensome to the participant. Ethical committees won't approve researching 'external' research participants when studies are deemed too risky, but codes or guides around researching yourself are often blurry or non-existent. This is illustrated by Brueggeman et al. (2018), who present a disruptive research project on *licking* objects in public spaces as a method for thinking with, designing for, and interfacing through taste. They argue their research endeavour would pose too large risks to external participants, and therefore, they should test on themselves.

> ***"Moreover, it was impractical for us to get ethical approval for any Lickable Cities studies involving other people. We could not guarantee their health and safety; we could only consent to risking our own"***
>
> (Brueggemann et al., 2018, p.4)

Researchers may (arguably) study themselves under more burdensome circumstances than they might study others, however, studying yourself is not without risk. It is important that researchers who want to do introspection have the means to deliberately consider these risks and harms, as well as the impact on themselves and those they represent in their study. Currently, however, no practical guidance on responsible research for introspective designers is available.

1.1.4 Relevance and Scope

There is an urgency to make measures available that address the need described above, because introspective methods are growing in popularity within the design field, but more attention needs to be paid to the ethical risks. Researchers should have the means to protect themselves and others from potential risks of introspective studies, and this should be central to the research design.

1.2 Initial project goal

1.2.1 Goal

The goal of this project is to design a tool that supports researcher-introspectors to consider potential risks and opportunities in their study. It is important that researchers have the means to set up and carry out their introspective research in a responsible way, including consideration of risks to self and others.

1.2.2 Research Question

The following research question was formulated to guide the start of this design project.

> *"How can we design a tool that supports researchers who use introspection as a method to assess the ethical risks and opportunities of their introspective research and manage these throughout their study?"*

This project aims answer the research question above by providing new insight into the main ethical risks of researcher-introspection, how researchers experience this, what they need in order to deal with risks, how they can balance it with the opportunities of their study, and how a tool could be designed that supports researchers to perform their research in a responsible way.

Figure 1.2 | *Encountering both opportunities and risks on your research journey*

1.3 Project Approach

In this project, the double diamond framework is used as a guideline, while tailoring it to the specific needs of my project. While the traditional framework consists of distinct phases of Explore, Focus, Design and Deliver, I adapted the dimensions of the diamonds to place a particular emphasis on the research phase, as is visualized in Figure 1.3. Additionally, a flexible and non-linear approach is embraced, allowing for experimentation and adjustments throughout the process.

This project is approached by combining knowledge and insights gained from literature research and empirical research. Based on the synthesized insights, the project is then reframed towards a relevant problem and design goal. Through different design explorations, a final concept is developed. This concept is then prototyped and evaluated by different stakeholders. The evaluation outcome is used to make a design update, resulting in the final design and recommendations.

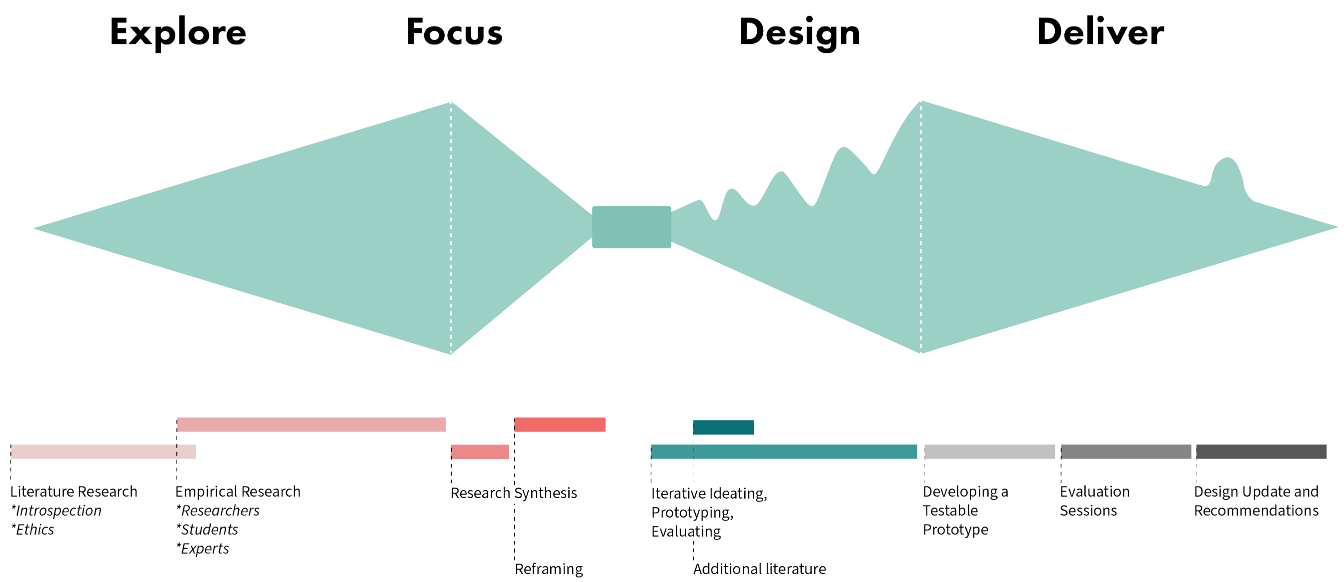


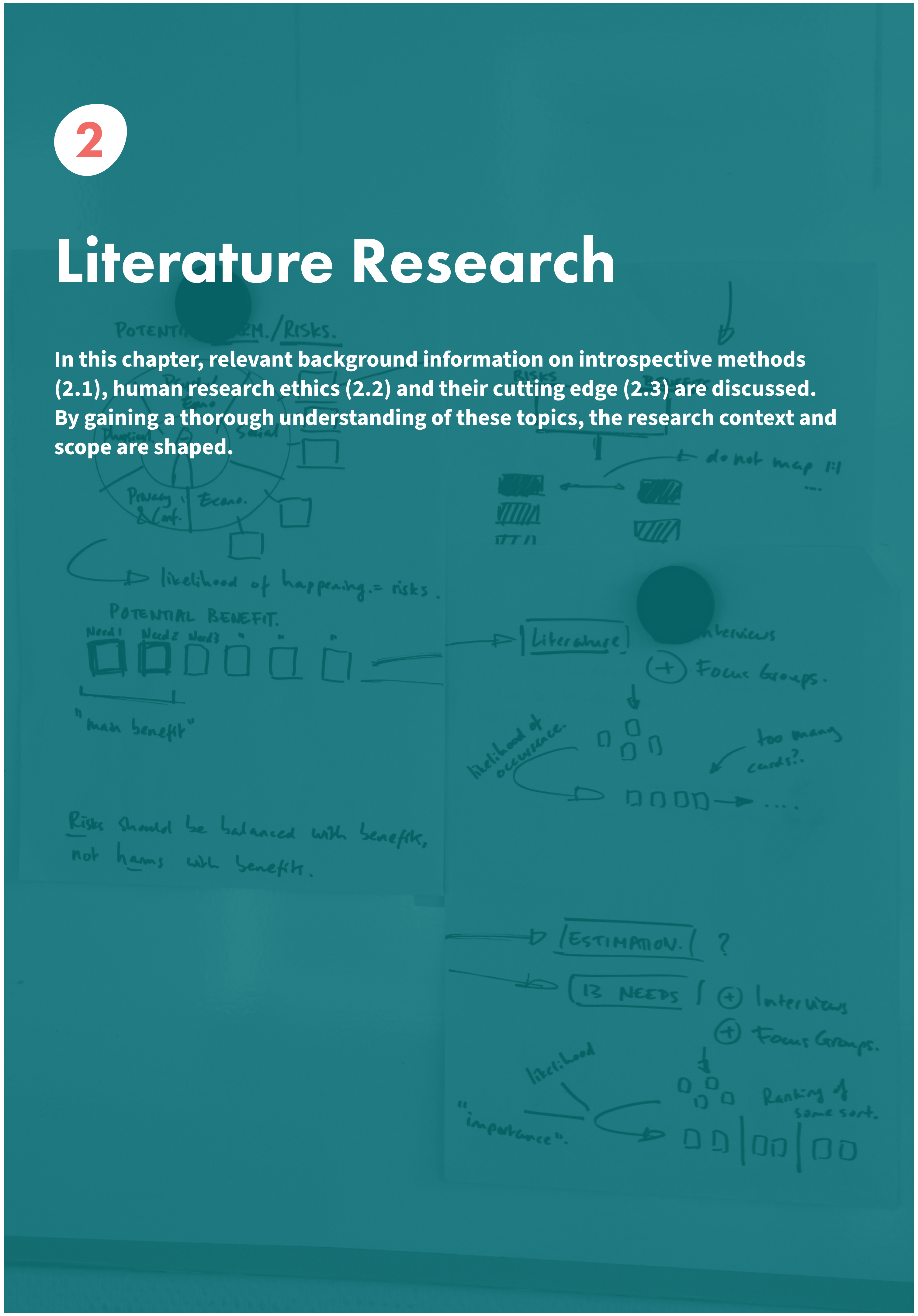
Figure 1.3 | *Overview of this project's design process*

1.4 Conclusion and Project Implications

In conclusion, this design project aims to address the lack of ethical guidance for introspective researchers. Researchers should have the means to protect themselves and others from potential risks of introspective studies, and this should be central to the research design.

This project aims to provide new insight into the main ethical risks and opportunities of researcher-introspection, how researchers experience this, what they need to be able to deal with risks, and how a tool can be designed that supports researchers to perform their research in a responsible way.

A project approach was established to form a structured path for achieving the project aim. Literature and empirical research will be performed to understand the context and to draw up a design goal and design requirements. Then, I will engage in iterative ideation, prototyping, and evaluation, resulting in a prototype for evaluation by different stakeholders. This will inform a design update, leading to the final design and recommendations.



2

Literature Research

In this chapter, relevant background information on introspective methods (2.1), human research ethics (2.2) and their cutting edge (2.3) are discussed. By gaining a thorough understanding of these topics, the research context and scope are shaped.

2.1 Introspective Methods

This project revolves around a specific type of research methods in design: introspective methods, and more specifically, researcher-introspection. This chapter outlines the foundations of researcher-introspection, how it is used, its contribution to the design field, and its challenges as retrieved from literature.

2.1.1 Introspective methods

What are introspective methods

Introspective or first-person methods are qualitative research methods that are characterized by the researcher investigating their own subjective experiences. It can be defined as "an ongoing process of tracking, experiencing, and reflecting on one's own thoughts, mental images, feelings, sensations, and behaviors" (Gould, 1995, p. 719). First-person methods allow phenomena that are fundamentally subjective and experiential to be studied by the researcher looking inward. This often happens along with "looking outward into the world, backward into the past, and forward into the future" (Xue & Desmet, 2019, p.41). Introspection should not be seen as a search for empirical truth, but rather a journey that leads the researcher to connect with their own understanding of the world, and in so doing connect with others (Chamberlain et al., 2017).

The use of self-introspection by researchers is not a new phenomenon. Despite not always being recognized or made explicit, it has been used by researchers in many disciplines:

> ***"Introspection is an inevitable part of consumer research used by all research workers. Although we often strive for the appearance and security of objectivity, this should not obscure the fact that all our thoughts are introspective comments and stories about what we observed, what we did, what we thought, and why we thought it."***
>
> (Levy, 1996, p. 172-173)

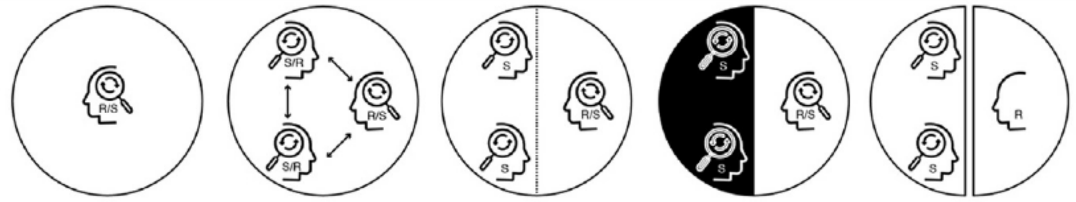
In a sense, introspective methods give researchers a method to verbalize and externalize the use of introspection.

Rejecting Dualism

Most introspective methods are mainly based on the rejection of the objectivity-subjectivity dualism and the science-art dualism. Introspection allows experiential and subjective phenomena to be studied, and hereby challenges conventionial views on what research is and how research should be done. Subjectivity is (ironically) regarded as introspection's major weakness because others cannot examine one's inner states. However, it is also it biggest strength, because one can never know as much about other's inner states as about one's own (Gould, 1995).

Besides, introspection embraces capturing experiences in evocative ways, ways that can be felt rather than analytically understood. Anderson (2006) highlighted that up to this point, autoethnography (a popular introspective method) has predominantly adopted an evocative approach, blurring the distinctions between social science and literature.

Figure 2.1 | *Five types of introspection.*

	Researcher Introspection	Interactive Introspection	Syncretic Forms of Introspection	Reflexivity within Research	Guided Introspection
Illustration					
Features	*Researcher as Subject* No subjects other than the researcher are involved as the introspector.	*Subjects as Co-researchers* The researcher and subjects form a collaborative and mutually empathic introspecting group.	*Researcher and Subjects as Individual Introspectors* The researcher includes his/her own introspections as part of the data.	*Researcher and Subjects as Individual Introspectors* The researcher uses his/her introspections to enable contrasting comparisons.	*Researcher as the Guide Subjects as the Introspectors* The researcher does not introspect, but only guides the subjects to.
Focus	The researcher him/herself	Both the researcher and subjects	Both the researcher and subjects	The subjects	The subjects
Epistemic Perspectives	**Researcher/Subject (R/S):** first-person	**Researcher/Subject (R/S):** first-person & second-person **Subject/Researcher (S/R):** first-person & second-person	**Researcher/Subject (R/S):** third-person & first-person **Subject (S):** first-person	**Researcher/Subject (R/S):** third-person & first-person **Subject (S):** first-person	**Researcher (R):** third-person **Subject (S):** first-person
Relevant Method Examples	Autoethnography Self-experimentation Personal Subjective Introspection Confirmatory Subjective Introspection	Co-design Workshop Empathic Design Methods Experience Prototyping	All cases in which the researcher applies the same guided introspection process to him/herself as well as to the subjects without direct introspection exchange	Participant Observation	Verbal Protocol Analysis In-depth Phenomenological Interview Written Self-report UX Curve Drawing Sentence Completion Experience Survey

Note: Adapted from "Researcher introspection for experience-driven design," by H. Xue and P.M. Desmet, 2019, Design Studies, 63, p.46. https://doi.org/10.1016/j.destud.2019.03.001

Ways to practise introspection

Temporal manner

Within introspection, different temporal manners for practising introspection have been distinguished by Wallendorf and Brucks (1993): retrospective, concurrent and imaginary introspection. The first depends on a recollection of events that occurred in the distant past. Concurrent introspection means that the introspector documents (and sometimes also analyzes) experiences as they occur or after a small amount of time. By minimizing the delay between the experience and the data documentation and initial analysis, the experience can be recorded with rich detail and examined from a first-person perspective with little distortion. Lastly, imaginary introspection can best be described as a process of envisioning future possibilities, by developing hypothetical introspective narratives (Xue & Desmet, 2019).

Narrative vs Metacognitive introspection

Within introspection, Gould (2006) distinguishes between narrative introspection and metacognitive introspection, which differ in their way of inquiry and the data they produce. Narrative and metacognitive introspection can be considered two ends of a continuum. Both are essential, coexisting qualities in every introspective study, and are often not easily separated (Xue & Desmet, 2019). Narrative introspection generates narratives, e.g. stories, dialogues or autobiographical writings, as data. Metacognitive introspection involves one investigating one's own mind and consciousness (or an aspect of those) in psychological and/or meditational terms by watching one's thoughts and feelings in real time. This results in metacognitive descriptions rather than a complete narrative (Gould, 2006).

Researcher-introspection is open to collecting, analyzing and presenting all kinds of self-data, also if they have little narrative quality (Xue & Desmet, 2019). Whereas writing is the most common form of data, researchers can also document photos, video, audio, drawings or even prototypes.

Autoethnography

Introspective methods may be introduced under different names in scholarly works from different disciplines. In human-computer interaction research, introspective methods are more often called "first-person methods" (Höök et al., 2018; Lucero et al., 2018). In sociology, anthropology, and communication research, the name "autoethnography" is more well known (Adams et al., 2017; Ellis, 1999; Ellis & Bochner, 2000). The latter is also the best known introspective method. Autoethnography can be described as "an approach to research and writing that seeks to describe and systematically analyze (graphy) personal experience (auto) in order to understand cultural experience (ethno)" (Ellis et al., 2011, para .1) Autoethnography is both something you do and write, both the process and the product. It often produces rich and evocative descriptions of personal experiences.

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Researcher-introspection

Wallendorf and Brucks (1993) have identified five categories of introspective methods. An overview of these types can be found in Figure 2.1 (Xue & Desmet, 2019). From these categories, researcher-introspection is an extreme form of introspection in the sense that it is the only category that involves only the researcher themselves, no other researchers or subjects. Researchers in this category study their own relevant experiences, emotions, thoughts, imaginations, or other. Researchers might collaborate with others in the analysis of their introspective data, but the act of introspection itself is done solely. In the other forms of introspection, the researcher introspects together with others, or guides others to introspect.

2.1.2 Introspection in design

With the rise of experience driven-design in recent years, introspection have gained increasing popularity because it allows to study phenomena in a deep, rich, vivid way (Xue & Desmet, 2019). To illustrate, Xue and colleagues identified and characterized 20 distinct mood states that users might experience before and after engaging with designed systems, through a process of researcher-introspection and collaborative introspection with a number of co-researchers (Xue et al., 2020).

(Researcher-)Introspection can be utilized at different stages in the design process. This is illustrated in Figure 2.2, where different types of introspection have been mapped onto the Double Diamond Model (Design Council, n.d.). This model proposes a four-phase structure for the design process.

Introspection for design

In the discover & define phases, which are more research-oriented, introspection can be used to study a certain phenomenon. The retrieved information can then serve as input for the later Develop & Deliver stages, which are more design-oriented. Therefore, this type of introspection can be considered introspection *for* design. Since data collection and meaning making

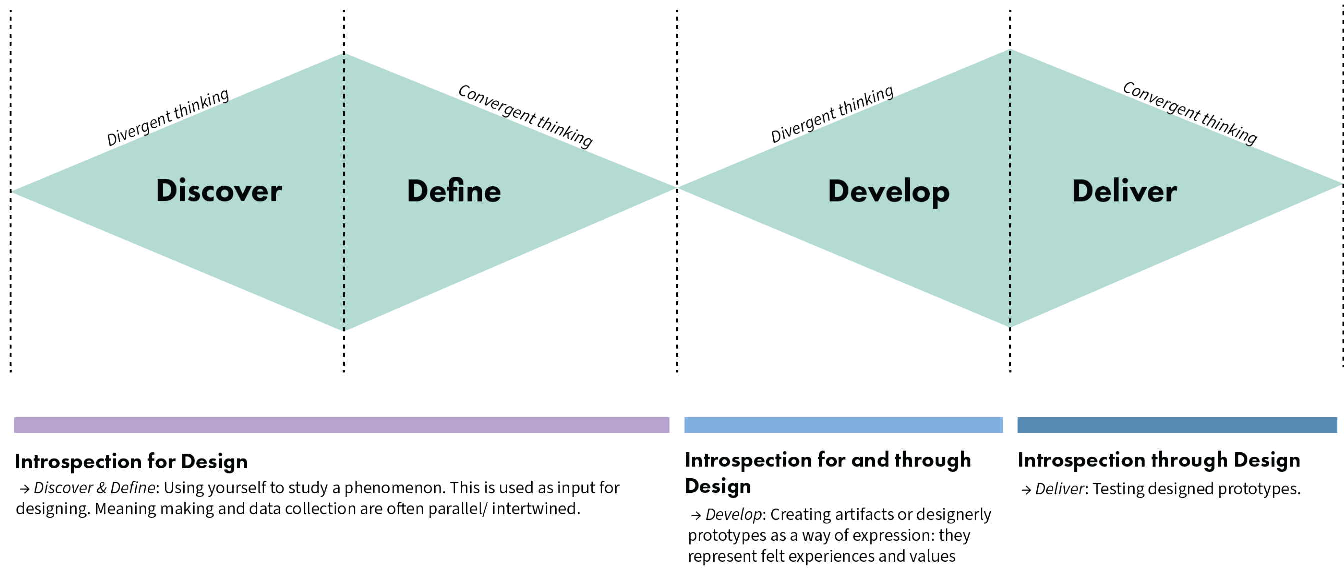

Figure 2.2 | *Introspection mapped onto the design process*

are often intertwined and happen in parallel during introspective research, the discover & design phases are here treated as one. Below, a few prime examples are outlined in which introspection is used to study a phenomenon:

1. In this study, the longitudinal travel experiences of a single individual are explored, resulting in two design explorations of personalized technology the autoethnographer created for aiding his travel (Jain et al., 2019).
2. The phenomenon of anxiety prompted by academic stress in a year of COVID-19 is studied, serving as input for a design artefact (Michie & Steagall, 2021).
3. Through an autoethnographic bird watching practice combining field observation, journaling, and making practices, it is examined how noticing affects the researchers and their way of relating to birds (Biggs et al., 2021).

Introspection for and through design

Introspection can also take place in the develop phase of the design process. Researchers can make designerly artefacts to represent introspective data. This is introspection *for design as well as through design*. The researcher introspects for the design objects to be manifested, as well as through the designed objects. This is reflected in the following two papers:

1. In this study the term Design Memoirs is proposed for first-person practices and reflections. Design Memoirs are subjective and corporeal in nature, and provide a direct and observable way to reckon with felt experiences through, and for, design (Devendorf et al., 2020).
2. This study explores generative dimensions of reflection, shifting the focus of inquiry from tracking data to generating insights by visual practice (Jung & Trischler, 2021).

Introspection through design

In the deliver phase, researchers might use themselves to test prototypes and introspect on their experiences. This is introspection *through* design. Examples of this are:

1. In this paper, the researcher introspects on their personal experiences of how garden work and the garden change when a robotic lawn mower is introduced (Verne, 2020).
2. The researcher introspects on the use of personal fitness and self-tracking technologies to lose weight (Williams, 2015).
3. In this study, the researcher explores the quality of running experience under the scaffolding of one particular audio adventure and running app 'Zombies, Run!' (Witkowski, 2013).

2.1.3 A taboo method

Despite the increasing popularity of this method, researchers can still be hesitant to acknowledge that they used (subjective) introspective data in their research. Rather, researchers hide the results of their self-introspections (intentionally or unintentionally) behind presented 'objective' data (Xue & Desmet, 2019).

A reason for this might be the designer-user dualism that emerged during the prime of usability research, claiming that "users are not designers and designers are not users" (Nielsen, 1993,pp. 12-13). However, these user-centered considerations in usability research were relatively rational and pragmatic requirements (completing tasks). As design started focusing more on people's experiences, the idea of user-centeredeness has evolved into human-centeredness. This instigated that operational efficiency may not necessarily be the only or foremost consideration when designing. This designer-user dualism is also challenged by Xue and Desmet (2019). They argue that, by design researchers embracing their own humanness, they can be their own human research subject and use themselves as a measuring instrument to understand human phenomena.

2.1.4 The Value of Researcher-Introspection

Reasons for doing researcher-introspection

There are different reasons why researchers might opt for using researcher-introspection as a method rather than another (qualitative) research method.

Perhaps the most important reason to do introspection is the richness of data that is inherent to introspective methods. Through introspection, it is possible to

uncover thoughts or feelings that other people might be hesitant to share. It can help to uncover needs/information that other users might have difficulty with expressing. Besides, researching yourself gives you 24/7 access to this data.

Introspective research can also allow designers to empathetically connect with users by tapping into their own subjective experiences. This deep understanding of the user's lived experiences enhances the design process, leading to the creation of more meaningful, engaging, and human-centered products, services, and environments. It can complement and enrich more objective and external research methods, providing a holistic view of user experiences.

Furthermore, introspective methods leaves the researcher in control of the data collection as well as the analysis and presentation. This way, researchers do not have to fear "losing control of our words and experiences to another researcher" (Ellis, 2007, p.21).

Lastly, engaging in introspective research allows the researcher to deepen their self-awareness and gain a better or more holistic understanding of their thoughts, emotions, and motivations. According to Philaretou and Allen (2006), self-reflective accounts have considerable therapeutic power and can encourage autoethnographers towards positive change. This is also acknowledged by Ellis et al. (2011) who argue that writing from an autoethnographical perspective opens up opportunities for a.o. expanding consciousness, improving relationships and reducing prejudice.

Benefits to the Design Field / Scientific community

Whereas the forementioned reasons for doing introspective are more self-centered, doing introspection can also be beneficial to the design field or scientific community in general.

Advancement of Knowledge

Introspective research adds a subjective dimension to the existing body of research, enriching our understanding of complex phenomena, human experiences, and psychological processes. For example, introspection can open up inquire to difficult experiences that have not been seen from a first-person perspective, such teen pregnancy (Lapadat, 2017). This added subjective dimension can ultimately lead to the development of new theories, frameworks, and perspectives.

Enrichment of Qualitative Methodologies

Introspective research complements and enriches qualitative methodologies by providing first-person insights and subjective narratives. It enhances the depth and richness of qualitative data, enabling a more comprehensive understanding of phenomena.

> ***"The personal stories of autoethnography are presented in a narrative format that is more accessible to a broad audience than is traditional research writing"***
>
> (Lapadat, 2017, P. 593)

Systematic Challenges

Despite the value of introspective methods, there have been outspoken opponents in different fields, who have criticized introspective methods mainly around four methodological issues (Wallendorf and Brucks, 1993):

1. *Low data accuracy*: Researcher introspection has been most often conducted in a retrospective manner, however, the recollection of memory is unreliable and cannot be uncritically accepted as accurate descriptions of past experiences. Furthermore, unusual and extreme events are more easily remembered than the mundane, also resulting in a distorted memory of events.
2. *Lack of systematic data collection and documentation:* Introspective datasets are often "a series of undocumented recollections employed while writing a manuscript rather than a systematic recording of experiences that was separately analysed" (p. 347).
3. *Lack of a necessary distance in data analysis*: According to critics, the closeness between the researcher and researched obstructs the analytic distance that is needed to study a phenomenon.
4. *Low generalizability of the result:* The last issue is that if a researcher only researches their own experiences,

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the research results are hardly generalizable. These four issues reveal opportunities for the further systematic development of introspective methods

2.1.5 The Ethical Dimension of Researcher-Introspection

Rooted in ethical intent

Whereas this project will address ethical risks of introspective methods, in a way introspection is actually rooted in ethical intent. Methods like autoethnography emerged in response to concerns about traditional, realist, and modernist approaches to social science research. Introspection can be seen as a method that "humanizes research processes and products and works to be more inclusive of how life is lived and how experience is storied" (Holman Jones, Adams & Ellis, 2013, p. 673).

Besides, introspection can be seen as ethically sound because it addresses a significant ethical challenge that can be found in ethnographic and other qualitative approaches to inquiry, namely, appropriating the voice of others in research (Ellis et al., 2011; Holman Jones et al., 2013). Introspection mitigates the power imbalance between vulnerable participants and a researcher who remains invisible and retains control over the narrative that is conveyed (Etherington, 2007).

Lastly, (researcher-) introspection holds that the researcher researches themselves, so they don't have to expose external participants to potential harm. This was one of the reasons for Ellis (2007) to use introspection: it gave them "the freedom to explore emotional trauma without worrying about doing emotional harm to other vulnerable participants" (p. 21).

Ethical Risks

Despite its ethical intent, researcher-introspection has been facing ethical challenges that have been addressed by different researchers in the field. Two main areas can be identified in which ethical risks have been present: 1) the Vulnerable Self and 2) Referring to others.

1. Vulnerable Self

Introspective methods hold that the researcher has a dual role, they are both researcher and researched, i.e. "researcher-introspector" (Gould, 1995; Woodside, 2014). This dual role holds that the researcher is highly involved, as well as that introspective research can often be very personal and revealing. This puts the researcher in a vulnerable position, and brings along unique risks.

2. Representing others in your research

While introspection indeed avoids appropriating the voice of external research participants, still often other people are represented in a researcher's introspective account. Because personal experiences almost always implicate others in our lives, introspection also raises ethical concerns regarding the potential impact towards those people who are represented in introspective accounts (Helms & Fernaeus, 2021). For example, when writing about other people's lives, it can be difficult to protect their privacy and confidentiality.

The people who are referred to in an introspective account may have no say in what is made public. This is illustrated by Edwards (2011) who reflects on her personal experience of being described and identified in someone's autoethnographic narrative without her permission. She describes the negative impact it had on her and her team: "I felt silenced and judged. I had no way to offer a counter-narrative or further context" (p.2). She felt that some of the claims that the authors made were exaggerated, and some untrue.

Besides the researcher-introspector and those who are represented in their research, there are other actors who might be affected by ethical risks more indirectly. These include readers of the research, research supervisors, research institutions or even society as a whole. These actors are excluded from the scope of this project.

Risk dimensions in introspection

Through literature research, a variety of ethical risks to the researcher (Table 2.1) and those referred to (Table 2.2) have been identified.

Search Strategy

To identify relevant papers in the distinct area of introspective ethics, Google Scholar was searched due to its wide variety of disciplines and sources. The following terms were used as search keywords: "autoethnography" AND "ethics". Autoethnography was chosen as a keyword rather than introspection due to its popularity.

To select eligible papers, a selection was made based on the following inclusion criterium: the paper discusses one or more ethical risks of introspection relating to the researcher or those referred to in a study. Note: the paper did not explicitly have to refer to risks as 'risks', this could be read in between the lines. The following exclusion criteria were applied: The paper 1) is not in English; or 2) or too short (e.g., workshop call, abstract). This step yielded three relevant papers.

Through backward snowballing, five more papers were selected. Lastly, two more papers were selected based on reading the full-text sources of a previous (unpublished) literature review study (Xue & Van Kooten, 2023). The literature search was finalized after repetitive similar risk findings. An overview of the literature search and selection can be found in Figure 2.3.

Table 2.1 | *Identified risk dimensions relating to the researcher*

Risk Dimension	Description	Potential risks	Sources
Psychological / Emotional Risk	Researcher-introspection may result in undesired changes in thought process and emotion.	Painful to recall past difficult events.	(Chatham-Carpenter, 2010) (Edwards, 2021) (Lapadat, 2017)
		Hard to deal with difficult or unexpected emotions or insights.	(Edwards, 2021)
		The act of introspection might negatively affect enjoying the moment/ being in the moment.	(Chatham-Carpenter, 2010)
Privacy / Confidentiality Risk	Researcher-introspection might result in intrusion of one's solitude or into one's private affairs, public disclosure of private information, or unwanted identifiability.	Intrusion of privacy: crossing your own privacy boundaries.	(Chatham-Carpenter, 2010)
		Loss of confidentiality: sharing of information that can lead to unwanted identifiability.	(Doloriert & Sambrook, 2009)
Social Risk	Researcher-introspection might result in a negative impact on one's social situation, such as embarrassment within a social group, negative judgment, changing relations or loss of reputation.	Loss of reputation.	(Edwards, 2021) (Lapadat 2017) (Chatham-Carpenter, 2010)
		Embarrassment when sharing personal things	(Philaretou & Allen, 2006)
		Negative influence on relations / negative judgment by others.	(Lapadat, 2017)
		Negative influence on the relationship you have with people you refer to.	(Chatham-Carpenter, 2010) (Lee, 2018)
Economic Risk	Researcher-introspection might result in negative consequences to one's economic status, including one's income and job opportunities.	Sharing personal things (e.g. illness, negatively referring to others) can negatively affect job opportunities.	(Edwards, 2021) (Rambo, 2016) (Lapadat, 2017)
Physical Risk	Researcher-introspection might result in experiencing physical pain or discomfort when studying a phenomenon in unsafe situations or under unsafe circumstances.	Performing research with unsafe/untested prototypes can result in pain/discomfort.	(Pijnappel & Mueller, 2013)
		Studying a phenomenon in unsafe situations or under unsafe circumstances can result in pain or discomfort.	(Homewood et al., 2020)

The risks have been clustered into the following 5 risk dimensions:
1) Psychological / Emotional Risk;
2) Physical Risk (this dimension is only applicable to the researcher);
3) Social Risk;
4) Privacy / Confidentiality Risk;
5) Economic Risk.
Harm caused in any of these dimensions can have a negative effect on the wellbeing of the researcher or those referred to.

Figure 2.3 | *Literature search and selection*

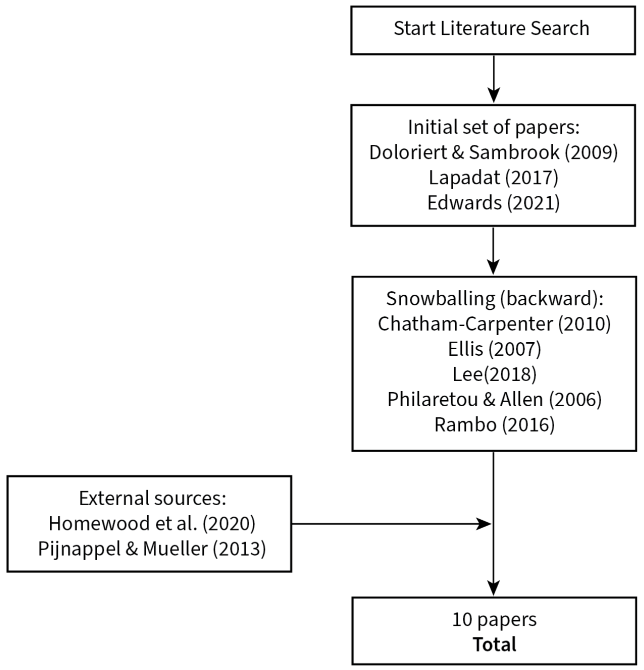

Table 2.2 | *Identified risk dimensions relating to those referred to in the research*

Risk Dimension	Description	Potential risks	Sources
Psychological / Emotional Risk	Being referred to in research may result in undesired changes in thought processes and emotion.	Painful to be negatively represented.	(Edwards, 2021)
Privacy / Confidentiality Risk	Being referred to in research might result in intrusion of one's solitude or into one's private affairs, public disclosure of embarrassing private information, or unwanted identifiability.	Privacy is intruded: more is shared of you than agreed upon or no consent was given at all.	(Lapadat, 2017)
		Loss of confidentiality: information of you is shared that can lead to unwanted identifiability.	(Lapadat, 2017) (Lee, 2018)
Social Risk	Being referred to in research might result in a negative impact on one's social situation, such as embarrassment within a social group, negative judgment, changing relations or loss of reputation.	Loss of reputation.	(Ellis, 2007)
		Embarrassment for what is revealed about you.	(Philaretou & Allen, 2006)
		Negative influence on relations / negative judgment by others.	(Edwards, 2021)
		Negative influence on the relationship with researcher.	(Edwards, 2021)
Economic Risk	Being referred to in might result in negative consequences to one's economic status, including one's income and job opportunities.	Reveal of personal information (e.g. illness, negatively referring to others) can negatively affect job opportunities.	(Edwards, 2021) (Rambo, 2016) (Lapadat, 2017)

2.2 Human Research Ethics

The goal of this project is to support the wellbeing of researchers by addressing the ethical risks that might arise from doing researcher-introspection. In this chapter, relevant background information on Human Research Ethics is presentend, with a particular focus on institutionalized ethics within the TU Delft.

2.2.1 What is Human Research Ethics?

Ethics

Ethics is the systematic reflection on morality (Van de Poel & Royakkers, 2011). It is a process of questioning, discovering and defending what is right and wrong. It can be helpful to consider ethics as the study of 'should'.

Research Ethics

Research Ethics involves the application of fundamental ethical principles to the planning and execution of research activities to ensure responsible conduct of research. This is in place to ensure that no negative impact is generated to society, the environment, animals or human participants in your study.

Human Research Ethics (HRE)

HRE is concerned with any research that involves humans, either directly of indirectly. HRE originates from the biomedical field, starting with the Nuremberg code in 1947 and the development of the Declaration of Helsinki in 1964. This declaration outlines a number of essential ethical principles for medical research that involve human research subjects and it is considered the most important document in the history of research ethics (Hardicre, 2014). In accordance with European guidance on research ethics, institutions like the TU Delft also apply these principles to non-medical human research, like many projects in Industrial Design Engineering.

According to the TU Delft procedures on Human Research Ethics: "Research Ethics as a whole are about ensuring that your research is planned and executed in a way which will not generate undue harm, or take disproportionate risks, that could negatively impact Human Research Subjects, society, the environment or even researchers themselves" (TU Delft, n.d.-a). Remarkable here is that 'researchers themselves' are mentioned separate from Human Research Subjects, which implies either that a) researchers are not human or b) researchers are not research subjects. Assuming that researchers are human, this illustrates that introspective research is still uncommon practice within TU Delft – and assumably in more institutions where design research takes place.

This project specifically focuses on the impact of research on Human Research Subjects, which in the case of researcher-introspection means the researcher themself.

2.2.2 HRE in design

Many studies in the domain of Industrial Design Engineering involve research with Human Research Subjects. Nowadays, more and more attention is being paid to ethical underpinning of the research approach that is followed to avoid undue harm. In qualitative research, typical ethical challenges are informed consent, anonymity and confidentiality (Sanjari et al., 2014). Researchers carry a responsibility to take Human Research Ethics into account when designing and

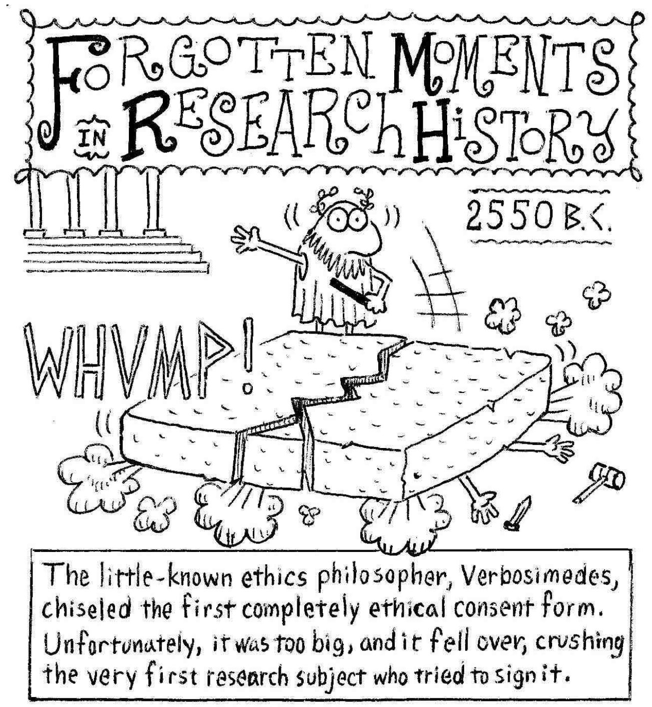

Figure 2.3 | *When procedural ethics don't work out for you (Mayne, 2021)*

executing a study, to make sure that participation in a study is voluntary, informed and safe for participants. This usually involves anticipating and minimizing risks, communicating this to participants through informed consent, and managing risks throughout the study.

2.2.3 Procedural ethics

Whenever researchers within an institution like TU Delft want to do research on human subjects, they are obliged to adhere to procedural ethics. Procedural ethics has been labelled by Guillemin and Gillam (2004). It is the kind "mandated by Institutional Review Board committees to ensure procedures adequately deal with informed consent, confidentiality, rights to privacy, deception, and protecting human subjects from harm" (Ellis, 2007). Procedural ethics typically involve norms, standards and procedures that support researchers with the planning and conduct of research and with researchers' responsibilities in that (Hunt & Godard, 2013).

Ethical codes & guides

Codes of Conduct are codes in which organizations lay down guidelines for responsible behavior (Van de Poel & Royakkers, 2011). These can be professional (formulated by professional associations) or corporate (formulated by a company).

Researchers have to adhere to ethical codes/guides. There is not one universal ethical code. There are ethical codes/guides on many levels. They can vary by region, discipline, institution, and subject matter. Typically, they revolve around the following three key principles: Respect for person, Beneficence and Justice.

As for Industrial Design Engineering students, there is a professional code of conduct for engineers. All professional codes include the obligation to practice your profession in a competent way, with integrity and honesty.

Researchers typically follow the ethical code of the institution they are performing their research under. These ethical codes are again situationally informed. The ethical codes of the TU Delft are based on the ethical codes of the EU, which are again based on the explicit European commitment to human rights.

Another hierarchy of ethical guidelines can be found when looking at "research" as a whole. Within all research, ethical guidelines have been defined for qualitative studies (as opposed to quantitative). Within qualitative studies, there are ethical guidelines for the ethnographic/anthropologic domain - which was early in adopting introspective research.

Ethics at Dutch Technical Universities (4TU)

The TU Delft is part of the 4TU.Federation. This is a partnership of the four Technical Universities of the Netherlands (Delft University of Technology, Eindhoven University of Technology, University of Twente and Wageningen University), which is committed to strengthening and uniting technological knowledge. Below, the ethical codes and guides within 4TU are discussed.

Typically, institutes need to approve the research design, which requires researchers to deliver a form containing details about the research, including a risk assessment and mitigation plan. Additionally, informed consent forms are required in most cases. TU Delft also requires researchers to deliver a Data Management Plan to describe how data will be collected, managed, stored and shared during the study.

At Delft, Eindhoven and Twente, there are university broad HREC (Human Research Ethics Committee) approval procedures accounting for the possible risks to human research participants. This generally includes assessment of risks and benefits of the study, informed consent materials, assessment on privacy and a plan on how to collect, process and store data.

If you are a researcher, PhD candidate or Master's student at TU Delft and you are planning to conduct research which involves human Research Subjects, you are required to get HREC approval. At TU Eindhoven and TU Twente, this is also required for BSc students (TU Delft, n.d.-a; TU/e Studiegids, n.d.; UTwente, n.d.).

None of the ethical procedures of these technical universities contain consideration of risks to the researchers themselves.

Wageningen University has an ethical framework for research with humans according to the code of Nethics, which is the National Ethics Council for Social and Behavioural Sciences. At the moment of this research, the WUR-REC is undergoing a transformation. Whereas before, the ethical reviews were situated mostly in the social sciences department, the activities of the new REC are meant to cover the whole of the WUR. Their procedures and materials are under review at the moment, and are not open to the public.

2.2.3 Ethics in practice

Guillemin and Gillam (2004) have distinguished between procedural ethics and ethics in practice. As qualitative researchers, we go through IRB (Institutional Review Board) procedures, but we must also face dilemmas of ethics in practice. Ethical issues might emerge that were not predicted in the first review. Therefore, a distinction can be made between the expression of ethics in procedural documentation, which (arguably) cannot embody the range of situated ethical judgments researchers have to make in practice.

Guillemin and Gillam (2004) promote the role of researchers as reflective practitioners. Researchers should be ethically competent and self-reliant in both their practice and professional development, because rules and norms like the ones from IRB cannot address every possible situation. In the ethics in practice model, the IRB rather plays a backup role, offering formal independent review, consultation and exchange of thoughts.

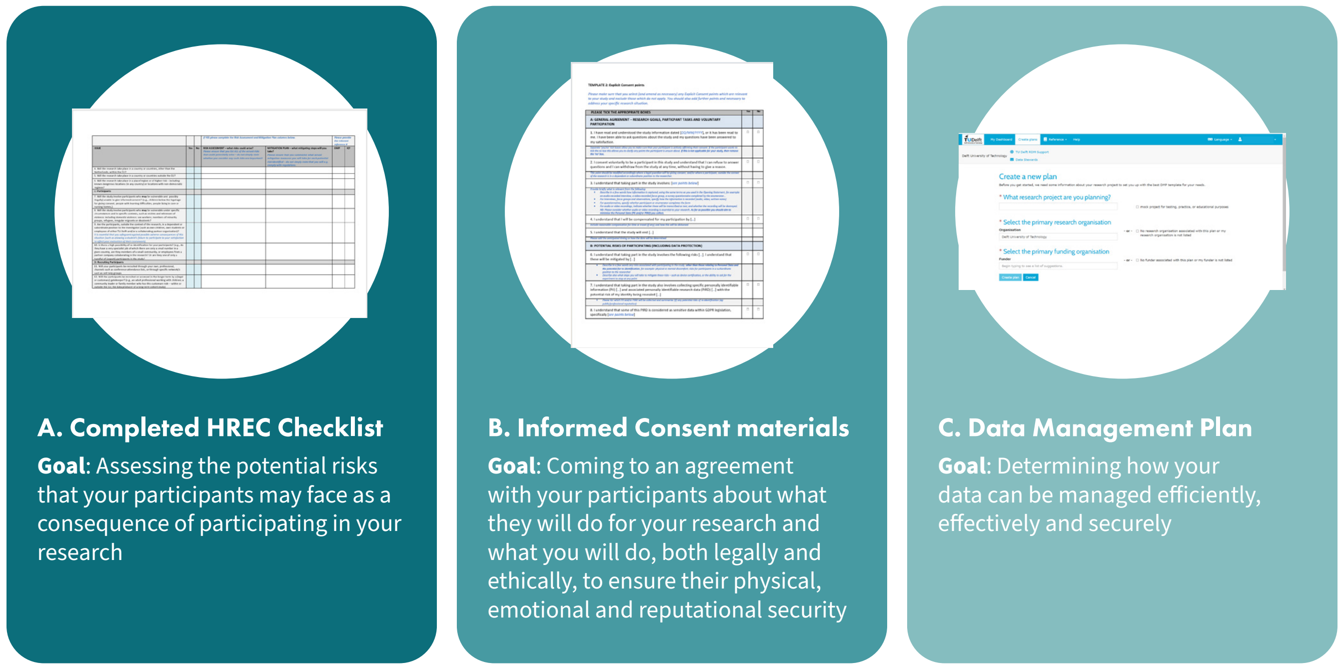

Figure 2.4 | *The main components of applying for ethical approval at TU Delft*

2.2.4 Researcher's responsibility

Researchers (and their supervisors) are primarily responsible for ensuring that research is conducted ethically. They carry a professional responsibility to follow good research practices. Such practices are based on fundamental principles of research integrity, including reliability, honesty, respect and accountability (ALLEA, 2023).

When performing research with human participants, researchers have the responsibility of protecting all participants in a study from potentially harmful consequences that might affect them as a result of their participation (Sanjari et al., 2014) (Rauhala & Kalokairinou, 2021). It is unethical to do research that is destructive to society or harmful to research subjects. This means, there are limits to the risks you can expose others to. The question arises if there are ethical limits on the types of risks and harms people may impose on themselves. On a personal note, this question lingered in my mind for a long time throughout this project.

Some different takes on this question can be found in literature. Mill's Harm principle, which is addressed a.o. in literature on self-experimentation, holds that actions of individuals should be limited only to prevent harm to other individuals. Over himself, over his own body and mind, the individual is sovereign (Saunders, 2016). Following this principle, arguably there are no limits on the type of risks and harms people may impose on themselves.

On the other hand, we may look at the ethics of self care - a moral obligation to engage in appropriate self care - in care professions (since you can only care for others if you first care for yourself). This implies that there are limits to the harm you should expose yourself to, given you are a caretaker (Irvine, 2014). Personally, I think it is always good to act from an attitude of care, also (or especially) towards yourself.

The abovementioned perspectives might help researchers think about their take on this and how that affects their personal boundaries. However, I later realized this project is not about whether it is ethical if a researcher exposes themself to risks that they can't ethically expose others to. People may have different perspectives on this, and I'm not claiming one or the other. Whether or not it is unethical to expose yourself to harm, it is important that researchers who want to do introspection have the means to deliberately consider the risks in their study, and take an active stance towards whether they will expose themselves to risks and harms or not. I consider this also part of researchers' professional responsibility, as a dimension of respect for themselves. Whether or not there is a limit on the harm a researcher can expose themselves to, is then up to them to determine.

2.3 On the cutting edge of Introspection and Human Research Ethics

In this chapter, the relationship between researcher-introspectors and institutional Ethical Review Boards is described, along with ways how researchers have dealt with ethical risks. We will end this chapter with recommendations from researchers in the field on how to deal with ethical risks in RI.

2.3.1 Generalized/universalized ethics

According to Ellis (2007), IRBs offer helpful guidelines, yet they rest on the assumption that research is done on stranger with whom we have no relationship and with whom we will never have a relationship. This is however not always the case when referring to others, which are typically friends or family members, and certainly not when introspecting about yourself. In a way, it is the closest relationship you will ever have. Thus, we encounter situations that do not correspond to those specified by ethical boards.

This does not necessarily mean that the procedural ethics at universities are irrelevant or destructive (Guillemin & Gillam, 2014). Firstly, ethics at institutions fulfill an essential role in safeguarding the basic rights and safety of human research participants from obvious harm. Secondly, procedural ethics provide researchers with an ethics "checklist". Despite that this checklist typically assumes that researchers do research on external participants, it at least makes researchers aware of the possibility that risks exist, and remind them to balance the risks and opportunities of their study. Lastly, by meeting the procedural requirements outlined in this ethical checklist, the researcher also gains institutional credibility to conduct the research.

Figure 2.5 | *Using tools to protect yourself and others from risks*

2. LITERATURE RESEARCH

Figure 2.6 | *Universal tools don't protect against all risks*

However, this still leaves a gap between procedural ethics and the realities of research practice. This goes for different (qualitative) research practices, but especially for introspective research where the researcher is the participant. This is also noted by Tullis (2013): "autoethnographers sometimes receive less oversight from IRBs than other researchers because scholars don't consult them and sometimes because IRBs don't consider autoethnography research" (p. 258).

> ***"I tell them no matter how strictly they follow procedural guidelines, situations will come up in the field and in interviews that will make their heads spin and their hearts ache"***
>
> (Ellis, 2007, p.23)

2.3.2 Avoiding institutional ethical procedures

Some researchers might opt for introspective methods to avoid ethical approval committees on purpose, e.g. when they want to research a sensitive topic (e.g. anxiety) that is hard to get approval for. Introspection can be seen as 'the way out', because you don't have to put others through risk. Additionally, it saves time from going through the (often time consuming) ethical procedures of institutions. Some researchers argue they can expose themselves to risks that they can't put others through: "Finally, we wanted to retain the 'extreme' quality of skateboarding as being an extreme sport, and came up with prototypes that involve activities that are potentially dangerous for participants, for example pulling strings attached to the skater's legs while skateboarding. Autoethnography allowed us to try these ideas out without compromising participants' safety (except our own)" (Pijnappel & Mueller, 2013, p.1272).

This also goes for research that impose a heavy work load on the participant: "Autoethnographical methods used in the field of personal health technologies have been seen to allow researchers to carry out research in ways that could be not requested of research participants due to the heavy work load required…" (Homewood et al., 2020, p.1781).

2.3.3 Need for additional measures

Institutional ethical guidelines provide a framework for dealing with ethical risks, however, this can be insufficient when it comes to providing guidance on the ethical dilemmas researchers face in practice. This is especially the case when it comes to unconventional research methods like introspection, that are inherently different from the positivist research methods that most IRBs are based on (Detardo-Bora, 2004).

To support ethical practice of introspective methods, researchers should have the means to deal with the situated ethics in their research. Currently, little practical support is available, apart from some papers addressing recommendations for ethical practice of autoethnographic methods. There's an urgency to make measures available that address the need described above, because introspective methods are growing in popularity within the design field, but more attention needs to be paid to the ethical risks. Researchers should have the means to protect themselves and others from potential risks of introspective studies, and this should be central to the research design.

2.3.4 How have researchers have dealt with ethical risks so far

Despite many researchers not explicitly stating that they used introspection as a research method, let alone mention any ethical considerations in their introspective studies, a few examples can be found of researchers who did. Since no rules for ethical practice in introspection exists, these researchers have all come up with their own way of ethics in practice:

1. Making an **informal dropout contract** (Devendorf et al., 2020).
2. Using the **ambiguity of designed objects** (rather than written text) so that you can express certain feelings / be vulnerable: "There are power dynamics in play, and a risk one takes in revealing oneself to ones community in this way. As such, we proceed with caution, using the ambiguity of design to cloak that which we don't feel comfortable saying in writing, while at the same time, giving itself to be interpreted in the memoirs we create" (Devendorf et al., 2020, p.3).
3. This paper explicitly states that they got **ethical approval**: "Following the receipt of ethical approval from our institution's Ethics Committee in August 2020, the first author undertook the research in her own home between 12 August and 31 October" (Turner et al., 2022, "Methodology" section).
4. Creating a **support network**: "Perhaps more important than the choice of research process is the choice of research team. If the researchers, investigators, technicians, and administrators can mutually support each other, emotional labour is much easier than where this is not the case" (Wolters et al., 2017, "Emotional Labour throughout..." section).
5. **Asking consent** from someone you refer to in your research: "In broadly researching my own breastfeeding experiences, I have followed these recommendations through frequent and active discussions with my partner (who is also my child's father and co-caretaker), which includes consent from myself and from him regarding how we individually and as a family feel about my research" (Helms, 2022, "research ethics" section).
6. Taking **privacy and confidentiality measures**: "Sharing of autobiographical experiences also raises ethical concerns regarding the potential impacts towards other closely related people. We approach this by omitting names and faces of our family members, receiving consent (from those who can) following a review of this manuscript, and by being transparent regarding our intentions to how designing for the caring of "loved ones" might be approached differently within interaction design as a result of our sharing" (Helms & Fernaeus, 2021, p.791).

These examples show that these researchers have considered risks well in time, and came up with their own strategies to address the risks in their specific project context.

2.3.5 Recommendations by researchers in the field

There is no official framework for how to deal with ethical issues in researcher-introspection. However, some researchers in the field have come up with guidelines or recommendations to help researchers deal with these issues. Below, I shortly list the guidelines proposed by 3 researchers: Tullis, Tolich and Ellis. These guidelines have been written for autoethnographic researchers, but hold value for introspective research in a broader sense.

1. Tullis (2013)

1. Do no harm to self and others;
2. Consult your IRB;
3. Get informed consent;
4, Practice process consent and explore the ethics of consequence;
5. Do a member check;
6. Do not present publicly or publish anything you would not show the persons mentioned in the text;
7. Do not underestimate the afterlife of a published narrative. (pp. 256-257)

2. Tolich (2010)

Consent
1. Respect participants' autonomy and the voluntary nature of participation, and document the informed consent processes that are foundational to qualitative inquiry (Congress of Qualitative Inquiry, 2007).
2. Practice "process consent," checking at each stage to make sure participants still want to be part of the project (Ellis, 2007).
3. Recognize the conflict of interest or coercive influence when seeking informed consent after writing the manuscript (see Jago, 2002; Rambo, 2007).

Consultation
4. Consult with others, like an IRB (Chang, 2008; Congress of Qualitative Inquiry).
5. Autoethnographers should not publish anything they would not show the persons mentioned in the text (Medford, 2006).

Vulnerability
6. Beware of internal confidentiality: the relationship at risk is not with the researcher exposing confidences to outsiders, but confidences exposed among the participants or family members themselves (Tolich, 2004).
7. Treat any autoethnography as an inked tattoo by anticipating the author's future vulnerability.
8. Photovoice anticipatory ethics claims that no photo is worth harming others. In a similar way, no story should harm others, and if harm is unavoidable, take steps to minimize harm.
9. Those unable to minimize risk to self or others should use a nom de plume (Morse, 2002) as the default.
10. Assume all people mentioned in the text will read it.

3. Ellis (2007)

Ellis (2007) identified two well-known ethical dimensions— procedural ethics and situated ethics—and described a third as relational ethics. Relational ethics "requires researchers to act from our hearts and minds, acknowledge our interpersonal bonds to others, and take responsibility for actions and their consequences" (p.4). In this study, she provides a large list of advice to those who do research with intimate others. Below, a few snippets of this advice are listed:

*

I tell them...
..."that my experiences writing ethnography and autoethnography have taught me that I have to live the experience of doing research with intimate others, think it through, improvise, write and rewrite, anticipate and feel its consequences. There is no one set of rules to follow
..."to seek the good"
... "[t]he wisest know that the best they can do...is not good enough. The not so wise, in their accustomed manner, choose to believe there is no problem and that they have solved it" (Malcolm, 1990, p. 162).
... "to be wise, but not cynical"
... "to pay attention to IRB guidelines, then warn that their ethical work is not done with the granting of IRB approval"
... "no matter how strictly they follow procedural guide lines, situations will come up in the field and in interviews that will make their heads spin and their hearts ache."
... "they should make ethical decisions in research the way they make them in their personal lives. Then I caution them to question more and engage in more role taking than they normally do because of the authorial and privileged role that being a researcher gives them"
... "to ask questions and talk about their research with others, constantly reflecting critically on ethical practices at every step"
... "to think of the greater good of their research—does it justify the potential risk to others? Then I warn that they should be cautious that their definition of greater good isn't one created for their own good"
... "they should let their participants and those they write about read their work"
*

Reflecting on researchers' recommendations

These recommendations provide researchers with concrete tips on how to plan and conduct their studies in a more ethical manner. A limitation of these recommendations is that they are not tailored for introspection in design. Another limitation of these recommendations is that it is less practical for young researchers, who do not yet have a clue on what to do in an introspective study. Novice introspective researchers will likely not search for these recommendations when making a plan for their project. Searching relevant recommendations, distilling them from the literature and thinking about how to apply them in your project context takes time. Therefore, an opportunity for design can be recognized in making risk considerations for researchers more practical and accessible.

2.4 Conclusion and Project Implications

In this chapter, relevant background information on Introspective Methods, Human Research Ethics and their cutting edge has been explored and outlined.

Introspective methods can be very valuable to a design process, because it leverages rich, experiential data, leaves the researcher in control, and creates empathy. Besides, it is beneficial to the design field and scientific community as a whole.

Introspection can be used in different stages of the design process. It is most often used in the beginning of the design process, to understand phenomena and gather insights for designing. Besides, it is often used as a way of testing and evaluating designed prototypes.

Despite that this method is rooted in ethical intent, a variety of ethical risks can be found in literature. Through literature research, five risk dimensions have been defined with regard to the researcher themselves, as well as the people they represent in their research.

Many studies in the domain of Industrial Design Engineering involve research with Human Research Subjects. In qualitative research, typical ethical challenges are informed consent, anonymity and confidentiality. In institutions like TU Delft, procedural ethics are established to ensure that researchers plan and execute their research in a way that protects subjects from harm. However, these generalized ethical procedures don't account for the dual role of the researcher-participant and do not offer guidance on how to deal with the ethical issues of introspective practice.

Different recommendations from researchers in the field can be found on how to deal with the risks of introspection. These are however not tailored for design practice, and distilling them from literature and thinking about how to apply them in your project context would take time.

This chapter underscores the need for a guide for introspective researchers regarding ethics in practice, and more specifically, in design practice.

3

Empirical Research

This chapter describes four empirical studies undertaken to understand what risks and opportunities researcher have encountered in introspective studies, how they have dealt with these and what they need in order to deal with them in the future. This includes a focus group with students with prior experience with introspection (3.3), two interviews with experienced introspective researchers (3.3), an introspective self study (3.4) and an expert interview with a researcher with expertise in design research methods (3.5).

3.1 Preparing for empirical studies

3.1.1 Risk cards
During literature research, 20 common risks that researchers might encounter during introspective research have been identified, which have been subdivided into five risk dimensions. To understand researcher's experiences with the identified risks, the risks were printed on cards to be used during the empirical studies. Before use, the cards were reviewed by one IDE student and iterated to improve clarity in design and language.

3.1.2 13 Fundamental Needs
Besides risks, the goal for empirical research was also to understand researcher's experiences with the opportunities of introspection. To discuss the opportunities, the 13 Fundamental Needs by Desmet and Fokkinga (2020) were used as a tool for discussion. This is a design-focused typology of psychological human needs, suitable for research with a focus on user experience and well-being. To support discussion on the 13 fundamental needs, the Illustrated Needs Overview pages were printed onto cards.

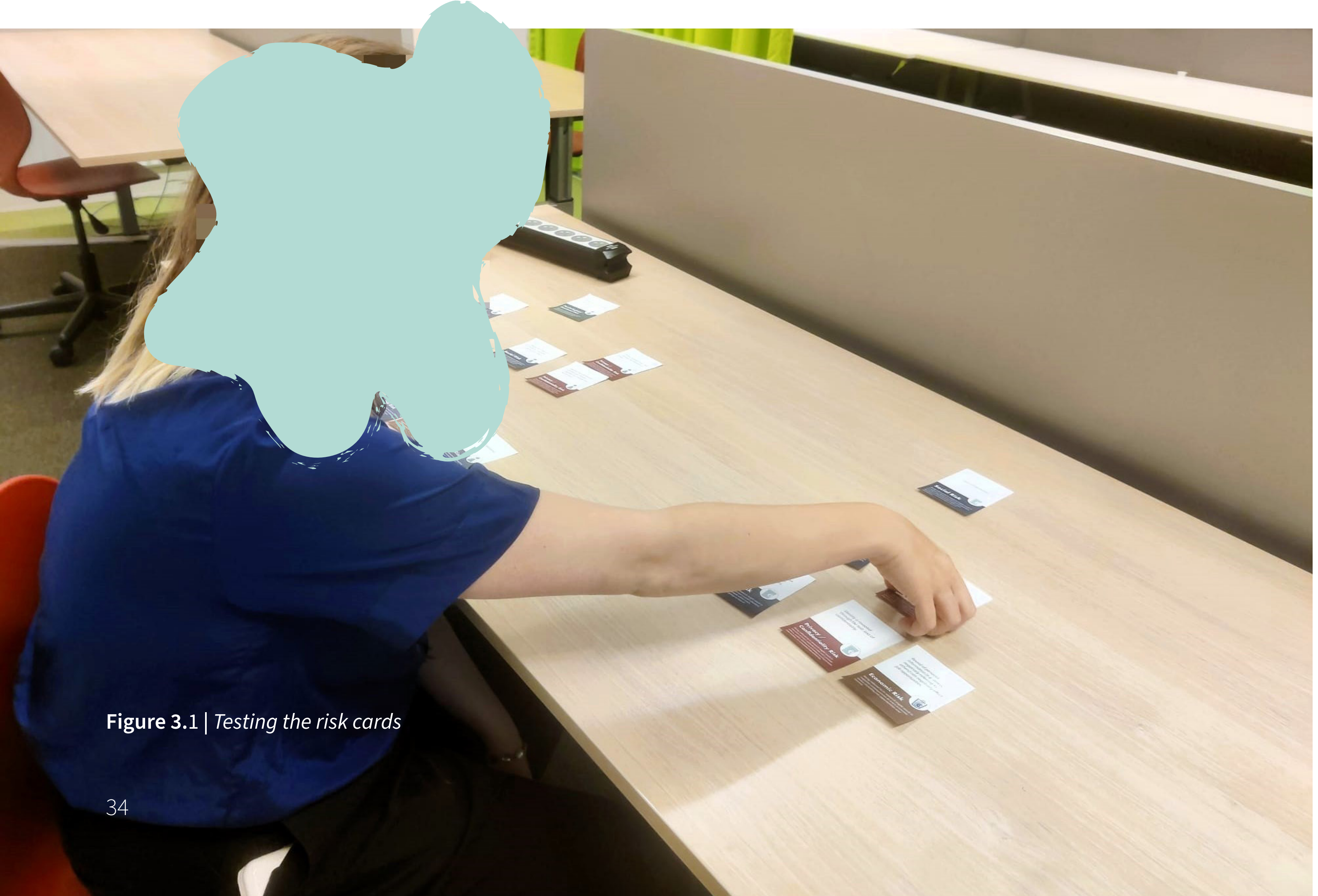

Figure 3.1 | *Testing the risk cards*

3.2 Focus Group

3.2.1 Goal
The goal of this focus group study was to collaboratively introspect on students' experiences with introspective research in order to understand what risks and opportunities students have encountered in their introspective projects, how they have dealt with these, and what they need as introspective researchers.

3.2.2 Method
Participants

Three master students from the IDE Faculty of Delft University of Technology were recruited to participate in this study. Participants were recruited through opportunistic sampling, using personal networking and referrals within my professional contacts. A requirement was that they had to have some previous experience with introspective research.

Two of the participants had completed the course Introspective Design at the IDE Faculty, and one participant had employed introspection as a method in a design project. One participant cancelled the focus group last minute but agreed to meet one on one at a later time.

Procedure

This study was approved by the HREC committee. To sensitize the participants for the focus group, I asked them to think about three questions before the study: 1) What risks (=potential harm to yourself or others) have you experienced from introspective research?; 2) What risks have you thought about? 3) What benefits have you gained from introspection?

During the focus group session, conversations consisted of semi-structured, open-ended questions. Participants were encouraged to have conversations with each other and respond to each other's statements freely. After discussing our experiences with introspection openly, the risk cards were used to discuss any risks that participants had encountered. To uncover the benefits that participants had experienced from using this method, the 13 Fundamental Needs were used to discuss which of these needs were fulfilled by doing introspection (Desmet & Fokkinga, 2020). We ended the session by discussing their needs as designers/ researchers, and what they would desire in a tool. The one on one discussion followed a similar setup.

The session was audio-recorded and transcribed. To interpret the data and find patterns, the statement card method as described by Sanders & Stappers (2020) was used. The following steps have been taken: 1) Transcribing audio to text; 2) Highlighting relevant/ interesting pieces of the conversation; 3) Collect the quotes; 4) Interpret the quote and write it into a paraphrase; 5) Clustering the paraphrases; 6) Relating the clusters.

Some low-level points of discussion were raised during this study, see Appendix F.

3.2.3 Insights
Ethics in general

1. Ethics in general is relatively new territory

The participants agreed that they were relatively **new to ethics in general**. One participant mentioned: *"I also feel like a lot of the elective classes that I took don't*

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Figure 3.2 | *Using the 13 Fundamental Needs to discuss opportunities*

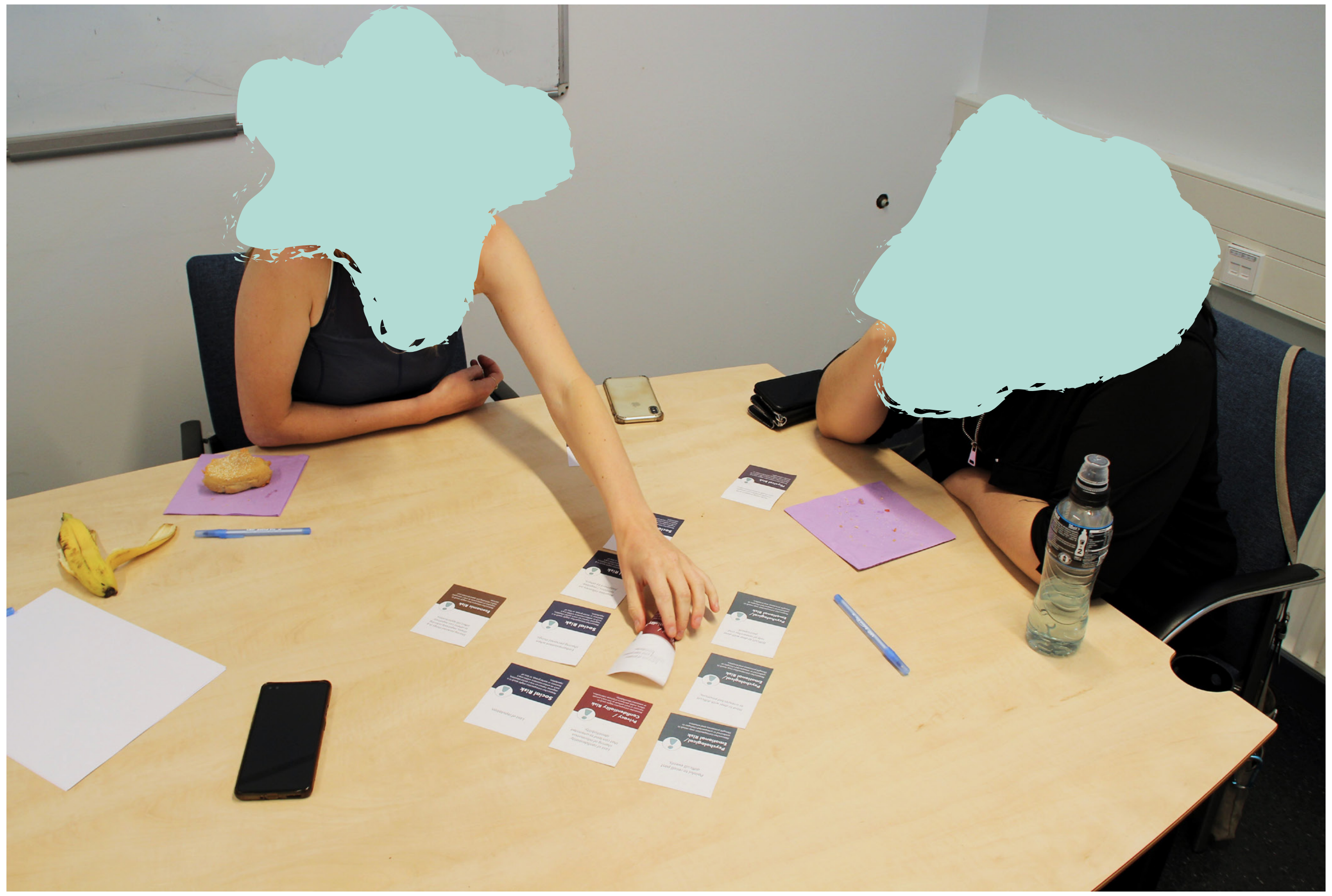

Figure 3.3 | *Discussing experienced risks during the focus group*

really mention anything about privacy or consent forms. I don't know if it was covered in the bachelor degree, but in the master's it was suddenly like: Oh consent form? You don't apply for these things for an elective class. So you don't think about it at all, until you have to do your thesis. And it's like: oh there are procedures you have to follow." - Student 1

The participants agreed that, depending on where you followed your education, you might not have had any experience with ethical procedures at all. This means that if students want to do introspective research for their graduation project, they will barely have any experience with procedural ethics, let alone feel encouraged to craft their own ethical guidelines.

2. Not considering risks before the study

The three participants agreed on the fact that they had **not really considered potential risks before their introspective study**. In case of the students who followed the introspective design course, they explained that following a course also puts you in a position where you just do what you're told to do for the course. One participant mentioned that they knew of the existence of some risks: *"I was vaguely aware of some risks because I read some papers about it"*- Student 1

Risks

1. Having an oversharing hangover

Two participants recognized **the feeling of "oversharing"** i.e. feelings of doubt or regret after sharing something personal during introspection. One participant compared it to oversharing personal details at a party: *"Sometimes when you are at a party, then you drink a little and you overshare with people and I can afterwards sometimes feel a bit like I have an oversharing hangover. Like, maybe I shouldn't have told people all this personal information. Maybe I could have objectified it a bit so that it's not so personal"*- Student 2

Furthermore, the participant mentioned that this oversharing hangover might also hit later, and that you should take that into account: "I can also imagine that during the project you're not that aware that this will be in a repository and this will not be taken off ever. So in 20 years, someone can look up your thesis and see it"- Student 2

2. Parameters for risk severity/weight

The participants mentioned that **the chosen topic and the length of the study** mattered much for how severe they would expect risks to be. A participant who had introspected about a beautiful family tradition explained that introspecting on this gave her a lot of good feelings, but this would have been different if the topic would have been, for example, grief.

3. Feeling of ownership

All participants had described friends or family members in their introspective accounts in some way. None of the participants had **asked for consent**. A participant then raised the question of ownership when it comes to sharing data of others: *"That [referring to others] is definitely I think a grey area in introspection. Because it also really feels like it yours, you know, because the anecdote is also mine. But you of course also use things of other people"*- Student 2

Opportunities

1. Fundamental Needs

The participants recognized multiple fundamental needs that introspection can fulfill. One of these is **comfort**, which they experienced during the introspective process. It is convenient and flexible to be able to research yourself rather than others: *"In my project now, i notice that just organizing participants, at the right time in the right space takes so much time"* - Student 3

Besides, participants recognize that the **need for competence** can be fulfilled by introspection because you are learning about yourself and about how to do this method. Furthermore, the participants recognize multiple benefits that come from publishing an introspective study: by relating to other people, there's a community and by designing for the community there's an impact, and it gives a purpose to the design.

Figure 3.4 | *Close up of the risk cards*

Design

1. Desired qualities

Finally, we discussed which qualities they would desire in a tool. First of all, they mention that they would like to become **more aware** of the potential risks. Besides, they would like to be able to work **alone and together** with others. Lastly, the tool should be “less excessive than HREC” at the TU Delft, and it should be **engaging**.

3.3 Researcher Interviews

3.3.1 Goal

The goal of researcher interviews was similar to that of the focus group study, i.e. to understand what risks and opportunities researchers have encountered in their introspective studies, how they have dealt with these, and what they need as introspective researchers.

3.3.2 Method

Participants

Two researchers with introspective experience in the field of design were recruited to participate in the interviews.

Procedure

This study was approved by the HREC committee. To sensitize the participants for the interview, they were sent three questions in advance: 1) What risks have you encountered during introspective research? 2) What risks have you thought about? 3) Wat benefits have you gained from introspective research?

The semi-structured qualitative interviews took 60 minutes, of which one was conducted in real life and one was conducted digitally. The interview consisted of the following components: 1) introduction of the project and the interviewer and interviewee, 2) signing informed consent, 3) open discovery questions, 4) questions on ethical risks, 5) questions on opportunities, 6) questions on design, and finally 7) a wrap-up.

To guide the discussion on the risks and fundamental needs, the materials as described in Chapter 3.1 were used.

The session was audio-recorded and transcribed. Data was processed using the statement card method as described by Sanders & Stappers (2020), as described for the focus group as well. The study was approved by the HREC committee.

3.3.3 Insights

Risks

1. Notable difference between students and experienced researchers of experienced risks and dealing with risks

Whereas students showed little awareness of risks and little experience with research ethics in general, **researchers were more aware and applied some preventative or mitigation strategies** during the introspective process. Examples are using fictionalized accounts, seeking support from others, and deliberately choosing what to share an what not.

2. Remember we are humans and not just researchers

One researcher mentioned that often times we just need to remember that we are humans and not just researchers. These ‘roles’ can get mixed up during introspective research, and can contribute to higher risk.

3. Topic and context

The researchers also stressed the importance of choosing a topic. A topic has a big influence on the weight of potential risks: *“I would place it times two or times three based on a certain “degree” that a topic has. Because I don’t think introspective research is necessarily always something that makes people feel*

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Figure 3.5 | *Researcher Interviews Plan*

uncomfortable. It really, really depends on what kind of topic we're talking about."- Researcher 1

Besides the topic, other contextual factors also play a large role in the weight of the risks. For example, referring to people in your research can be about referring to a general group of people, but also about referring to your mom or people who were your patients or participants. It is important to specify this.

4. Developing Mental Awareness

Through introspection, researchers can develop a certain mental awareness that can help them **actively decide when to introspect and when not**. For novice researchers, it might be harder to manage and make a deliberate choice: this time I will introspect and next time I don't.

Opportunities

1. Fundamental Needs

The researchers recognized that many of the Fundamental Needs were fulfilled, of which they also recognized **comfort and autonomy** as needs that can be fulfilled during the introspective process. Besides, they recognized **competence and fitness** as relating to each other, in terms of learning about yourself and developing mental strength:

"Introspection helped me to get out of the negative feeling, quite quickly. And transform into the curiosity of this experience itself, I noted down some of the insights. And that became a research process. It is not anymore like your trapped in the sad feeling and feel really bad all day." - Researcher 2

A more specific competence that they mentioned can be developed through introspection is **empathy**. Introspection is extremely valuable for a designer because it is a way to place yourself in other people's shoes, equipping you with inner world empathy.

Figure 3.6 | *Many of the 13 Fundamental Needs were fulfilled by using introspective methods*

Introspection could even contribute to **physical fitness** in a way. By working on your mind, introspecting on how you feel, it can have influence on the body. A researcher mentioned this relates to mindfulness practice.

More opportunities are that researchers think introspection can be a **beautiful experience** for yourself, because it is very personal and very moving. *"Well, people go to theatres to watch these kind of stories. I can imagine when the writer is writing this story, they are moving themselves first. And if you are moved, that is beautiful."*
- Researcher 2.

They also express that introspection can help to **relate to others**, by fitting into a community of other introspective researchers and by relating to other people through introspective accounts.

Design

1. Desired qualities in a tool

One researcher expressed that *"What would help me is even like a very small planning and thinking for myself, what may happen, how am I going to deal with that".* - Researcher 1

They elaborated it might be helpful to think in terms of the **risk dimensions** that we discussed. Identifying those categories can help researchers to think about their own situation.

The participants mentioned that some form of interaction/collaboration might be helpful, especially for researchers who are more new to this method. **Collaborating** might help them make commitments, a kind of agreement, and help each other understand and protect boundaries.

Furthermore, they would like to have something **engaging, that they not perceive as troublesome or too much extra work**.

3.4 Introspective Self Study

3.4.1 Goal
The goal of this study was to understand the risks and benefits of doing and publishing an introspective study from a personal perspective.

3.4.2 Method
A 7-day introspective self study was designed to gain personal experience with the method and its potential risks and opportunities. The topic of the study was how long distance communication with my boyfriend (B), while he is away traveling, affects the way I feel. Despite having researched and written about introspective research, I had no prior experience with using it as a method. Introspective data was collected using a "feedback" style diary (Turner et al., 2022; Carter & Mankoff, 2005). This includes daily diary prompts in the form of open ended questions to help me reflect on the events of that day with regard to the research topic.

The questions focused on what happened, what was said, and what emotions were raised. An orange folder containing the printed daily diary prompts, pens, and extra paper was placed next to my bed, serving as a visual cue to remind me to write at the end of each day.

The daily diary prompts were printed and kept in an orange folder, along with pens and sufficient additional paper, next to my bed, in order to serve as a visual reminder to log instances at the end of each day (see Figure X). See Appendix B for the list of diary prompts.

I approached this study with self-care in mind. I agreed with myself that if I encountered any emotional distress or difficulties during the process, I would prioritize my wellbeing by taking a break, or seeking support from others. The introspective data that was collected during this study was kept private because it is not part of the research goal.

To gather insights from this introspective self-study, 3 rounds of reflection were organized:
1. Reflect on the process
2. Reflect on the collected data
3. Letting B reflect on the collected data

3.4.3 Insights on the process
During my 7-day introspective self study, some unexpected insights and challenges emerged. Below, I reflect on this.

1. Choosing a topic

Starting this study, I immediately stumbled across the first hurdle: choosing a topic. I brainstormed about topics that to me felt somewhat vulnerable, ranging from mental health, to living situation, to relationship difficulties. For example, my mental health felt too personal to introspect on, even though my introspective data would be kept private.

2. Intrusiveness

I had decided to write in my diary at the end of each day, and then I would capture the communication and my feelings about that day. I had placed the daily diary prompts in a noticeable orange folder beside my bed, see Figure 3.7. Already at the first day, I noticed that writing while in bed felt quite intrusive to me. While writing, I automatically started thinking about more project-related matters, like how to process the insights. This felt intrusive. After a few days, I felt

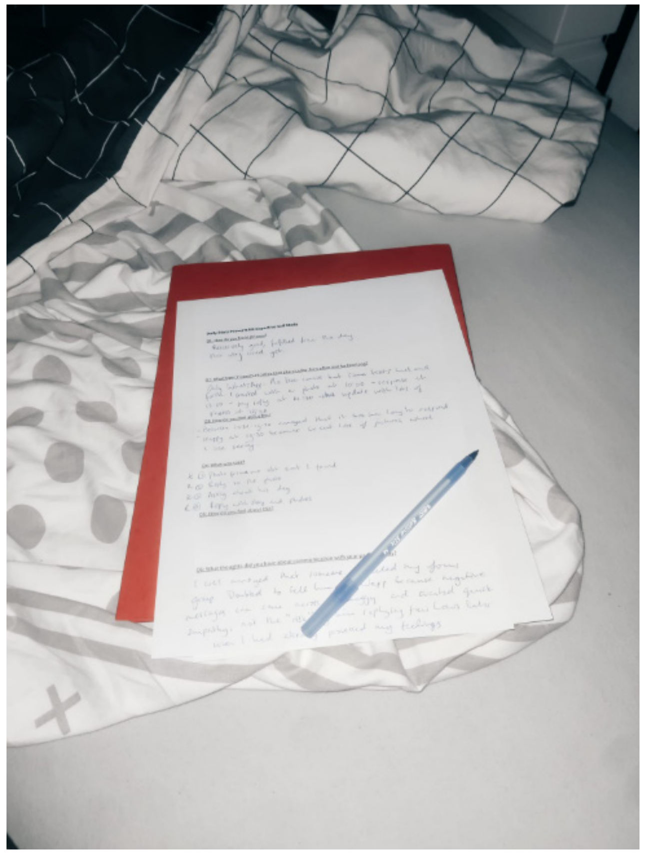


Figure 3.7 | *Keeping the diary map near my bed to write at night*

reluctant to do it. However, I had kept the same routine for the rest of the week, because "it was only for one week". In hindsight, I feel like I could have been more flexible with this. I think I might have as well chosen to introspect at a moment during daytime, and then introspect on the previous 24 hours. However, I felt like keeping the routine, and thereby performing the research more systematically, was more important than the possible negative effects.

3. Becoming hyper aware

I feel like writing about communication made me **hyper aware of our communication** that week. In a certain way, it made our communication less fun because because it did not feel completely unconstrained. This risk might be particularly relevant when doing concurrent introspection. More differences might be found between the temporal manners of introspection: concurrent, retrospective and imaginary.

4. Learning about myself

Through this introspective experience, I could see how this can teach researchers a lot about themselves. I had introspected on some difficulties in our communication, which I then realized had occurred in past relationships but which I had never seen as a pattern.

5. Writing about someone else

Lastly, I noticed my struggles with writing about B. To not influence how he would interact with me, I decided to not tell him I would introspect on our communication. **I wondered if that was unethical, but I justified it by reminding myself that this was all from MY perspective.** Looking into this, I found that different researchers have written about this, which is called ownership, or story ownership. It questions if people own a story simply because they are telling it (Thompson-Lee, 2017).

3.4.4 Insights on the collected data
After the 7 days, I typed up my introspective data in a document, where I also added a screenshot of the most remarkable thing in our communication that day. I then imagined this document as a thing that was about to be made public, and thus would be open for others to read. From this perspective, I first reflected on this document myself, and then asked B to reflect on it as well. The insights of these reflections are gathered below:

Reflection by me

1. Revealing negative experiences

Revealing my communication with B was fine and did not feel too personal when it came to pleasant communication. **However, when things got difficult, I found it much more difficult to reveal this.** Two times, I feel like I had acted disproportionately emotional. My main concerns with writing about this were that I felt embarrassed, and I was afraid of what others would think of it. I was afraid of loss of reputation. There was also a moment where I felt that B had been not communicative, after which we had an argument and he got emotional. When writing this in my diary, I felt a bit egoistic. Was I using his emotions to spice up my diary? Would B be OK with this? What soothed my sorrow is that I had already planned to let B read the diary, after which he can honestly state his opinion. It made me feel more free to write the things as I had experienced them, without worrying about censoring information.

2. Feeling that it does not belong to others
Besides my writings, I had also saved a screenshot each day of something remarkable in our written communication or something that could illustrate my introspective writings. This felt much more personal than my own introspective writings. When putting them in my document I already felt friction. **It wasn't so much embarrassment or being afraid of what others might think, but rather a feeling that it doesn't belong to others.** It was something between me and B, our shared property. When rereading my diary and seeing these screenshots, I felt that I wanted to take them out.

Reflection by B
To understand how B felt about my 7-day diary about our communication, I let him read the full diary after that week. I gave him time to read and think about the diary, before discussing it together. We then discussed how he felt about the following themes: 1) consent, 2) how he would feel if i were to publish the diary, 3) what risks he felt exposed to, 4) and what parts of the study he would want to hide. From our conversation, I gathered the following insights:

1. Based on trust
At first when I told him I had used our communication as my research topic, B mentioned he felt "weird".

"When I thought about it for longer I found it OK that you didn't tell me beforehand, because it makes sense, and because I trust you, and because I want to help you with your research. That's why I think it's fine." - B

He then mentioned he would trust me enough that I would not share too personal things, however, **he would want to read what I wrote before publishing and be able to explicitly give consent**. In other situations, where the researchers and referred to are not so close, this could cause issues.

2. Recognizing psychological/emotional, privacy/ confidentiality and social risks
I presented B the risk cards that I used during the focus group and researcher interviews. He recognized the following risks:
1. **Painful to be negatively represented**: B experienced this when reading the text.
2. **Privacy is intruded**: If I wouldn't ask B for consent before publishing this, he feels that his privacy would be intruded.
3. **Confidentiality risk**: B would worry about that people could identify him because they see my name as a researcher, and people he knows could link me to him. Being identifiable would make the following two social risks much worse:
4. **Feeling embarrassment for what is revealed of you**: B mentions that if I would let my parents read my research, that would add a social aspect. And then he would find it embarrassing if my parents would read it.
5. **Negative influence on relations / negative judgment from others**: B again mentions that he would worry about my parents reading my research, and them thinking differently about him than before.

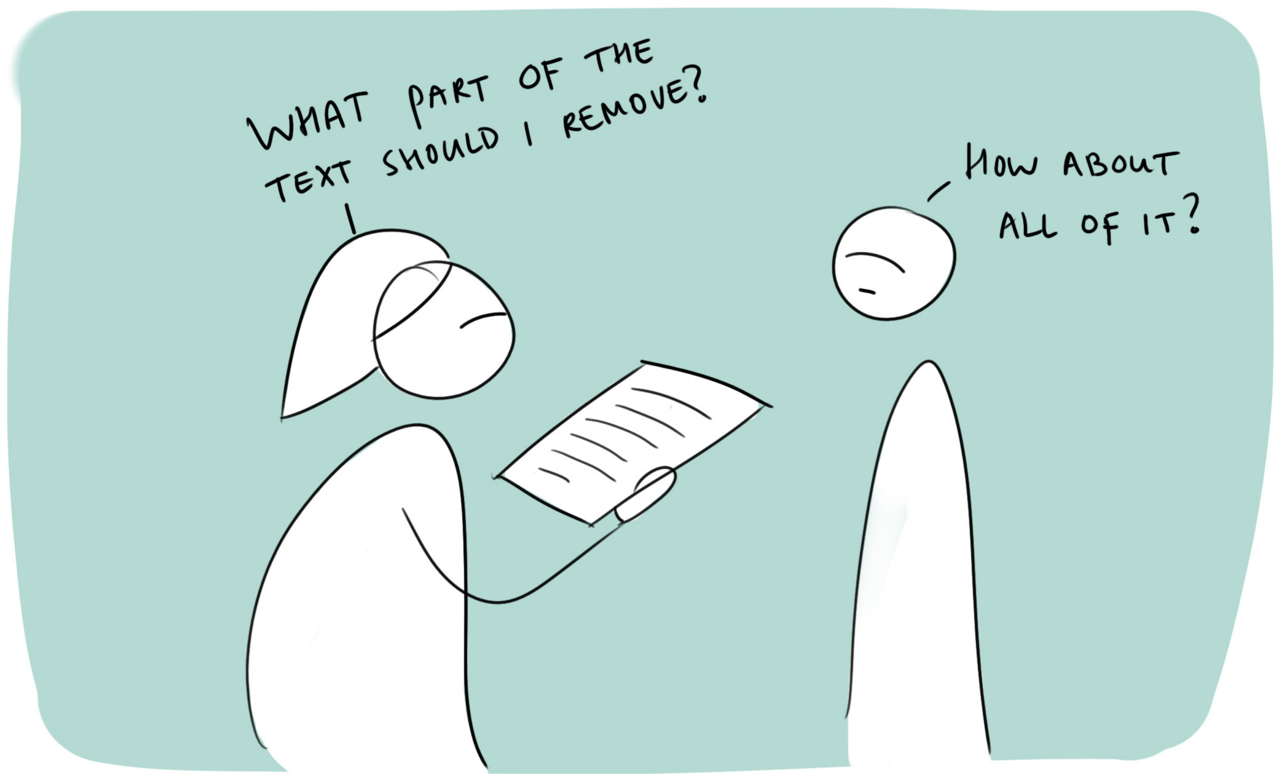


Figure 3.8 | *The difficulty of censorship*

3. It "feels" private
I first recognized this feeling myself, then I heard an interviewee mention it, and later B mentioned this too. This may be straightforward to some people, but privacy might be more of feeling than it is a rational boundary.

B mentioned that the negative interactions or experiences felt more private:
"I think it's in our nature to hold up a pretty picture towards others. In real life you would do that too, for example, you wouldn't want to argue out loud in public. And this wasn't really an argument, but we had a struggle, and I personally wouldn't share that publicly."
- B

4. Difficulty of censorship
When asking B what he wanted to have removed from the text, he mentioned there were not really specific parts of the text that could be removed. He expressed a difficulty with certain aspects of the diary that were rather induced throughout the text, that I had to initiate text or calls, or had to wait long for a response from

I expected that I would get some concrete feedback on the text, I would then rewrite it and mitigate B's pain points, and we would have a truthful yet not too personal story. However, **this made me realize that censoring a text would be much more difficult than I initially expected**.

5. Data type
Whereas I personally found screenshots of our conversations too intrusive, I learned that B thought differently about this. He said it was fine and "nice to reread them", and less privacy sensitive than my reflections. This means that the type of risk and its impact are dependent on **the way the data is collected**.

3.5 Expert Interview

3.5.1 Goal
The goal was to understand the institutional context of research ethics, and understand its relation to introspective research.

3.5.2 Method
Participant

One university researcher with expertise in design research methods was recruited.

Procedure

This study was approved by the HREC committee. The semi-structured qualitative interview took 45-60 minutes, and was conducted in person. Topics covered in the interview included: open discovery questions about their function and encounters with introspective research, questions about research ethics within institutional settings, questions about designing a tool.

3.5.3 Insights
Ethics rooted in practice

The participant stressed the importance of designing something rooted in practice.

1. HREC

HREC helps you with thinking through what kinds of potential harms there could be, and helps plan mitigations. So **if you don't go through HREC, there needs to be that measure still**. *"One of the nice things about HREC is the checklist I gave you is specifically for that. It's to sort of think through what kinds of potential harms there could be in planned in mitigations. So if you don't go through the HREC process, there needs to be that element still within the planning of introspection or any other method that doesn't require it, to give an example."* - Expert 1

2. Storytelling

Storytelling can be a powerful way getting people to relate to risks and opportunities. Even more so if it is weaved into the kind of thing that people are interested in.

3. Developing a sense of awareness

When gaining experience with introspection, **researchers might develop a sense of awareness of how far you're willing to go or how much you are willing to share**. However, this can be tough. Also because maybe the concept of privacy is changing in the world and for yourself.

Target group and Responsibility

1. Risks for students vs researchers

Some nuance can be found in the ethical practices for master students as opposed to researchers. For master students, there is usually quite a bit of **handholding** and freedom at the same time. They often do more small scale research, which gives smaller risk:

"So the handholding is sort of: well maybe you should do it like this, maybe you should stick to these things. But the freedom is sort: You can almost do whatever you want, but you do it on a very small scale. Often times. You don't have a survey that goes out to a 1000 people, you might survey 10 students or something like that. So there's really, it's a risk balance. Since you're doing it on a very small scale, there a low risk. So even the topic that could be more risky, you can still manoeuvre in that a little bit, usually."- Expert 1

2. Students and supervisors

Who is responsible for acting ethically? Ultimately, we as researchers are responsible for the research we do. But we do it within an organization. There should be some support network. As for students, they are still somewhat responsible but **supervisors are partially responsible as well**. There's a slight push of trying to get master students as the masters of their own work, but that's so much to ask for.

3.5.4 Three pieces of advice
Finally, I asked if this expert could give 3 pieces of advice to introspective researchers who want to do introspection in a responsible way. The following advice was given:

1) Ask yourself: Do you want people to still read about it in 15 years?

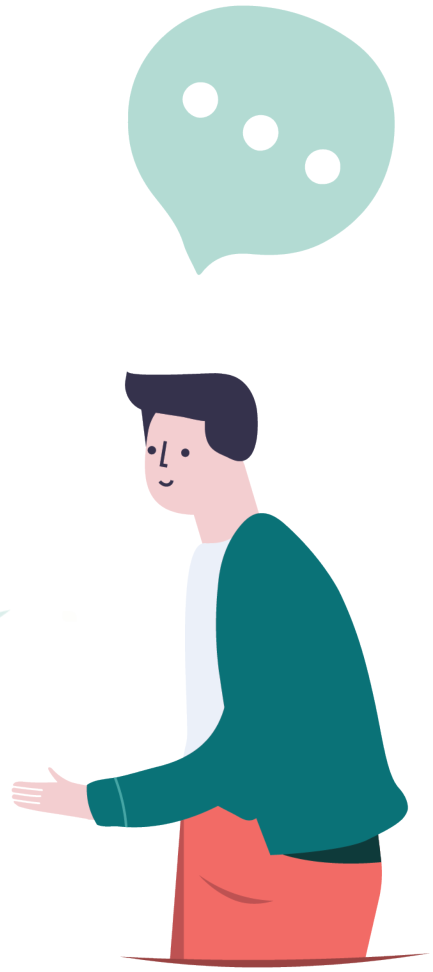
"I think for any kind of research and maybe particular for this kind of method, one of the target questions I might ask at the start: When you plan out your study, do you want people to still read about it in 15 years or something like that? That starts getting a little bit to the question of how much you are willing to reveal, or even what kinds of questions you want to ask." - Expert 1

2) Sensitize yourself before doing research.

"One main thing to start would be to sensitize oneself to what it actually means. Some kind of preliminary activity. Maybe not even on the topic that you want to study later on. But just to get a sense of what this involves and how it affects you. I don't know what that looks like. But I imagine if there's a textbook, it should be sort of a simulation or something like that." - Expert 1

3) Discuss your project with people who are knowledgeable in the method and/or topic you are studying.

The third piece of advice is to discuss your project with people who are knowledgeable in the method and/or topic you are studying.



3.6 Doing an HREC Application

3.6.1 Goal

The goal was to understand the current ethical procedures within the faculty of Industrial Design Engineering at TU Delft from within, and understand its relation to introspective research.

3.6.2 Method

Procedure

To receive ethical approval for the empirical studies that I have planned for this graduation project, I'm going to submit an HREC application following the TU Delft way of working. This process consists of the steps as described in literature research Figure 2.4. I planned a retrospective reflection moment to see if I could gain some insights from this procedure

3.6.3 Key findings

From my personal experience with submitting an application to HREC, I formulated a few general observations about this process, as well as observations related to introspection.

General observations

1) **Finding out how to do the ethical procedure was rather complicated**. Multiple documents had to be completed, for which I had to consult different websites and get approval on the separate documents from different people. This is inconvenient for researchers like me who only need to do some low risk empirical research. I completely understood why researchers would choose introspection purely to avoid this type of procedure. Furthermore, when you are doing a relatively short project, this procedure literally just takes too long. When designing something myself, I aim to make a more time-efficient tool, that researchers might spend longer or short on depending on their needs.
2) The HREC approval process **felt more like a formality** than that it was really helpful (because I was doing a low risk research).
3) It consisted of **lots of text**, which somewhat discouraged me. When designing something myself, I might want to minimize the amount of text.

Observation with introspection in mind:

1) The **wellbeing of the researcher themselves is not mentioned**, only external participants are mentioned.
2) **Different parts of the HREC Checklist are not applicable** to introspective researchers who are the sole participants, see Figure 3.9.
2) Ethical procedures are aimed at all TU Delft students and researchers and are **very generalized**. This means also no distinction is made between quantitative and qualitative procedures.
3) A large part of the HREC approval procedure consists of **informed consent**, which is in many cases irrelevant when doing researcher-introspection.

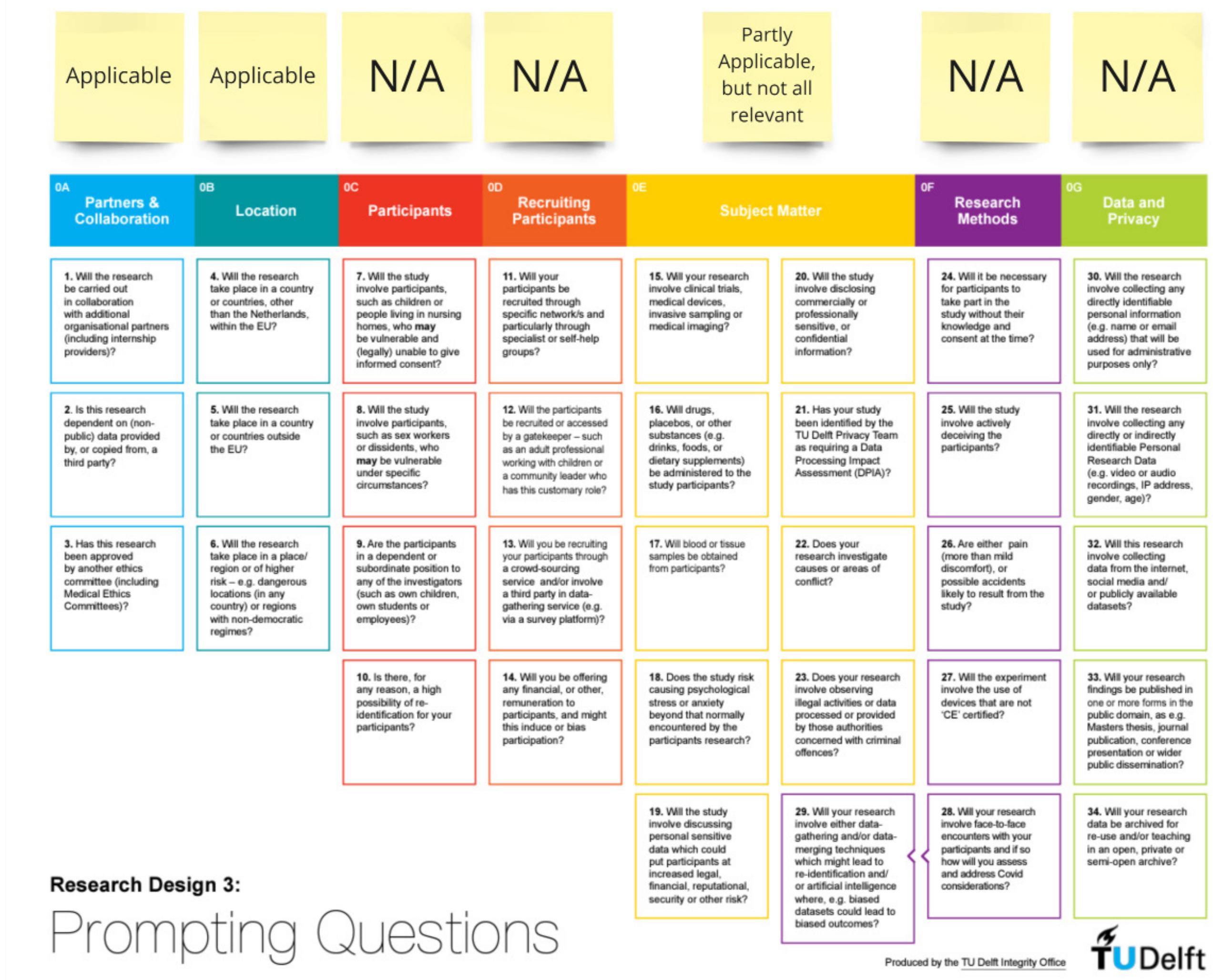


Figure 3.9 | *Prompting Questions as part of the TU Delft risk planning tool (TU Delft, n.d.-b)*

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3.7 Synthesis

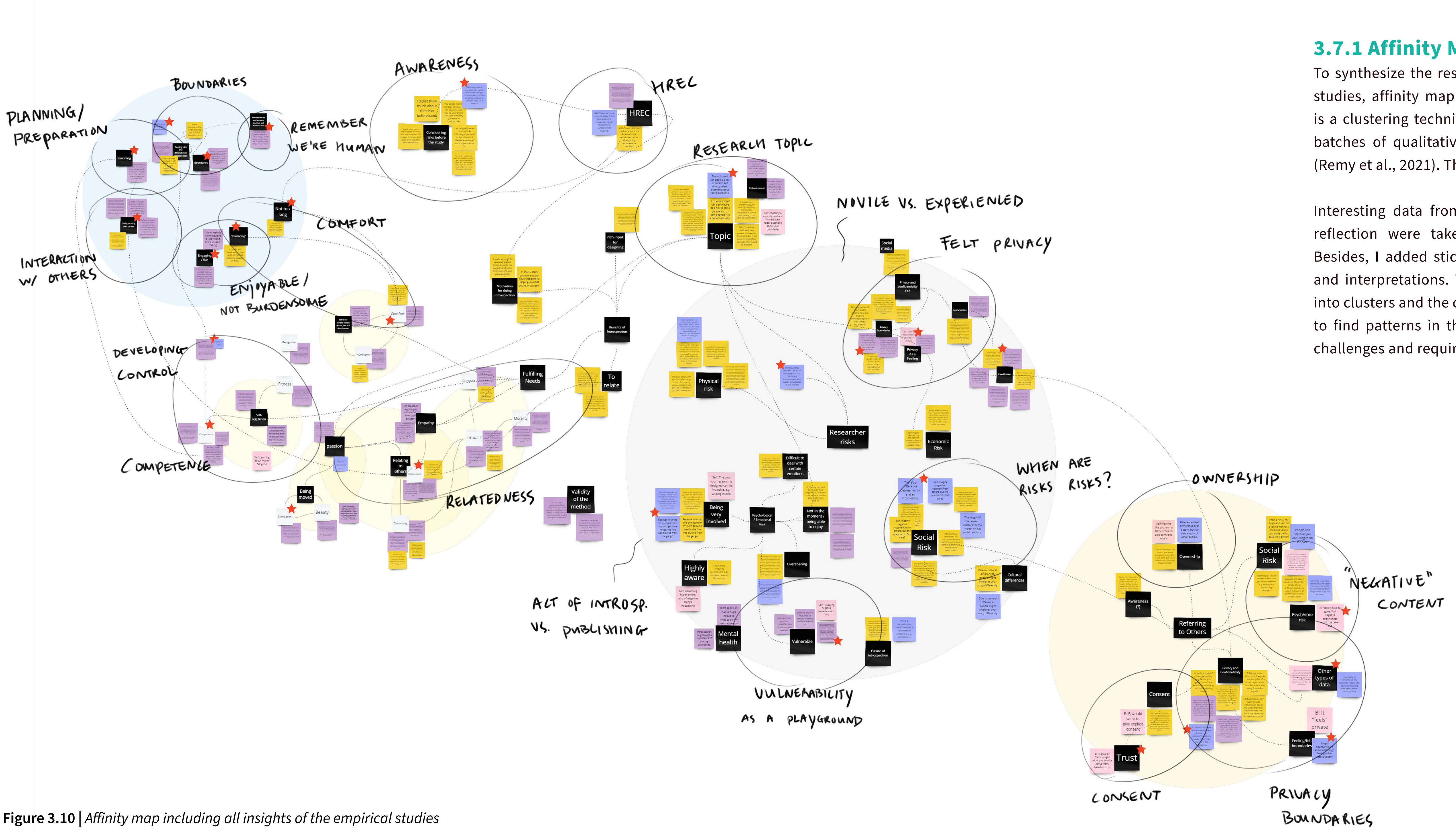

Figure 3.10 | *Affinity map including all insights of the empirical studies*

3.7.1 Affinity Mapping

To synthesize the results from the different empirical studies, affinity mapping was used. Affinity mapping is a clustering technique that helps to make sense of batches of qualitative data (Harboe & Huang, 2015) (Remy et al., 2021). The digital platform Miro was used.

Interesting data from the transcripts and self study reflection were taken and place on sticky notes. Besides, I added sticky notes with my own thoughts and interpretations. These data were then organized into clusters and the clusters were related. My goal was to find patterns in the data that would help identify challenges and requirements for the design process.

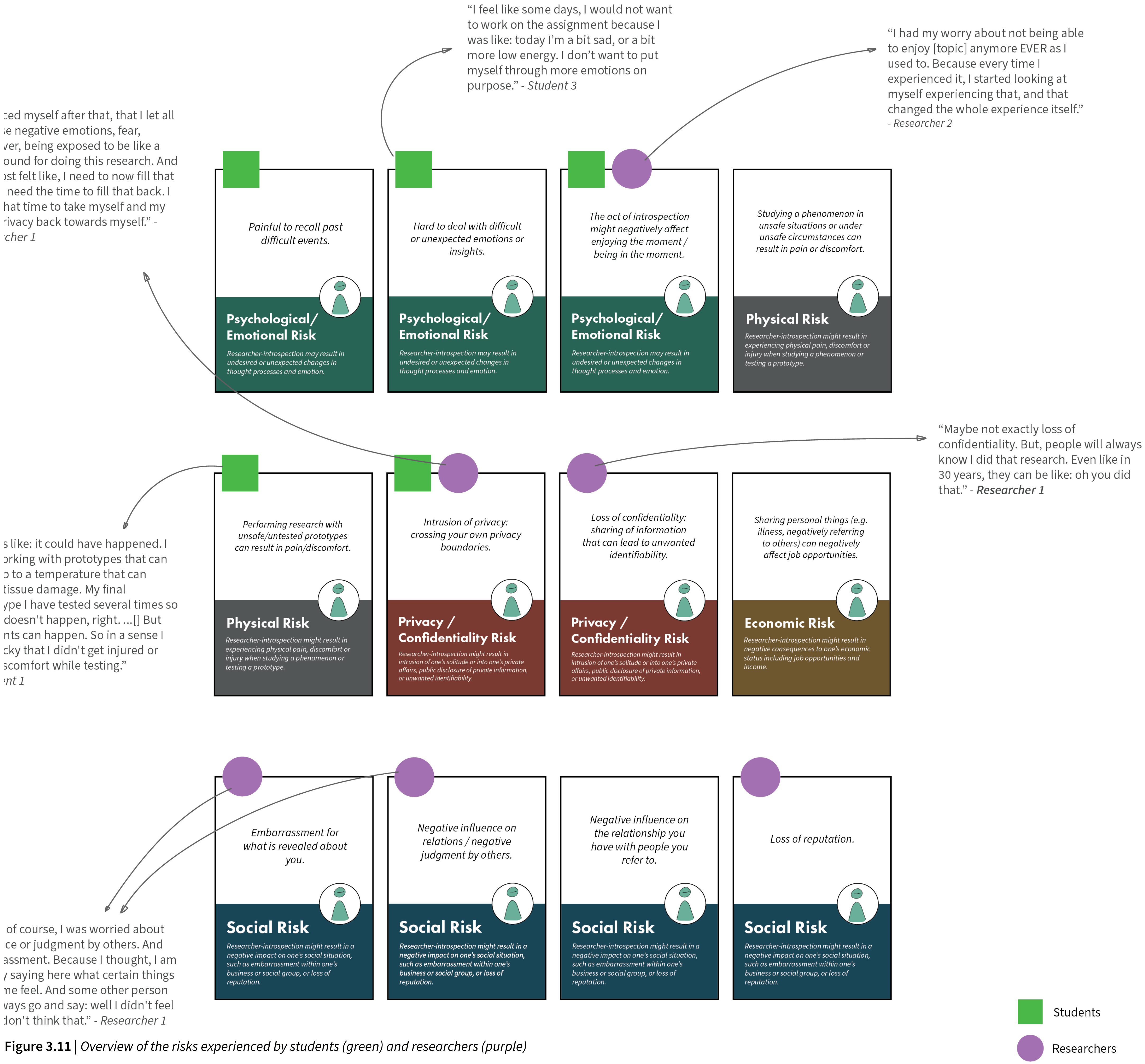

Figure 3.11 | *Overview of the risks experienced by students (green) and researchers (purple)*

3.7.2 Risk cards

During the focus group and researcher interviews, the participants were asked to indicate which risks they had experienced in their introspective project. ‘Experiencing’ in this context means noticing there was a potential risk, not necessarily experiencing harm from it.

In general, many risks were recognized by the participants. Some differences between students and researchers can be spotted when looking at the psychological/emotional risks (experienced more by students) and the social risks (experienced mainly by researchers). Some quotes from the focus group and interviews have been added to illustrate the findings.

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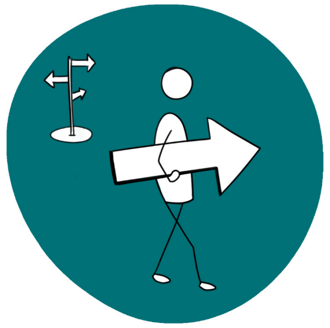
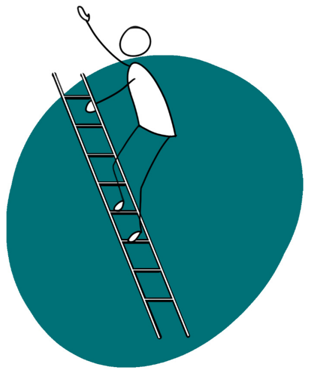
3.7.3 Opportunities

Based on findings of the empirical studies, I found that opportunities are very personal but can be divided in roughly 6 categories. Each category encompasses one or more opportunities, that are related to whether they fulfill one of the 13 Fundamental Needs.



A. The practical side of introspection

Introspection can have benefits in terms of *autonomy* and *comfort*. This method gives the researcher a 24/7 access to rich experiential data of their own experiences. This gives the researcher a certain freedom. Introspection can also be a convenient and therefore comfortable choice, because it is often quicker than organizing empirical studies with other participants.

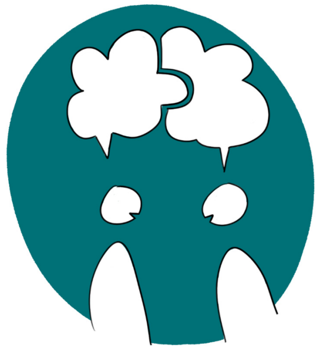


B. Introspection as self-regulation

Introspection can teach a researcher a lot about their inner selves. A researcher has to pay special attention to their inner states, which can teach them to manage themselves better and develop their *competences*. This also relates to fulfilling the need for *fitness*. Introspection can help strengthening the mind, and even have influence on the body.

C. The beauty of introspection

The act of introspection itself can fulfill the need for *beauty* and *stimulation*. Due to its highly personal nature, introspection can be a beautiful and moving experience. You live through it, it is very engaging, full of inner passion, and you will have a lot of very rich material to share.



D. Improved Relatedness

During an introspective research process, researchers have collected introspective data which they present through e.g. an article or artefact. Through these - often engaging and thought-provoking - artefacts, introspection can contribute to increased *relatedness* between you and your readers, as well as the *community* of introspective researchers. Besides, introspection can help you gain more understanding of others. It can be seen as a way to gain empathy.

E. Making an impact

When sharing or publishing your introspective account, you can make a positive *impact* on your readers about something you find *meaningful*. Furthermore, you can create a contribution to the design field in general.

F. Gaining Recognition

Sharing your introspective account can lead to positive *recognition* by others, or positively affect your position as a researcher.

Figure 3.12 | *The six identified opportunity categories*

3.8 Conclusion and Project Implications

Target Group
Through the empirical studies, differences have been discovered between students (novice researchers) and experienced researchers when it comes to the risks they have experienced and how they have dealt with those. Students expressed little awareness of risks and little experience with research ethics in general. The interviewed researchers, on the other hand, were more aware of risks during their research and they had actively applied risk strategies for prevention or mitigation. These included writing a fictionalized account, seeking support and deliberately choosing what to share and what not.

These findings show that there is an opportunity to design specifically for researchers who are new to using introspection as a method.

Risks
The different empirical studies showed that the act of introspection itself poses different risks than publishing or sharing research. This is a useful distinction that can help researchers consider risks during the different phases of their introspective study.

Besides, multiple participants had mentioned the influence of the project context (mostly the research topic) on both risks and opportunities. Therefore, when considering risks and opportunities, it is important that researchers can do this from their own project context.

Opportunities
Benefits are very personal, but can be roughly divided into six categories:
A. The practical side of introspection
B. Introspection as self-regulation
C. The Beauty of Introspection
D. Improved Relatedness
E. Making an Impact
F. Gaining Recognition

The categories can be useful for researches to help them think about opportunities in their own project. Seeing the range of potential opportunities might also encourage them to think about which ones they want to achieve or enhance.

Opportunities for change
To support researchers who are new to introspective methods, three main areas for improvement have been identified. First of all, students expressed little awareness and understanding of potential risks in general. Besides, it can be difficult for them to look ahead and consider risks and opportunities in their own project context. Furthermore, novice researchers logically lack experience in dealing with risks and opportunities in a research context.

Desired qualities for a tool
Participants expressed the following qualities when discussing desired qualities for a tool: first of all, the tool should be time-efficient (take less time than the HREC procedure). The tool should also be engaging, so that we feel motivated to use it. And the tool should be usable in an individual setting, as well as a collaborative setting.

4

Reframing

Based on the insights from literature research and empirical research, a new perspective on the problem has been formulated. This chapter starts with refining the problem (4.1), after which a new design goal (4.2), subgoals (4.3) and requirements (4.4) are set.

4.1 Refining the problem

During literature research, I have explored the topics of researcher-introspection, human research ethics, their intersection and relation to design, and gathered an overview of the current knowledge. Through empirical research (including interviews, focus group, self study, informal talks), I have gained an understanding of the experienced risks and benefits of introspection from multiple perspectives, user needs, other relevant requirements and context. These activities have contributed to a comprehensive understanding of the problem space.

With this foundation of knowledge, I have specified the design brief towards a meaningful, actionable design goal, a relevant user in a defined context and some concrete design requirements.

4.1.1 User

The focus groups and researcher interviews showed a notable difference between students (novice researchers) and experienced researchers regarding experienced risks and the way they dealt with risks. **Students showed little awareness** of potential risks and little experience with research ethics in general.

> *"During my introspection project, I was really not aware of any risks. I just thought: Oh fun, I put fun images of my family in the project. But now reflecting on it, I maybe should have been more aware."* - Student 2

Researchers, on the other hand, were more aware of risks that might happen and applied some preventative or mitigation strategies e.g. fictionalized account, seeking support, or deliberately choosing what to share and what not.

> *"I think I learned how to manage and how to make the choice: this time I will introspect and next time I don't. I just want to enjoy it. So you actually can develop that mental awareness and make the decision."* - Researcher 2

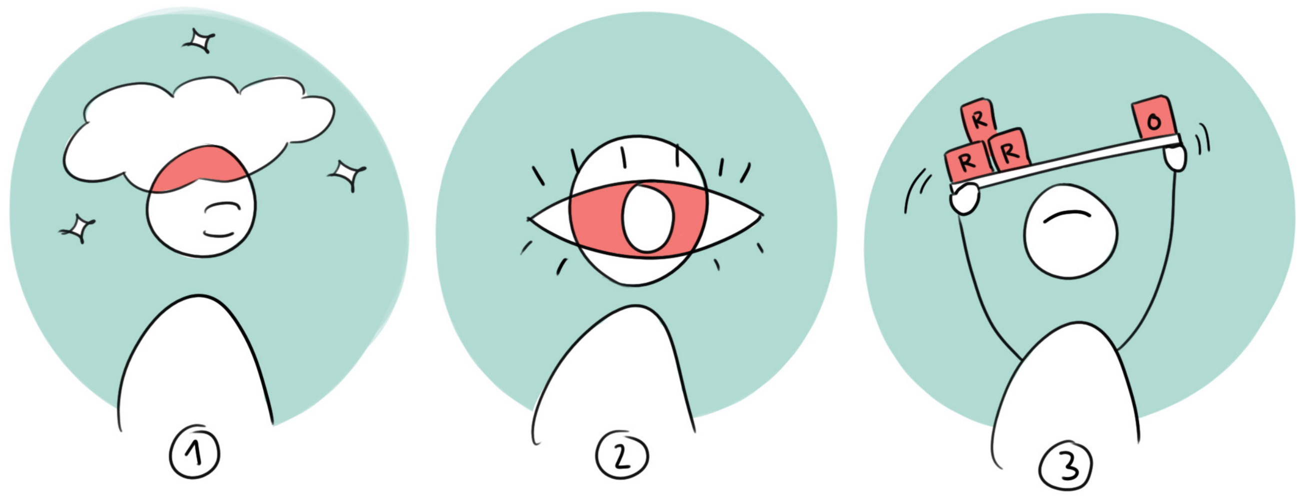


Figure 4.1 | *Three key problems*

Besides, the reflection in Chapter 2.3.5 discussed that ethical recommendations for introspective researchers are not easily accessible.

Combining these insights, this project will focus on designing for **designers/researchers who are new to using introspection as a method.**

4.1.2 Key problems

1. Little awareness and understanding of potential risks and opportunities related to introspective research

Designers who are new to using introspective research methodologies have little awareness of potential risks of these methods. This is not only due to being new to introspective research, but can also be due to being new to research ethics in general.

> *"I don't know if it was covered in the bachelor degree, but in the master's it was suddenly like: Oh, consent form? You don't apply for these things for an elective class. So you don't think about it at all, until you have to do your thesis. And it's like: oh, apparently there are procedures you have to follow."* - Student 1

2. Difficult to look ahead and identify potential risks in your specific project context

Lacking awareness of general risks in the first place, it is even harder to consider risks in your own specific project context. Risks that might happen are very personal, and therefore require not only knowledge on potential risks and project context, but also some knowledge about yourself and how you experience risks.

> *"I can also imagine that during the project you're not that aware that this will be in a repository and this will not be taken off ever. So in 20 years, someone can look up your thesis and see it. This is not really likely to happen but imagine you'll be the next Britney Spears..."* - Student 2

3. Little know-how on how to deal with risks (and opportunities)

To prevent harm from happening, it is important that researchers can plan and execute risk strategies. This can be difficult for researchers who are new to introspection due to their lack of experience, as well as the limited number of resources on introspective risks and their availability.

> *"When I was writing my report, my supervisors did comment that it would be good to take out certain information. And I was like, that's fair. But then it becomes a question: what information should be taken out?"* - Student 1

4.1.3 Context

The tool will be designed for use in an academic context. The development of this tool will be based on the context of research at the IDE Faculty at TU Delft. However, this specific context might be generalizable to a broader institutional research context.

4.1.4 Scope

The tool will...:

... Increase awareness and understanding of risks related to the researcher and those referred to in the study
... Increase awareness and understanding of opportunities related to the researcher
... Support the researcher to identify risks and opportunities in their own project context
... Support researchers in planning and executing risk strategies and opportunity strategies

What will the tool not...:

... Not address risks other than to the individual researcher or those referred to in the research
... Not address opportunities other than to the individual researcher
... Not undermine institutional ethical procedures. My tool should be considered additional and not substitutive.
... Not address topic consideration (but topic consideration might be affected by using this tool)
... Not offer specific advice for best practices in different cultures and geographies
... Not provide legal support

4.2 Design Goal

Research practitioners = researchers who are new to using introspection as a method

To design a tool intended to assist research practitioners engaged in introspective methodologies, in the identification and management of potential risks. This tool would encompass the safety considerations pertaining to themselves and their subjects. Simultaneously, this tool would facilitate the optimization of potential opportunities that introspective study presents, thereby maintaining an effective equilibrium between risk management and opportunity exploitation.

Their subjects = the people that are referred to in an introspective account

4.3 Design Subgoals

Based on the refined problem and design goal, the 3 following design subgoals have been formulated.

1. Increasing awareness and understanding

The first subgoal is to increase awareness of potential risks and opportunities related to introspective research, including:
- Potential risks to the researcher themselves
- Potential risks to those referred to in the research
- Potential opportunities to the researcher themselves

2. Encouraging to look ahead

Once researchers are aware of the risks and opportunities that are common in introspective research, they should be encouraged to identify potential risks and opportunities in their own project context.

3. Facilitating risk and opportunity management strategies

The last subgoal is all about action. The design should offer guidance for researchers to plan and execute risk prevention and mitigation strategies, as well as optimize the opportunities. The tool should help researchers maintain a balance between risk management and opportunity optimization.

4.5 Design Requirements

Based on literature research and user needs, seven design requirements have been defined that can be seen as starting points for reaching the design goal and three subgoals.

☐ 1. **Risk Awareness**: The tool should educate researchers about the potential ethical risks involved in introspective studies, including those that may impact the wellbeing of both the researcher and those referred to in the study.

☐ 2. **Risk Strategies**: The tool should offer practical guidance and resources for researchers to implement risk management strategies that prioritize researcher wellbeing.

☐ 3. **Opportunity Optimization**: The tool should provide guidance on how researchers can maximize the opportunities within introspective studies with relation to the six identified opportunity categories.

☐ 4. **Reflexivity and Self-Reflection**: The tool should encourage researchers to engage in critical/continuous self-reflection and reflexivity throughout the research process, specifically addressing the impact on their own wellbeing.

☐ 5. **Engaging/Inviting**: The tool should be engaging and inviting, so that researchers feel motivated to use the tool throughout their introspective research journey. It should be relatively simple, an enjoyable to do.

☐ 6. **Time-efficient**: The tool should be designed to be time-efficient, ensuring that it does not impose excessive time burdens on the researcher. It should allow researchers to efficiently navigate and utilize its features. By reducing time requirements, researchers are more likely to engage with the tool and incorporate it into their research process.

☐ 7. **Facilitate individual use as well as collaborative use**: The empirical studies that researchers find it convenient if they can use a tool by themselves, but also that collaboration with others can provide valuable support. Therefore, the tool should be suitable for individual use, as well as collaborative use.

4.6 Conclusion and Project Implications

This reframing phase has yielded several key takeaways and implications for next phases of the project:

Refinement of the Problem
The refinement of the problem has highlighted three critical problems that researchers who are new to introspective methods face: a lack of awareness, difficulty in looking ahead, and challenges in dealing with risks. Having defined a new user, key problems, context and scope, a sharper focus has been given to the project.

Design Goal
Based on the refinement of the problem, a new design goal has been formulated that reflects the commitment to empowering researchers with the necessary means to engage in responsible introspective research: "*To design a tool intended to assist research practitioners engaged in introspective methodologies, in the identification and management of potential risks. This tool would encompass the safety considerations pertaining to themselves and their subjects. Simultaneously, this tool would facilitate the optimization of potential opportunities that introspective study presents, thereby maintaining an effective equilibrium between risk management and opportunity exploitation.*"

Three Subgoals
The three subgoals, each aligned with a key problem identified during the refinement of the problem, provide clear and actionable directions for this project. By 1) increasing awareness and understanding; 2) encouraging researchers to look ahead; and 3) facilitating risk and opportunity management strategies, the challenges faced by researchers are directly addressing.

Seven Design Requirements
The seven design requirements outlined in this phase serve as foundational building blocks for achieving the design goal and subgoals. These requirements - including risk awareness, risk strategies, opportunity optimization, reflexivity & self-reflection, engaging, time-efficient, and individual an collaborative use - respond directly to the needs and challenges of the target group.

In conclusion, the reframing of the project has set a clear direction and boundaries for the design phase.

5

Design Exploration

This chapter presents ideating and prototyping explorations. Using the design subgoals, I formulated 3 How-Might-We questions as starting points for ideation. Three main approaches to ideation are followed to come up with a wide range of ideas: Face-to-face brainstorming in groups (5.2), Individual idea generation sessions (5.3-5.5), and Computer-mediated ideation (5.6). Based on these sessions, 5 concepts are selected and transformed into prototypes. These prototypes were then tested during a roleplaying session (5.7), leading to three key ingredients for a final concept.

5.1 Approach

5.1.1 Approach

Starting the design phase, I entered the phase of messy, iterative idea generation. My goal was to come up with a broad set of ideas which were then evaluated and built upon iteratively. To work effectively, I transformed the 3 subgoals as defined in the previous chapter into How-Might-We (HMW) questions, which serve as starting points for ideation:

1. Increase awareness: How might we increase awareness of potential risks and opportunities related to introspective research?
2. Encourage to look ahead: How might we encourage researchers to look ahead and consider potential risks and opportunities in their own project context?
3. Facilitate risk prevention and mitigation, and opportunity optimization: How might we facilitate risk prevention/mitigation and opportunity optimization throughout the process, maintaining a balance between risks and opportunities?

Three different ideation approaches were followed, as proposed by Faste et al. (2013):
(1) Face-to-face brainstorming in groups;
(2) Individual idea generation sessions;
(3) Computer-mediated ideation.

Each approach provided room for applying different ideation techniques, which is described on the next few pages.

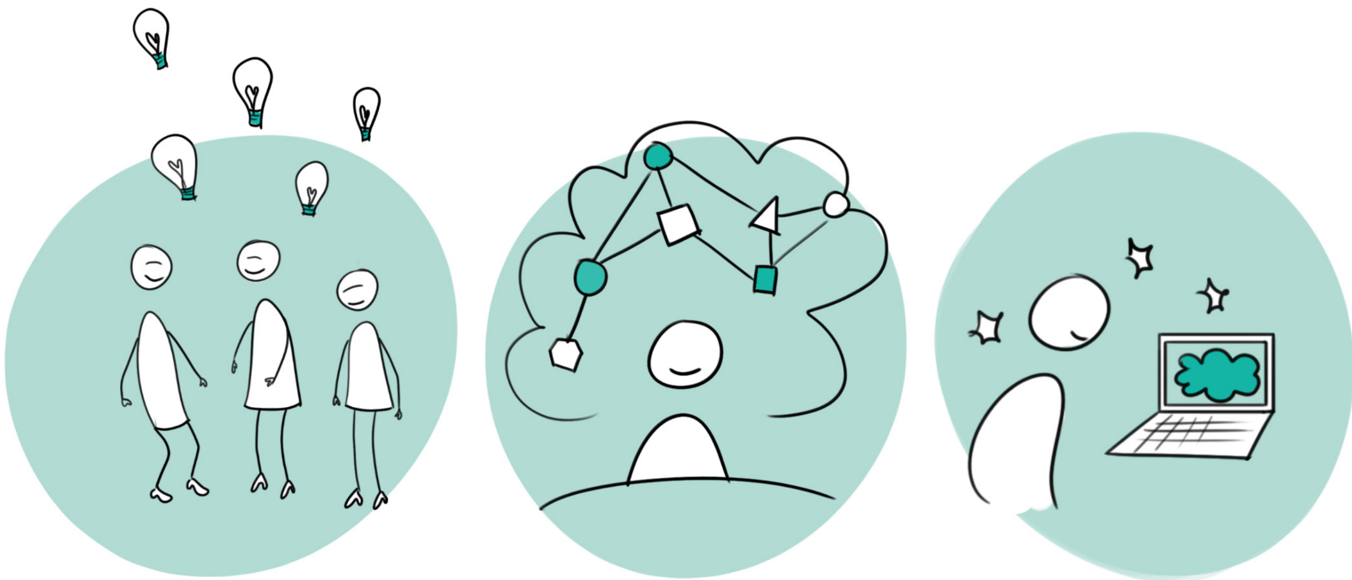


Figure 5.1 | *Group, individual and computer-mediated ideation*

5.2 Face-to-face brainstorming in a group

5.2.1 Goal
The goal of this first brainstorm was to generate a broad set of ideas, and build upon each other's ideas collaboratively.

5.2.2 Method: Brainstorming and chainstorming
Participants
Two master students of the IDE Faculty of Delft University of Technology were recruited to participate in this session, and I participated in this session too.

Procedure
The participants were first introduced to the research by explaining the design goal and process so far. To organize their thoughts and prior knowledge about the topic, participants were asked to make a mindmap individually before we started with brainstorming (see Figure 5.2).

Using post-its, pens and a blank wall, we then engaged in Google's Crazy 8, which is a brainstorm game where you have 8 minutes to come up with 8 distinct ideas (Google, n.d.). This was done for each of the 3 HMW-questions.

Afterwards, there was room for discussion. We looked at the ideas of the other participants to see what triggered us or what was still unclear. We then collaboratively engaged in Chainstorming: building on each other's ideas by taking them a step further or writing down a related idea that pops up (Faste et al., 2013).

Going through all ideas, we then highlighted our favorites. These are elaborated on in the insights section.

5.2.3 Insights
For each HMW-question, 2-3 favorite ideas were selected. These are explained below, along with insights gathered from this.

Figure 5.2 | *Starting with mindmapping to organize thoughts and prior knowledge*

Figure 5.3 | *Using yellow post-its to build on the earlier generated ideas*

Figure 5.4 | *Generating ideas for each of the HMW-questions*

HMW#1: Creating awareness and understanding

1. Guide on How NOT to do introspection:
Based on the idea of a horror movie titled "Research gone wrong!", a participant came up with idea of a guide for researchers on how not to do introspection. Rather than really scaring researchers off through a horror movie, the guide would approach doing introspective research from a playful/funny angle.

2. Risk and opportunity cards
Creating cards that are visual and simple, and that show the variety of risks and opportunities. The cards could be used in a game-like format, think of quartet or memory.

HMW#2: Encouraging to look ahead

1. Glasses that show different perspectives
This idea was originally brainstormed for HMW#1, but when chainstorming we agreed that it would be a good fit for HMW#2. To look ahead and consider risks and benefits in your own project context, one participant came up with the idea of designing different pairs of glasses that encourage you to consider a situation from different perspectives.

2. Prompt grab bag
To encourage researchers to look ahead, researchers should be asked the right questions. One participant came up with a prompt grab bag, containing multiple relevant prompts to help you reflect.

3. Roleplaying Dungeons & Dragons style
To look ahead, researchers could engage in roleplaying scenarios equivalent to the game Dungeons & Dragons. Dice rolling could signify the chance of risks/benefits happening, a dungeon master might be an expert in introspection. A game like this might help explore scenarios on your own project context.

HMW#3: Facilitating risk mitigation and opportunity optimization
Discussing this question, we noticed that our ideas varied a lot. We discussed that it was not so clear if we had to come up with actual mitigation and optimization strategies, or rather a platform or tool that incorporates existing strategies. Overall, this question was the most vague and requires some extra attention in the following ideation activities.

1. List of strategies and planning template
To help researcher mitigate risks and optimize opportunities, they might be provided with a list of mitigation/

optimization exercises. Additionally, a planning template could help them determine what strategy to apply and when.

2. Tangible risks and opportunities

Making a set of open ended objects, researchers could appoint these as risks or opportunities, and rank/order them in a physical space. They might even place them on a physical scale/balance, as to help them rank/weigh risks and create an equilibrium.

Miscellaneous

This session has also helped me get a better understanding of the 3 subgoals. Some common trends could be found within the ideas generated per question. I learned that for creating awareness and understanding, storytelling is very important. This returned in many of the ideas that the participants came up with. For encouraging people to look ahead, ideas involved roleplaying scenarios, prompts that make you consider scenarios, or a tool that make you see scenarios differently. For facilitating risk and opportunity management, researchers should either be provided with concrete management strategies (which might be difficult because the "right" strategy is context dependent) or be encouraged to think about their own strategies.

5.3 Individual Idea Generation #1

Mindmapping ideas throughout the process

5.3.1 Goal

The goal was to select relevant ideas from the bunch of ideas that was generated before entering the design phase.

5.3.2 Method

Many articles, conversations and people I have encountered during the process so far have triggered interesting thoughts or ideas directly related to designing a tool. All of these ideas were sparked before reframing the project brief, therefore some might have lost their relevance. In Figure 5.5, I have depicted the overview of things that have sparked my interest during the process. I shortly elaborate on the ones that are still relevant with regard to my design goal.

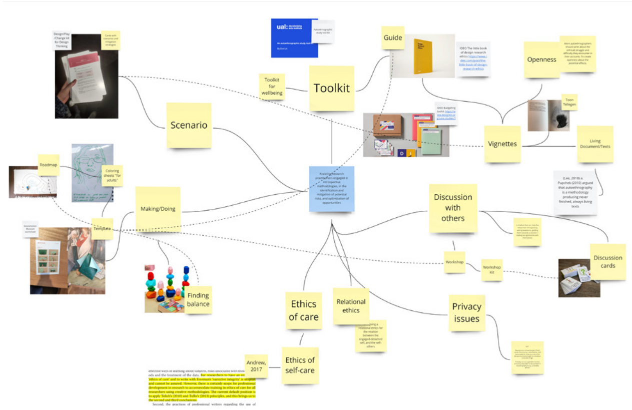


Figure 5.5 | *Keeping track of ideas throughout the process*

5.3.3 Insights

1. Creating vignettes

One idea that was inspired by a discussion with my supervisors is to create vignettes. Vignettes are short, impressionistic scenes that give insight into a particular character, idea, or setting. They might **help researchers to relate to risks and opportunities**. They could be presented in e.g. a book or on cards.

2. Ideas on making/doing

Multiple ideas were generated related to the researcher **making or doing something actively to manage risks and opportunities**. Not just presenting theory, but learning by doing. Researchers might be supported to plan and execute risk strategies when they are provided templates, which could also go in the direction of coloring sheets or filling in a roadmap. Researchers might thus be supported through a *workbook with templates*. They could also be provided with a *workshop package*, containing templates as well as a facilitator guide, so that they can engage in risk management together with others. Another idea is to design a *wellbeing toolki*t, containing different tools and resources for self-care, which could serve as a reminder to focus on wellbeing.

5.4 Individual Idea Generation #2

Random Word Association

5.4.1 Goal
The goal of this ideation session was to generate new ideas by coming up with unexpected words and concepts.

5.4.2 Method
This ideation method was inspired by the 'brutethinking' method as proposed by Michalko (2007). The following steps were executed:

Step 1: Random words were selected using an online word generator (https://randomwordgenerator.com/). Words had to be completely random and unrelated to my project.

Step 2: I then thought of as many associations I have with the word as possible and wrote them down within a time limit of 30 minutes. I used the following guiding questions: What are its characteristics? What does it do? What can we do with it? Where is it used?

Step 3: Connections were forced between the random word and my design goal, using the characteristics identified in the previous step.

Step 4: All ideas were written down.

This process was repeated 3 times, using the words 'platform', 'combine' and 'wheel'.

5.4.3 Insights
1. Reflection Journal

Going from platform to *sea* to *water* to *reflects*, I found that a connection could be made to my design goal. The concept of **a reflection journal in which researchers might keep track of their introspective data collection**, and which also contains exercises and tips on risk mitigation and opportunity optimization.

2. Navigation for researchers

Going from *combine* to *choice* to *direction* to *Google Maps*, a connection could be made to my design goal. The idea is to design a navigation, **helping researchers determine the speed, direction and goal of their research while avoiding obstacles (risks)**. To navigate, researchers could use a map with different physical layers to build upon each other.

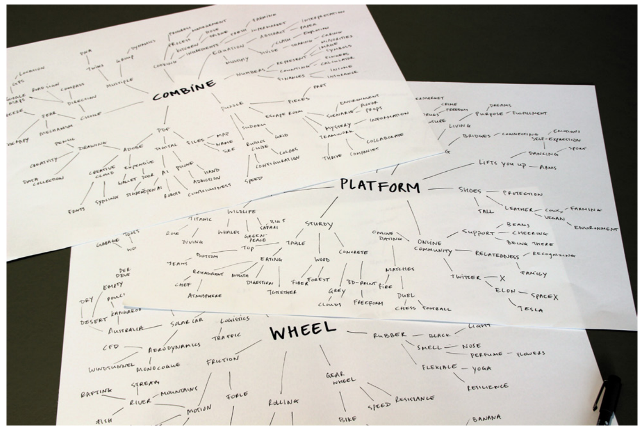


Figure 5.6 | *Outcomes of the Random Word Association exercise*

5.5 Individual Idea Generation #3

Mapping Extremes

5.5.1 Goal
The goal of this ideation technique was to consider extreme ways of risk prevention and mitigation in scientific research in order to come up with extreme equivalents for introspective research.

5.5.2 Method
Extreme risk mitigation strategies were searched online. By looking at the different qualities (functionality, form, and user-interaction features) of these extremes, and relating them to introspective research, the goal was to come up with new ideas for tools that could be useful in the context of doing introspective research. The following 4 extremes were considered:
1. Doing nothing
2. Serious and analytical (FMEA)
3. Making it "fun" (Gamified risk mitigation)
4. Keeping it simple (Risk assessment for kids)

5.5.3 Insights
The results of this ideation session can be found in Appendix D. Doing this ideation exercise did not leverage concrete new design ideas. However, it did give me insight into the balance between energy/time and risk mitigation, resulting in a graph (see Figure 5.7). Whereas FMEA might help researchers identify risks very thoroughly, it also takes much more time than the other tools. To save time and energy, one might opt for playing a game of Jenga using additional prompts. This, however, will likely result in less detailed and thorough risk identification and mitigation.

From my empirical research, I learned that students/researchers find it important the tool does not take up too much of their time and energy. Therefore, it is desirable that the tool is in the A or D quadrant of the graph, or perhaps even just the A quadrant.

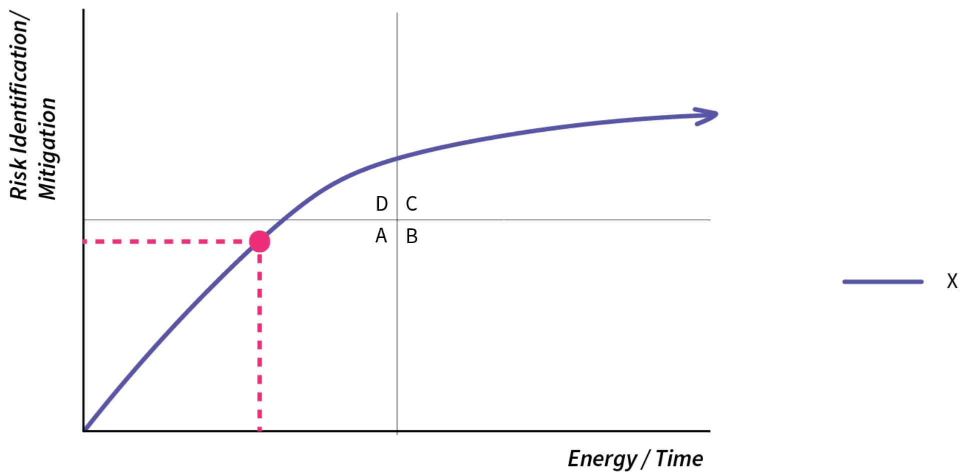


Figure 5.7 | *Graph showing the estimated balance between risk identification/mitigation and energy/time spent*

5.6 Computer-Mediated Ideation

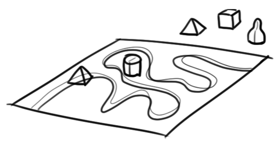
Collecting Heuristics

5.6.1 Five concepts

From the group and individual brainstorm methods, five ideas for design concepts were selected that aligned with one or more subgoals and that have potential to fulfill the design requirements.

1. Introspective Research Ethics Storybook or Cards

An illustrated storybook that presents ethical dilemmas and risk management strategies in a narrative format suitable for beginners. The stories feature relatable characters and design-relevant scenarios that introduce research ethics and decision-making.

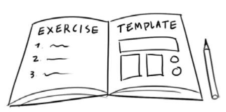


2. Process Planning Board

A physical board that helps researchers to plan and execute risk and opportunity management throughout the process. Physical props can help to concretize risks and opportunities and position them, helping them to manoeuvre through the project. It can also help make sense of situations through embodied sensemaking.

3. Research Ethics Game

Developing an interactive board or card game that guides researchers through different research scenarios including different risks and opportunities, inspired by a Dungeons & Dragons style of roleplaying. By creating your own imaginary stories, you can explore the possible outcomes of your research and become aware of risks and possibilities as well as management strategies.



4. Reflection Journal

A journal specifically for introspective researchers to support self-reflection. It might include relevant prompts, ethical considerations and planning related to their project. It also serves as a way to track the researcher's insights throughout their introspective research journey.

5. Short audio stories on introspective risks + reflection template

Short audio stories on introspective risks and opportunities, allowing the researchers to engage with the content while walking, traveling, etc. To reflect on the audio stories and identify risks and opportunities in their own context, a reflection template is provided.

5.6.2 Goal

The goal was to explore new variations or transformations of the five concepts, by generating design heuristics using ChatGPT and applying them accordingly.

5.6.3 Method

Design heuristics

Heuristics are 'mental shortcuts' that are common in human reasoning. They capture important features of problem situations and solutions that reoccur in experience.

Yilmaz et al. (2016) analyze design evidence from four empirical studies of design process and outcomes to find patterns. The patterns they found are then presented through 77 Design Heuristics that catalog how designers appear to introduce intentional variations into their conceptual product designs. To come up with design heuristics that are relevant to the field of designing for risk identification and mitigation, without having to spend months on acquiring and analyzing design evidence, I consulted ChatGPT (an AI-powered language model developed by OpenAI).

After experimenting a bit with the exact framing of my question, I landed on the following input question to ask ChatGPT: *"Hi there! Could you please come up with a list of 10 design heuristics based on design evidence from the field of tools for identifying and mitigating ethical risks? The design heuristics should address either functionality, form, or user-interaction features"*. Important to mention is that ChatGPT generated responses based on a mixture of licensed data, data created by human trainers, and publicly available data. However, it does not have access to specific design evidence from the field of 'tools for identifying and mitigating ethical risks' or real-time research findings.

For the full list of generated heuristics, check Appendix C. From this list, I selected 5 heuristics that are most relevant for my project.

1. User-Centered Interface // User-interaction: Provide step-by-step guidance and interactive prompts to assist users in addressing specific ethical considerations.

2. Risk Assessment and Mitigation Support // Form: Offer decision trees, flowcharts, or risk matrices to help users navigate complex ethical dilemmas.

3. Comprehensive Ethical Framework // User-Interaction: Enable users to customize the tool's parameters based on their specific research context and needs.

4. Real-Time Ethical Feedback // User-Interaction: Encourage users to record reflections and considerations as they progress through the research process.

5. Collaboration and Consultation Features // Functionality: Facilitate collaboration and consultation among researchers, ethics committees, and stakeholders directly within the tool.

Procedure

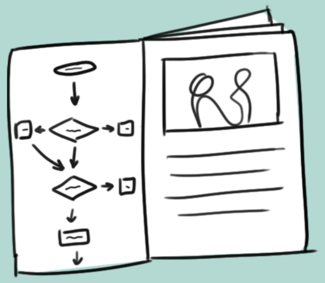
First, the ideas from group and individual ideation sessions were evaluated and brought down to 5 concepts. Then, ChatGPT was asked to come up with a list of 10 design heuristics relevant for designing tools for risk identification and mitigation with regard to user-interaction, functionality or form. From these 10 design heuristics, 5 ideas were handpicked that were most relevant to this design project. For each of the concepts, 2 different design heuristics were applied to create variations of the concepts.

5.6.4 Insights

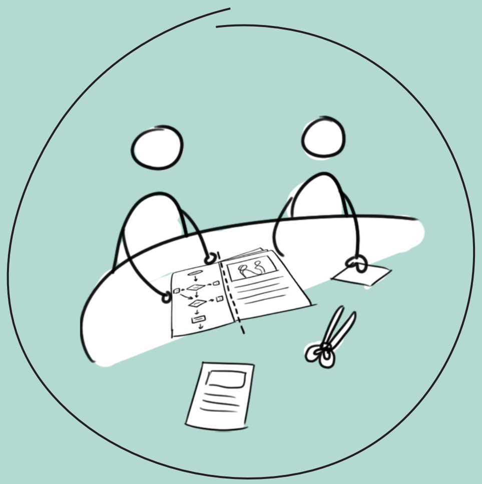
Doing this activity resulted in 15 relevant concepts, that might not have been created without the help of ChatGPT. The outcome of the computer-mediated ideation is visualized on the next page. ▹

5.6.5 Five Concepts

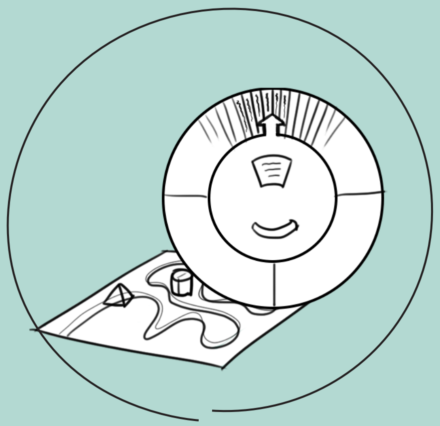
This overview shows the outcome of the computer-mediated ideation process. On the left side, the original concept is displayed. For each of these concepts, two different design heuristics are applied to create variations on the concept. Based on their potential to fulfill the design goal, subgoals and requirements, the best variations were selected (see circles). These concepts were then transformed into lo-fi prototypes using simple materials like cardboard, pens and glue (see Figure 5.8).



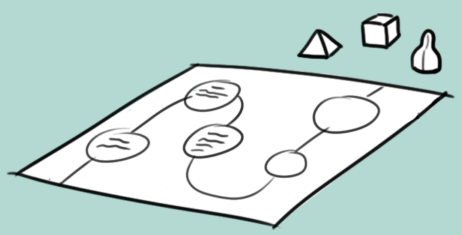
Heuristic #2
Added strategies / flowcharts
to help ethical decision making



Heuristic #5
Facilitating collaborative
generative exercises by using
the book for collaging



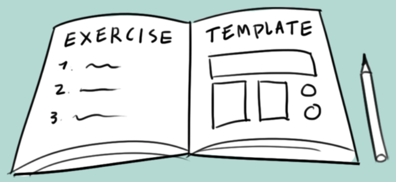
Heuristic #1
Combining the physical map
with a prompt compass to
guide ethical considerations



Heuristic #4
Creating spaces for recording
written reflection on the map,
showing progress through the
research

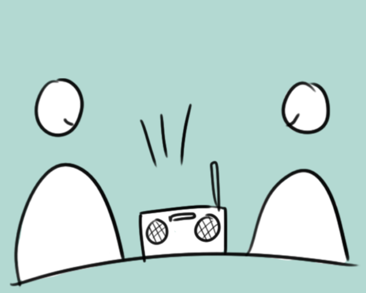
Heuristic #1
Including different scenarios
based on common
introspective themes

Heuristic #3
Creating cards that help
researchers record their own
ethical decision making



Heuristic #5
Facilitate collaboration with
others by including collabora-
tive risk/opportunity exercises

Heuristic #3
Including exercises of different
time/intensity to serve
different user needs



Heuristic #5
Facilitate collaboration by
stimulating discussion after
listening to the audio books

Heuristic #4
Encourage researchers to
record (and share) their own
introspective stories including
ethical decision

Figure 5.8 | *Five lo-fi prototypes based on the outcome of the computer-mediated ideation*

5.7 Ethical Roleplaying

5.7.1 Goal
An ethical roleplaying session was facilitated to evaluate the design concepts and move towards a final concept.

5.7.2 Method
Participants
Three participants were recruited with experience in design but no prior experience in introspective research.

Procedure
This 1,5h session consisted of three roleplaying scenarios in which participants adopted different roles. Each scenario involved different ethical risks and opportunities. In each scenario, a different participant was assigned to be the researcher, and the other participants either had a supporting role or were listening.

The participants were given a one-page narrative scenario which they were asked to act out and read aloud where noted. After each scenario the participants were encouraged to discuss and explore the implications of each scenario, identifying the risks and opportunities involved. They were then asked to go to the five prototypes and select the one(s) that they would have helped them in this scenario.

The session was concluded with an open discussion to address any remaining questions or comments, and to draw a joint conclusion.

5.7.3 Insights
Based on the findings of the ethical roleplaying session, three main insights were gathered that can be considered three key ingredients of the final concept:

1. Short stories (paper or audio) for understanding risks and opp. + impact
The participants thought that the stories in concept 1 or 5 would help them most to **learn about risks and understand their impact**. They had a preference for stories on paper rather than audio. Audio could be fun but only in addition to paper.

2. Concrete exercises to identify and manage risk in own context
The participants agreed that **additionally to stories, they would like to have concrete exercises** to identify and deal with risks in their own project. They were enthusiastic about concept 2, which involved a project map and a compass of prompts to guide them. They like how the exercises were presented in concept 4, where the exercises were categorized by individual/collaborative and time. Besides, they thought the scenario-based game in concept 4 would be a fun way to explore different outcomes, so they saw this as an example of a collaborative exercise.

3. Templates or working sheets that deliver a physical output, that you can revisit throughout the process
To help them get out of their heads and make things concrete, participants mentioned they would like to have templates or working sheets to help them externalize the insights/plans from the exercises. Looking at the concepts, this was somewhat present in concept 1 (making a collage), concept 2 (a map template) and concept 5. Whereas making a collage out of the blue without guidance was a bit too open for the participants, they liked the crafty element of it. They liked the idea of a map, depicting their research journey.

Figure 5.9 | *Roleplaying based on three different scenarios*

Figure 5.10 | *Testing the prototypes during the roleplaying session*

5.8 Conclusion and Project Implications

This chapter started with three How-Might-We questions that served as the starting points for creative exploration. Through face-to-face brainstorming in groups, a large batch of ideas for design concepts was generated for each of the questions. Three individual idea generation sessions were executed, including mindmapping, random word association and mapping extremes, which added to the diversity of the ideas.

From all the ideas generated during the group and individual ideation, five favorite ideas were selected considering their alignment with the design subgoals and requirements. These chosen concepts were subsequently transformed into tangible prototypes. The prototypes were then tested during an ethical roleplaying session with three participants, where the three participants engaged in ethical roleplay scenarios while utilizing the prototypes, providing valuable feedback and observations. From this session, three key insights were generated, which form the main ingredients of the final concept: 1) Short stories for understanding risks and opportunities and their impact; 2) Concrete exercises to identify and manage risk in own context; 3) Templates or working sheets that deliver a physical output, that you can revisit throughout the process.

These insights serve as guides for the development of the final design. They underscore the importance of storytelling, practical exercises, and physical output for achieving the design goal. Moving forward, these findings will shape the final design's content and functionality, ensuring that it aligns to the needs of introspective researchers.

6

Prototype and Evaluation

This chapter describes three approaches to evaluating the prototype of the final design. First, the prototype is shortly introduced (6.1). It is then evaluated with three end-users (6.2). The prototype is then evaluated with an expert in the field of design methodology (6.3). Lastly, the prototype is tested in a real life setting, i.e. the project kickoff of an introspective project involving an experienced introspective researcher and a novice researcher (6.4). A detailed set-up of each evaluation session can be found in Appendix E.

6.1 Toolkit Prototype

The toolkit prototype that was developed for evaluation can be considered a first version of the final design that is presented in chapter 7. Below, the prototype used for evaluation is shortly described to give an idea of what what was tested.

The toolkit consisted of the following components:
1) **Packaging box and sleeve**;
2) **One-page manual**;
3) **Card deck**, containing risk dimensions and opportunity categories cards, six vignettes and seven reflective activities;
4) **Double-sided worksheet** to process the results of the activities;
5) **Double-sided infographic poster**, one side showing an overview of common risks and opportunities, and one side provides a template for creating your own overview.

Figure 6.1 | *The Toolkit prototype*

Fig. X: ...

6.2 Evaluation with end-users

To evaluate the toolkit prototype, a pilot study was conducted with end-users. This pilot study consisted of two parts:
1. **Validation** of the prototype, focusing on usability and desirability
2. **Verification** of the prototype, to find to which extent the design requirements and design subgoals are fulfilled.

6.2.1 Goal

This study was conducted to research the usability and desirability of the toolkit. Besides, the study was used to research if the intended effect was reached, i.e. supporting researchers who are new to using introspection as a method in understanding, identifying and managing the risks and opportunities of their introspective study.

6.2.2 Method

Participants

Three participants were recruited to participate in the pilot study. All participants had a background in Industrial Design Engineering at the IDE Faculty of TU Delft. The participants had no prior experience with using introspection as a method, but they had a basic understanding of the method.

Procedure

I. Usability (Lab) testing + Desirability

First, a short introduction of the project was given and participants were asked to introduce themselves and their prior knowledge of introspection.

Then, the participants were given a scenario in which they were a researcher starting an introspective study. With this scenario in mind, the participants were given realistic tasks of things that they would have to perform in real life.

While executing these tasks, the participants were asked to think out loud as much as possible. The tasks covered all important aspects of the toolkit. To cover all vignettes and exercises, different participants were given different combinations of vignettes and exercises.

During the tasks, questions were kept to a minimum to avoid interfering too much. If a participant would ask questions about the working of the tool, the question would be redirected to the participant (Where can I find A? --> Where do you think you can find A?).

After the tasks, the participant was asked a set of questions about usability and desirability.

II. Verification

For the next part, a set of 10 cards was prepared, stating the 7 design requirements and 3 subgoals. The participants were asked to pick the cards that reflect their experience with using the toolkit (no specific number was requested). Afterwards, the participants were asked to explain why they chose the specific cards as a reflection of the experience with the toolkit, and follow-up questions were asked.

6.2.3 Insights

In this paragraph, the key insights of the evaluation sessions with end-users are discussed. Findings are categorized by general insights, usability and desirability. Lastly, the fulfillment of the design requirements and subgoals is discussed.

Usability (How do they use it)

1. Executing tasks

Observing the execution of the different tasks, some strong and weak points of the toolkit usability can be observed. **It was clear to the participants what the different components of the toolkit are and where to start.** When opening the box, they first grab the card deck and manual

During activity C, one participant could not find the impact and probability tables. These were placed on the backside of the worksheet, but the participant was not aware that they should turn the sheet around: *"I wouldn't have flipped this worksheet over and see what's on the backside. That could be more explicit."* - Evaluation P1

While looking through the card deck, one participant mentioned that they would prefer if the vignettes would be numbered. Furthermore, two participants preferred to have a **larger sized worksheet** because they could not fit enough writing on the A3 sized worksheet.

2. Looks and interaction

All participants were **positive about the visual presentation.** They liked the illustrations and design. One participant states: "I'm immediately drawn to the illustrations. I like the graphics and colors". A participant mentioned the illustrations support the text well, and they help to concretize the different risks and opportunities. Another participant finds the visual presentation 'engaging'.

"It's appealing to work with because of the looks, and because it's really structured. There's a certain order. That makes it easier to work with it." - Evaluation P2

Desirability (Would they use it)

1. Setting

All participants state that they would like to use this toolkit if they were to start an introspective study. They think that this toolkit will have a **positive impact on their study**. They say the toolkit 'makes them more aware', 'helps them make better choices' and makes them 'more careful with how to conduct a study and what to publish'.

"Having this toolkit, I would feel more empowered to use introspection. I would feel like I could make better study choices." - Evaluation P1

Figure 6.2 | *A participant doing the activity quickscan in the card deck*

The participants expressed some preferences on the setting and moments in which they would use the toolkit. Two of the participants mentioned that they would use this most likely in a **collaborative setting or workshop setting**: *"I think this would also be nice to do with others in a session, together with other researchers who use introspection. Just have an afternoon of using this toolkit together, and discussing your findings."* - Evaluation P2

Besides, participants liked that the toolkit offers flexibility in terms of working individually as well as in terms which content applies to their project: *"I also like how this toolkit is very flexible. I can adapt it to my own needs. If I'm in a very anti social mood, it's still going to work. And also if I only want to focus on the risks, it's also flexible."* - Evaluation P1

One participant mentions that the first part of the toolkit is more suitable to do individually (checking out all the components, reading the vignettes) whereas they would prefer doing the activities in a collaborative setting.

A participant mentions that they would like to **use this toolkit while writing a project proposal** for their project: *"I would probably use this toolkit until I have a final project proposal. And then depending on how often you change your draft proposal, I use it more often."*- Evaluation P3

Design Requirements and Subgoals

1. Awareness and identification

During the verification part of the testing sessions, the 7 design requirements and the subgoals were discussed using cards to visualize which requirements they considered more fulfilled. This confirmed the fulfillment of most requirements. Participants were very convinced that the toolkit helps them become **more aware of the risks and opportunities**. It is also helpful to **consider risks and opportunities in their own project context**.

"I can imagine not everyone thinks about these things when they start a research. And as soon as they learn what actual risks there are, they are like: maybe it's not smart to do it this way. So then you're more careful with how you continue the research and what you publish." - Evaluation P2

Participants feel like the toolkit helps them to make more

Figure 6.3 | *Discussing requirements and subgoals*

deliberate decisions: *"I think using this toolkit would make me more cautious and therefore more careful with how I conduct my study and what I publish."* - Evaluation P3

2. Time-efficient

Besides, they were very positive how **time-efficient** the toolkit was. This is also due to the beforementioned flexibility of the toolkit: *"I think it's really engaging and it's really time efficient. Sometimes people have to take an 8 week course to understand these concepts and now it's very digestible and simple."* - Evaluation P1

3. Individual and collaborative use

Participants scored the 'facilitate individual use as well as collaborative use' requirement on the lower end. They mentioned that their **individual testing setting** made it hard to imagine whether this would work in a collaborative setting. Lastly, they thought that the activities helped them to think about strategies, but that these **strategies were still somewhat abstract**. They say it would be even easier for them if more concrete strategies were provided.

6.3 Expert Evaluation

6.3.1 Goal
To evaluate the desirability of the final concept and prototype from a zoomed out perspective, i.e. that of a researcher with an expertise in methodology in the IDE Faculty.

6.3.2 Method
Participant
A researcher with an expertise in methodology was recruited.

Procedure
To give the participant enough time to check out the contents of the toolkit, PDF files of each toolkit component were sent to the participant in advance.

To start the session, first a short introduction to the project was given, including the main decisions that lead to the final prototype. The physical prototype was then shown and explained. Afterwards, there was room to discuss any unclarities.

The participant was then asked questions on different desirability aspects through a semi-structured interview, revolving around the following topics: overall impression of the toolkit, utility, target group, usability, comparable tools and barriers for the tool being adopted.

6.3.3 Insights
Below, the main insights that were gathered during this user test are discussed. The insights are centered around the value of the toolkit, the use the toolkit, the components and barriers for adoption.

Value of this toolkit

1. Impression of the toolkit
The expert thought this this toolkit would be valuable for researchers who are starting an introspective research project. He found it a **promising**, **well thought-through** toolkit that can help researchers to be more explicit and more conscious about the decisions they make in their process. A perceived strength of this toolkit is that it is **practice-base ethics**, which according to them, can only benefit researchers.

2. Value compared to other options
The expert stated that they would definitely recommend this toolkit to students or researchers. They also don't really have other tools to give that cover the specific risks and opportunities of introspection. This toolkit fills a gap in 'understanding how introspection works and how to get the most out of it'. If more tools are developed, the expert might give a list of all tools that are there. Where **they could see this tool ending up is in the Delft Design Guide (or some handbook of qualitative research)** as a one-pager, where this is used as one of the sources.

When it comes to understanding risks and opportunities in your study, the two most practiced approaches are either to follow the institutional ethics procedures, or to do nothing. The expert thinks that doing nothing is not a feasible option, it will all be trial and error. They always encourage some conscious thinking. With regard to the institutional ethics, **the expert does not think the details and feedback of the toolkit overlap with the HREC**.

Figure 6.4 | *Physically writing is beneficial for the introspective mindset, because it allows to be more mindful (photo from Kickoff Evaluation)*

Use (target group and setting)

1. Target group
Despite having been designed for novice introspective researchers, the expert thinks that the toolkit might also be **suitable for experienced introspective researchers** and they might even get more out of it. The questions is whether they will do it, but "that's not your problem".

2. Setting
They like both using the toolkit it individually and together. But they think it might be more frequently used in groups or pairs. They think it could be like an **onboarding or sensitizing activity**.

Toolkit Components

1. Aide-mémoire
The expert praised the idea of the poster. He thought of it as an "Aide-mémoire": something that helps you remember something. He thinks it is useful to have the poster lying around, because otherwise you can easily forget about it. He commented there might be some ways to make it more tailored, and shared the idea of making it a kind of "souvenir".

2. Worksheet
A point of improvement for the worksheet might be to make it larger, to have some more space to write on. A digital option, in Miro for example, might also be a way to do this. This could also have benefits for collaboration, readability, accessibility and more. However, the expert personally would prefer to use a paper worksheet. They thought the process of physically writing can help researchers with the **introspective mindset**, because it allows to be a bit more mindful.

3. Resources
A suggestion is to **add a sheet with resources**. Especially for risk dimensions and opportunity categories, it would be nice to know where they come from. Additionally, information on where to find extra resources might be added. This might make it more to the taste of the target group, which probably all have a scientific background.

Potential barriers for it being adopted
When asking what might be potential barriers for this toolkit being adopted, they mentioned that two barriers came to mind:

A. Accessibility in material form
To make it more broadly accessible, it would be beneficial to put the toolkit **online**. License it in a way, and make it open science. Then it might be more frequently used. It's also nice to be able to be flexible, so to have both a paper and a digital form.

B. Accessibility in intellectual form
This point is more about how intuitive it is to use, as well as how long it should be so that it is useful, but not too long for people to want to use it.

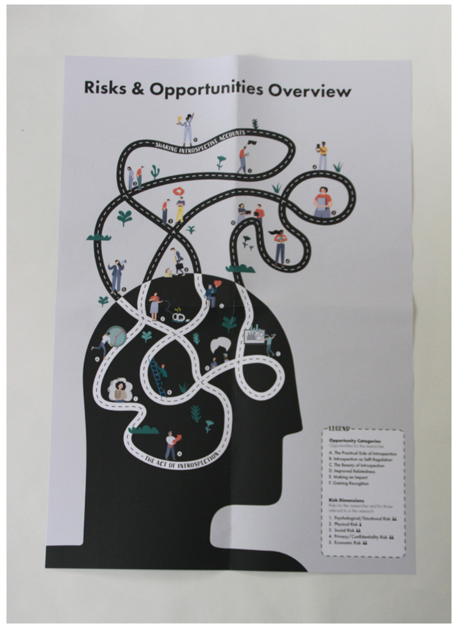


Figure 6.5 | *The expert praised the idea of the poster that serves as a reminder*

6.4 Testing at a Project Kickoff

6.4.1 Goal
The goal of this testing session was to evaluate the utility, usability and desirability of the toolkit in a real life setting, i.e. the kickoff meeting of an introspective project between a student and their supervisor.

6.4.2 Method
Participant
One master student and their supervisor participated in this study. The master student had no prior experience in doing introspective research but has a basic level of understanding of the method. Their supervisor had experience with using introspection as a method.

Procedure
To test the toolkit in a real life setting, I was invited to join the kickoff meeting of an introspective research project. This meeting was the starting point of their 1-month study about the effect of not using social media on wellbeing. The researchers were planning to do regular self-interviews to collect data.

After a short introduction at the beginning of the meeting, the researchers were asked to ignore my presence and act as they would have done normally. They were given the toolkit without any further explanations.

During the meeting, data was gathered through naturalistic observation (see Figure 6.6). Any remarkable events were noted, to discuss them after the meeting.

After the meeting, a set of questions was asked about the utility, usability and desirability of the toolkit. Furthermore, extra focus given to evaluating the collaborative aspects of the toolkit, as well as suitability for using it during a kickoff meeting. The session was video- and audio-recorded.

6.4.3 Insights
In this paragraph, the main insights of the testing is discussed. First, general insights, usability and desirability are discussed. Lastly, the collaborative qualities of the toolkit are discussed.

General insights
1. Overall impression
The participants were positive after using the toolkit: *"Fantastic tool, I really love it. This interaction is nice, it's easy. And I really like the stories. The stories are really engaging and are providing nice context, and also diverse context for you to think about your project. That worked pretty well."* - Supervisor

The student found that the toolkit was **structured** and that it helped them to **'open their minds'** and have new thoughts about their project.

Usability
1. Risk dimensions and opportunity categories
They really liked having the risk dimensions and opportunity categories to consider risks and opportunities in their own study. However, they thought they would be better presented if they were **separate cards** (not as part of the card deck).

2. Poster
Besides, they found the activity with the poster very

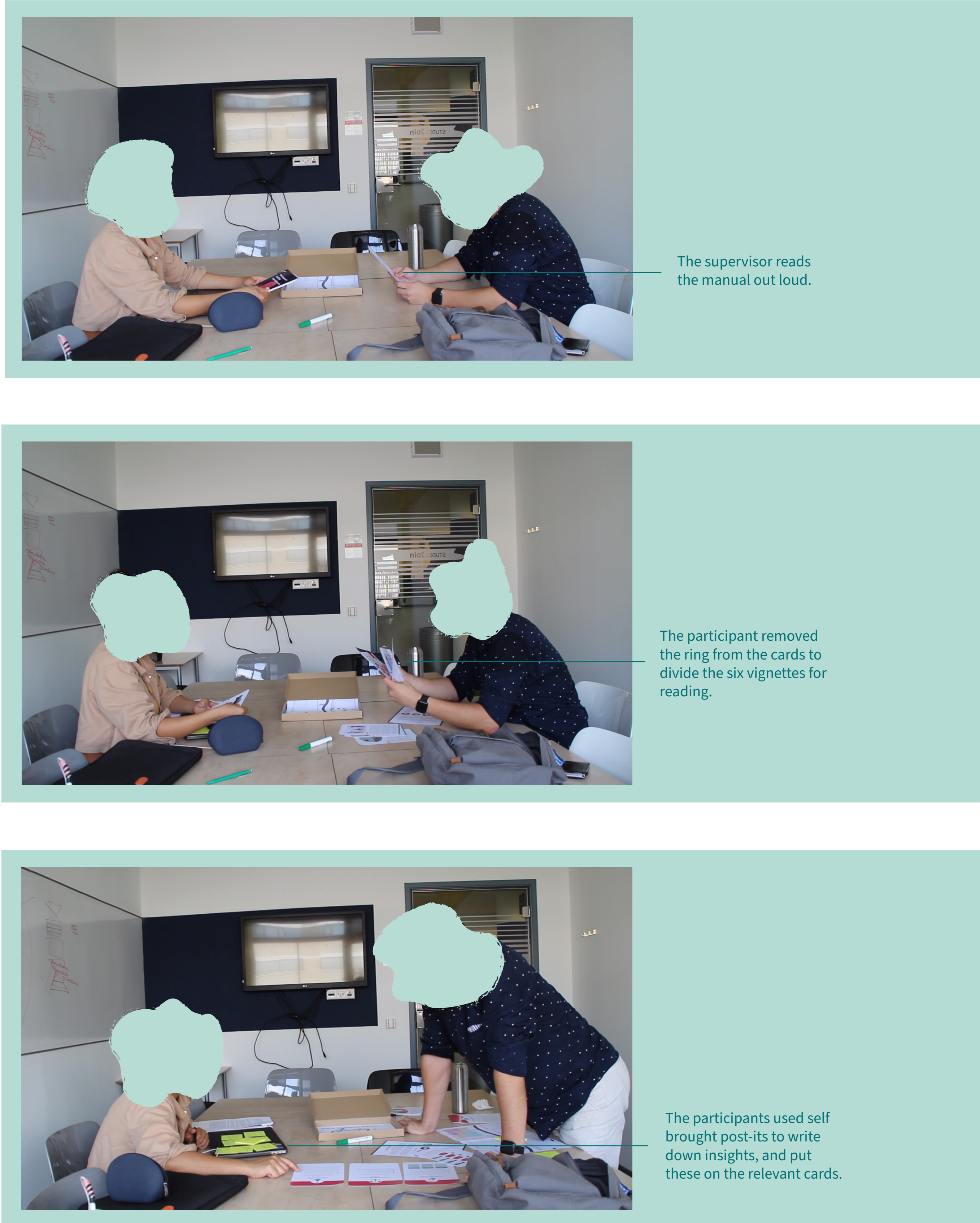


Figure 6.6 | *Three stills from the kickoff meeting evaluation*

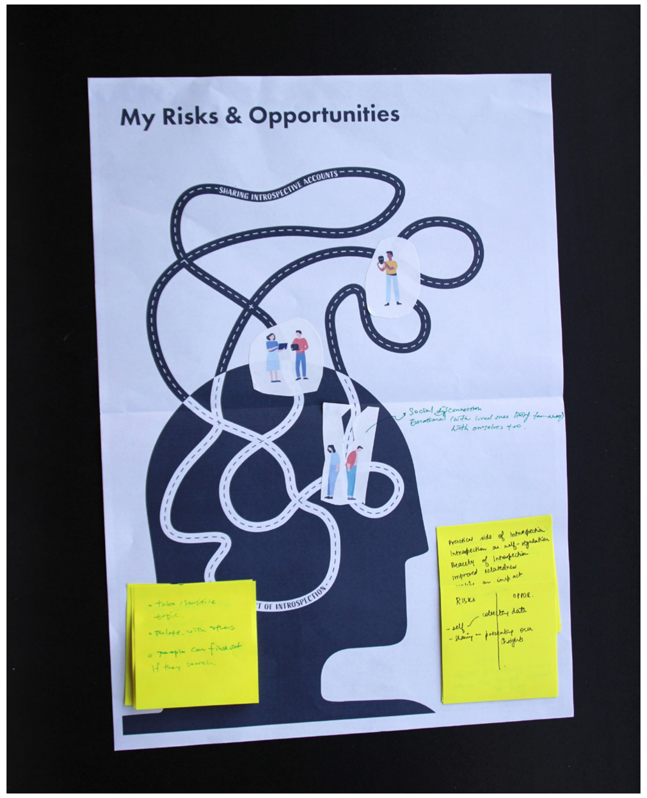


Figure 6.7 | *The poster template was used to make an agreement between supervisor and student*

helpful, and recommended me to make the role of the poster/artefact more prominent. It could be the first step, and could be considered the artefact they work on throughout the process and that will be the end result. Speculating about the ideal situation, the paper poster could even be turned into a magnetic board, to make it more easy to shuffle things around.

3. Worksheet

They liked having the worksheet, to **have a place to work on that can be a bit more messy**. While reading the vignettes and working on the assignments, I observed that the participants used some **post-its** that they brought themselves to write down thoughts. When asking about this, they suggested to add a pack of post-its to the toolkit. This is handy addition to the worksheet, because it allows to shuffle things around.

Desirability

1. Novice researchers

The supervisor would be excited to use the toolkit again, especially with a novice introspective researcher on board: *"If I have to explain everything, first of all I don't think I can give such a nice overview, but if I try, this is going to cost me a lot of energy. With this, we can just sit down, in one our, one hour and a half, with the research team and go through the process. And then everyone is better prepared."*

2. Using it again

The student also thinks this toolkit is desirable, and that it would be nice to come back to the toolkit later in the process to **reconsider risks & opportunities**: *"I also think we will come back to this later, just to see where we started and where we're now"*. To collect insights during the process, they have the idea to use the poster for this.

Collaboration

1. Collaboration and interaction

The first part of the toolkit was executed more individually (i.e. reading the vignettes, learning about different risks and opportunities). Afterwards, the participants shared their insights together and worked together on the activities. The participants agreed that the toolkit **facilitated a nice interaction for them as a team**. To improve their collaboration when using the toolkit, they suggested that **role cards** could be added to the toolkit to instantiate clear, complementing roles. In their case, it was their first time working together so clear roles could have improved their dynamic. For example, one might be considered more of a moderator, whereas the other could be writing down the insights.

6.5 Conclusion and Project Implications

In this chapter, a toolkit prototype has been evaluated with three end users, an expert in the field of methodology and two introspective researchers at the kickoff of their project.

The usability of the toolkit was studied through executing tasks, questions, and observations. Overall, participants were positive about the user-friendliness of the toolkit. The purpose of the different components was clear, and the content was simple and understandable despite the complex topics. They also mentioned that the toolkit was time-efficient. The process was well-structured and users praised the flexibility of the toolkit. The activity quickscan allowed to focus on relevant exercises, and the participants liked that the toolkit can be used both individually and collaboratively. Besides, participants were enthusiastic about the engaging visual presentation (colors, illustrations, harmony) of the toolkit components.

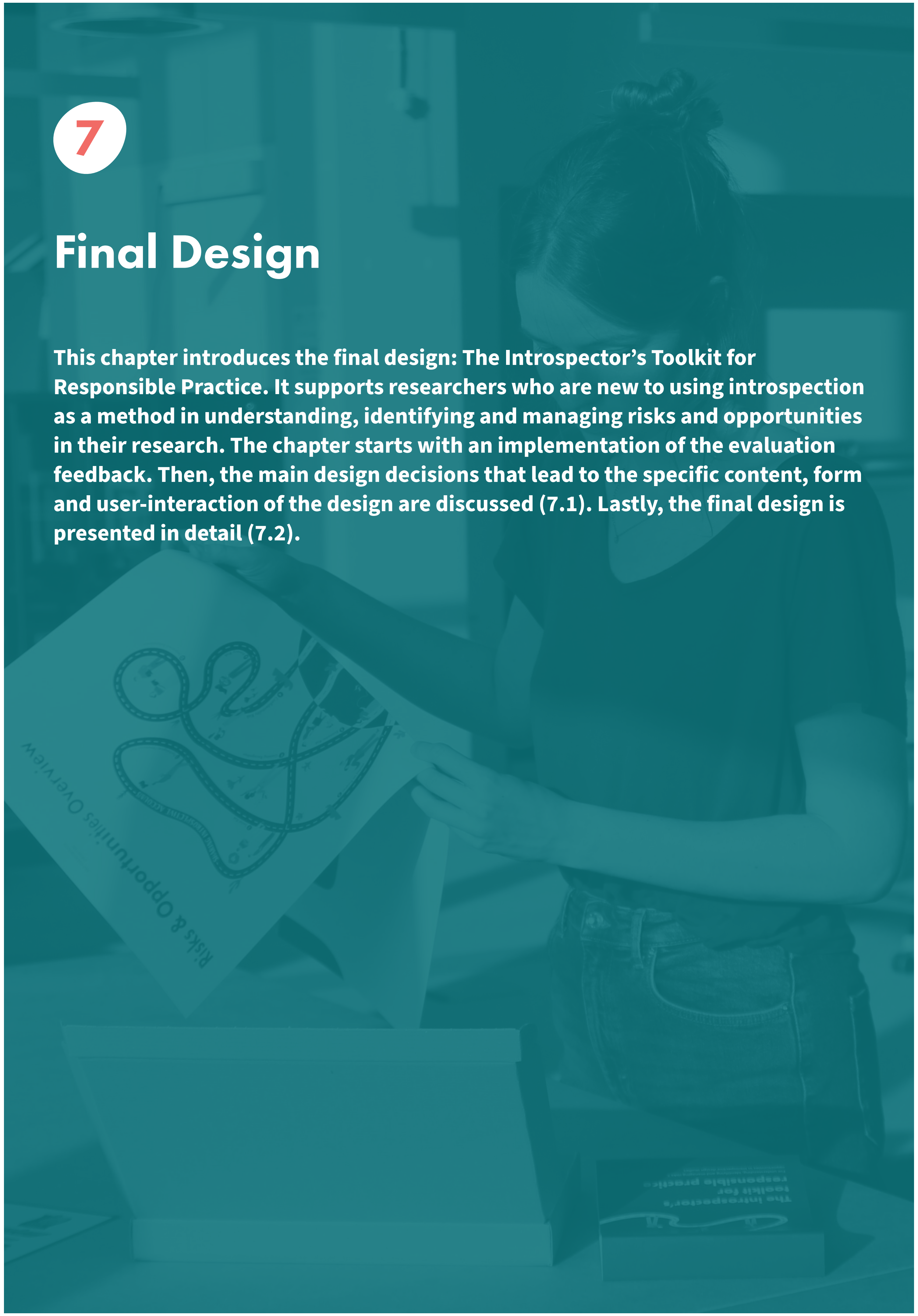
All participants agreed that the toolkit is something they would want to use if they were to do an introspective project. A strength of the toolkit is that it helps researchers become aware of risks and opportunities and helps them to identify these in their own project. Participants liked how the vignettes made R&O more concrete and provided diverse contexts. This helps them to take more considerate decisions in their project, and even helped to make researchers feel more empowered to use introspective methods. The practice-based approach of the toolkit makes the content digestible.

These sessions confirmed the fulfillment of the main design requirements and subgoals. The prototype increased awareness and understanding of risks and opportunities and it encouraged researchers to look ahead in their own project context.

Researchers thought the risk and opportunity management strategies were helpful, but they could benefit from even more specific and actionable strategies. Besides this point, some more points of improvement were identified. These include:

1) Improving readability (Integrating the legend of the poster in the poster itself, numbering the vignettes, adding visual indicators to poster and worksheet regarding the backside);
2) Improving the workability of the worksheet (making it larger, adding post-its);
3) Optimizing and adding to the configuration of the components (presenting the risks and opportunities as separate cards, adding a sources and resources sheet);
4) Increasing the role of the poster/artefact in the process;
5) Optimizing the toolkit for a workshop setting;
6) Adding role cards to the toolkit for a clear dynamic when using the toolkit collaboratively;
7) Changing the form of the poster to e.g. a magnetic board.

These strengths and points of improvement serve as input for a last design update. This leads to a final design and recommendations, which are described in the next chapter.



7

Final Design

This chapter introduces the final design: The Introspector's Toolkit for Responsible Practice. It supports researchers who are new to using introspection as a method in understanding, identifying and managing risks and opportunities in their research. The chapter starts with an implementation of the evaluation feedback. Then, the main design decisions that lead to the specific content, form and user-interaction of the design are discussed (7.1). Lastly, the final design is presented in detail (7.2).

7.1 Towards a Final Design

In this subchapter, I first elaborate on the design changes to create the final design, compared to the toolkit prototype. Then, I describe how the three key ingredients that formed the outcome of ethical roleplaying (i.e. stories, exercises and templates) are squeezed together and reshaped into a final design. To get there, multiple design decisions had to be made on content, form and user-interaction.

7.1.1 Design Update

Based on the evaluation sessions, the most critical feedback was selected for implementation. Criticality of the feedback has been valued based on several aspects, namely, functionality, usability and impact/effort ratio estimate of design changes. This has resulted in four main changes to the toolkit prototype:

1) Improving readability:
• Integrating the legend of the poster in the poster itself
• Numbering the vignettes
• Adding visual indicators to poster and worksheet regarding the backside
2) Improving the workability of the worksheet:
• Making it larger
• Adding post-its
3) Optimizing and adding to the configuration of the components:
• Presenting the risks and opportunities as separate cards
• Adding a sources and resources sheet
4) Increasing the role of the poster/artefact in the process:
• Integrating the poster more throughout the activities

The feedback that has not yet been implemented can be found in the recommendations section and is meant for further development of this toolkit (Chapter 8.3).

7.1.2 Content

Storytelling through Vignettes

To make researchers more aware of the different risks and opportunities and to help them understand how these might manifest themselves in a real context, vignettes were created. Vignettes are short stories about a fictional event or character. They place the character's behavior in a concrete context. To build the narrative, inspiration was drawn from common introspective themes (troubling experience) as well as common research themes at the IDE faculty at TU Delft (e.g. health, inclusivity).

Vignettes can help researchers to explore their perspective on the risks and opportunities described in the vignette. To cover all risks and opportunities, but retain efficiency for the researcher, risks and opportunities are combined to form logical combinations for a narrative.

Each story is told from the I-perspective, to make it easier for researchers to place themselves in the shoes of the character. To refine the vignettes, multiple iterations were made and the vignettes were proof read by different people. The vignettes were kept to-the-point by establishing a word limit of 300 words.

This has resulted in six vignettes, of which the first three cover risks and opportunities in the act of Introspection, whereas the last three vignettes cover risks and opportunities that can occur when sharing/publishing the introspective account.

Reflection methods

To help researchers reflect on the vignettes and make sense of it, different methods of reflection are researched. Driscoll's model of reflection was chosen due to its level of simplicity. This model is based on 3 questions, i.e.:

- "What?" - Describing what happened
- "Now What?" - Explaining why that action or event was significant
- "So What?" - Explaining how you will use the information to inform future practices (Driscoll, 1994)

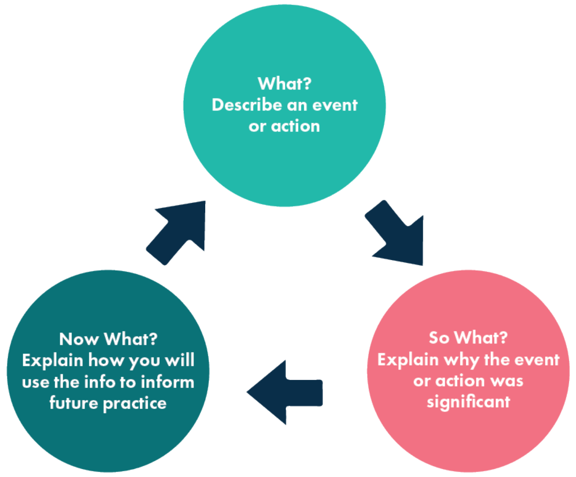


Figure 7.1 | *The three questions that make up Driscoll's (1994) model of reflection*

Applying this model in my project context, resulted in the following eight reflection activities:

1. Reflecting Prior Knowledge (What): A first exploration of and reflection on the researcher's knowledge and preconceptions related to the risks and opportunities of introspection.

2. Identifying Opportunities (What): Using the Vignettes to understand the variety of opportunities, and to identify the opportunities in the researcher's own project context.

3. Identifying Risks (What): Using the Vignettes to understand the variety of risks, and identifying the risks in the researcher's own project context.

4. Understanding the Effect on Wellbeing (So What): Understanding the effect on wellbeing by assessing the probability of your identified risks and their impact.

5. Strategies for Opportunities (Now What): Formulating concrete strategies for enhancing one or more opportunity.

6. Strategies for Risks (Now What): Formulating concrete strategies for managing one or more risk.

7. Integrating in your Study (Now What): Concretizing how to embed the defined strategies in the researcher's study routine

8. Making a Visual Summary (Now What): Creating a DIY poster as a visual summary to remind researchers of opportunities, risks and strategies throughout the project.

Risk assessment and management

To support researchers with assessing the effect of risks, a simple and to the point risk impact and probability matrix was developed. This is a tool used in qualitative risk analysis to evaluate the likelihood and impact of identified risks. For each risk dimension, 3 levels of impact were formulated. Additionally, 3 levels of probability were formulated, which are universal for the different risk dimensions. These levels were then processed into an impact table and probability table. Using these tables can help researchers determine the "scores" of impact and probability, which they can then use to fill out the matrix.

To help researchers define strategies for dealing with risks and opportunities, 3 relevant strategies for risks were defined:

1. Accepting risks: Acknowledge that a risk can happen, but no action required

2. Mitigating risks: Reduce the probability or the impact of the risk

3. Avoiding risks: Eliminate the cause of the risk / Not pursue things that can cause harm

For opportunities, 2 strategies were defined:

1. Accepting opportunities: Acknowledge that an opportunity can occur, but no action required.

2. Enhancing opportunities: Intensify, increase, or further improve the quality, value, or extent of the opportunity

In the activities, researchers are encouraged to concretize the strategy that is relevant to their risk or opportunity.

Figure 7.2 | *A color scheme and illustration that were created to accompany a vignette*

7.1.3 Form and User Interaction

Physical/Digital

During ethical roleplaying, participants expressed a preference for a physical tool over a digital tool. This lead to the decision to develop physical tools, which together make up a toolkit . However, to increase the availability/accessibility of the toolkit, the toolkit is developed as such that it the tools are also ready-made downloadable files that can be placed on a website.

Visual Style

A comprehensive style guide was developed encompassing color palette, typography selections, and key design elements to ensure a consistent and cohesive visual identity across the toolkit components.

Readability

To design for both paper and digital readability, design choices were made regarding a.o. contrasting colors, font size (not too small), language (avoiding jargon and complex word + using short sentences), and harmony in the layout.

Illustrations

To make the text more memorable and engaging, hand drawn vector illustrations were made in Adobe Illustrator. A character-based style was chosen to encourage researchers to put themselves in the character's shoes. First, a style guide was created, along with designed elements to build the characters (heads, limbs, upper and lower bodies). Then, illustrations were made to fit the content of cards, worksheet and poster. Texture and stroke effects were added to give the illustrations more character. Figure 7.2 displays one of the illustrations made to accompany a vignette.

Figure 7.3 | *Trimming the cards of the final prototype card deck*

7.1.4 Toolkit Components

Card deck

Experimenting with different paper size, an A5 format was chosen to provide enough space for the vignettes and activities. By choosing a card format with a ring to keep the cards together, researchers can easily place the reflective exercises next to the relevant vignettes, or remove the ring completely if desired.

Worksheet

To process the results of the activities, a worksheet was designed. For the worksheet, multiple forms and interactions have been considered, and discussed with participants: use of magnets, drawing exercise, booklet, game, cards. Participants expressed a preference to keep it simple, and avoid unnecessary work or waste of time. Therefore, the final worksheet was kept simple to maintain the time-efficient and to-the-point character of the toolkit. A double-sided A2 sized sheet with open space for writing was designed.

Risk and Opportunity Cards

To explain the definitions of the different risk dimensions and opportunity categories, small cards have been designed. These double sided cards are used in the first activity, and can be used throughout the set of activities to check on the definitions.

Poster

An infographic poster was designed to provide researchers with a full overview of common risks and opportunities within the act of introspection and sharing an introspective account. The backside of the poster serves as a template for researchers to make a visual summary of their learnings. This artefact is considered the end result of the toolkit. To support this exercise, two sticker sheets have been designed with stickers showing risks, opportunities and empty ones.

Manual

To explain the different components of the toolkit and to get researchers started, a one-page manual was designed. This manual includes an introduction to the toolkit, the aim of the toolkit, the different components and a quick guide on how to use it. Furthermore, the manual includes a QR code to an explainer video.

Explainer Video

To explain the purpose of the toolkit and explain how to use it, a short animated explainer video was designed using an online animated video-making platform.

Resources sheet

A sheet with extra resources is provided to help researchers who are interested in more information on risks and opportunities in introspection. This sheet also contains a link to my thesis, to find the main sources that this toolkit is based on.

Packaging

Packaging was designed to combine all components into one toolkit. An A4-sized cardboard mailbox package was chosen because it perfectly fits the components, is light and easy to carry around, provides enough protection, and makes the toolkit easily distributable. A box sleeve was designed including the toolkit name and purpose, and the visual style that is incorporated throughout the tools.

7.2 Final Design: The Introspector's Toolkit for Responsible Practice

7.2.1 Final Design Overview

The Introspector's Toolkit for Responsible Practice helps researchers to understand, identify and manage the risks and opportunities of their introspective studies.

Main objectives

The Introspector's Toolkit for Responsible Practice aims to support researchers who are new to using introspection as a method in:

1. Becoming aware of and understanding the variety of risks and opportunities in introspective research
2. Identifying risks and opportunities in their own project context
3. Managing risks and opportunities by applying effective strategies

Toolkit Components:

1. Card deck: Activities
2. Card deck: Vignettes
3. Activity Worksheet
4. Risk & Opportunity Overview Poster
5. Sticker sheets
6. Risk & Opportunity cards
7. Manual
8. Explainer Video
9. Resources & References Sheet
10. Packaging

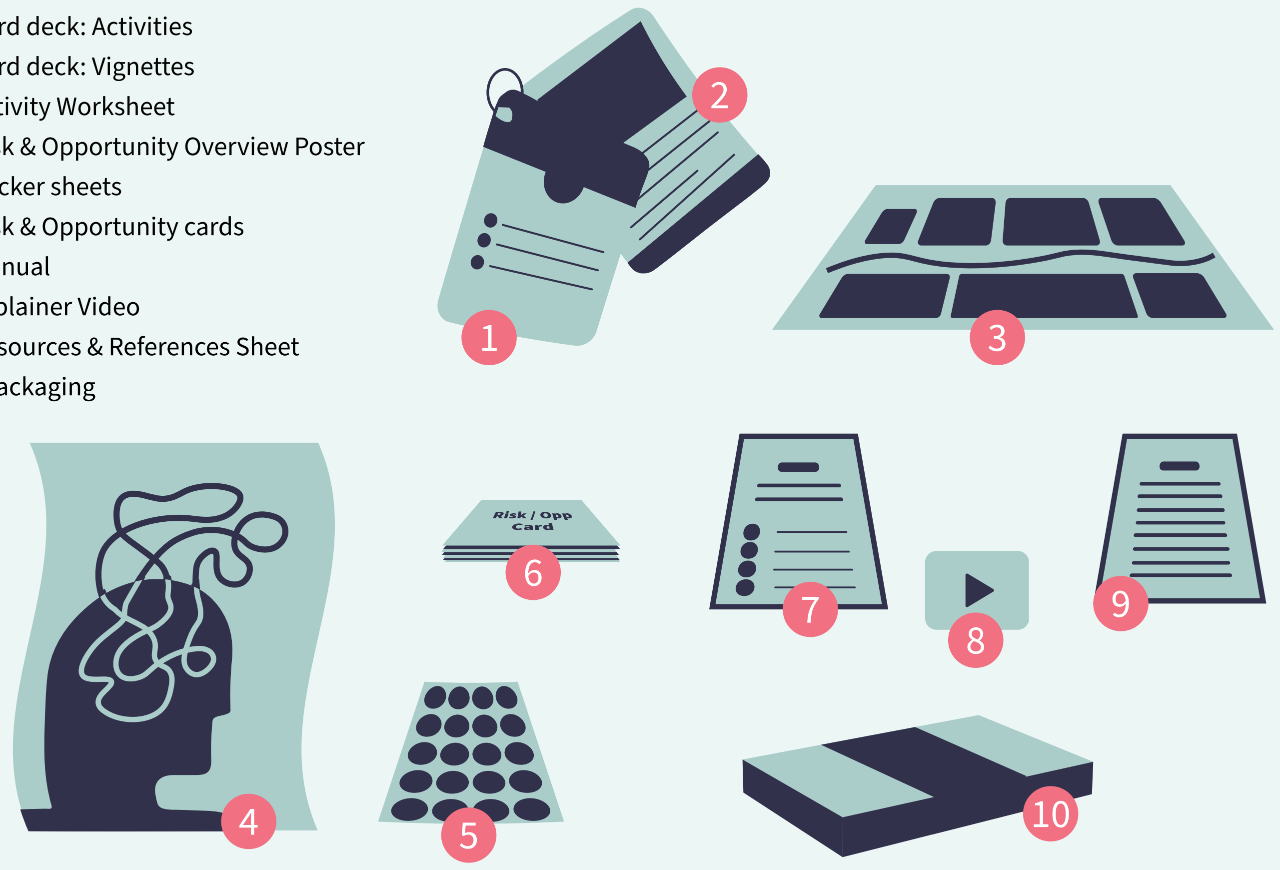


Fig. X: ...

Figure 7.4 | *The final Toolkit prototype*

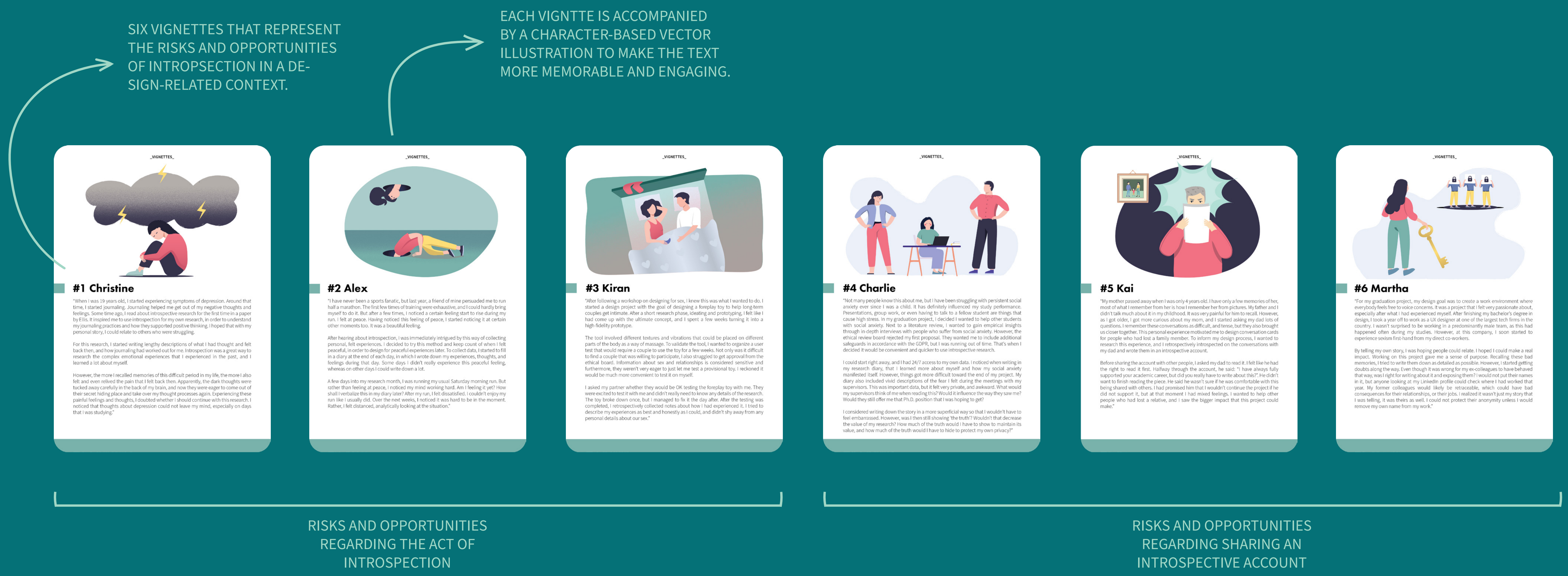
7.2.2 Card Deck

The card deck contains 16 cards including a front page, six vignettes, an activity quickscan and eight activities.

FRONT OF THE CARD DECK.

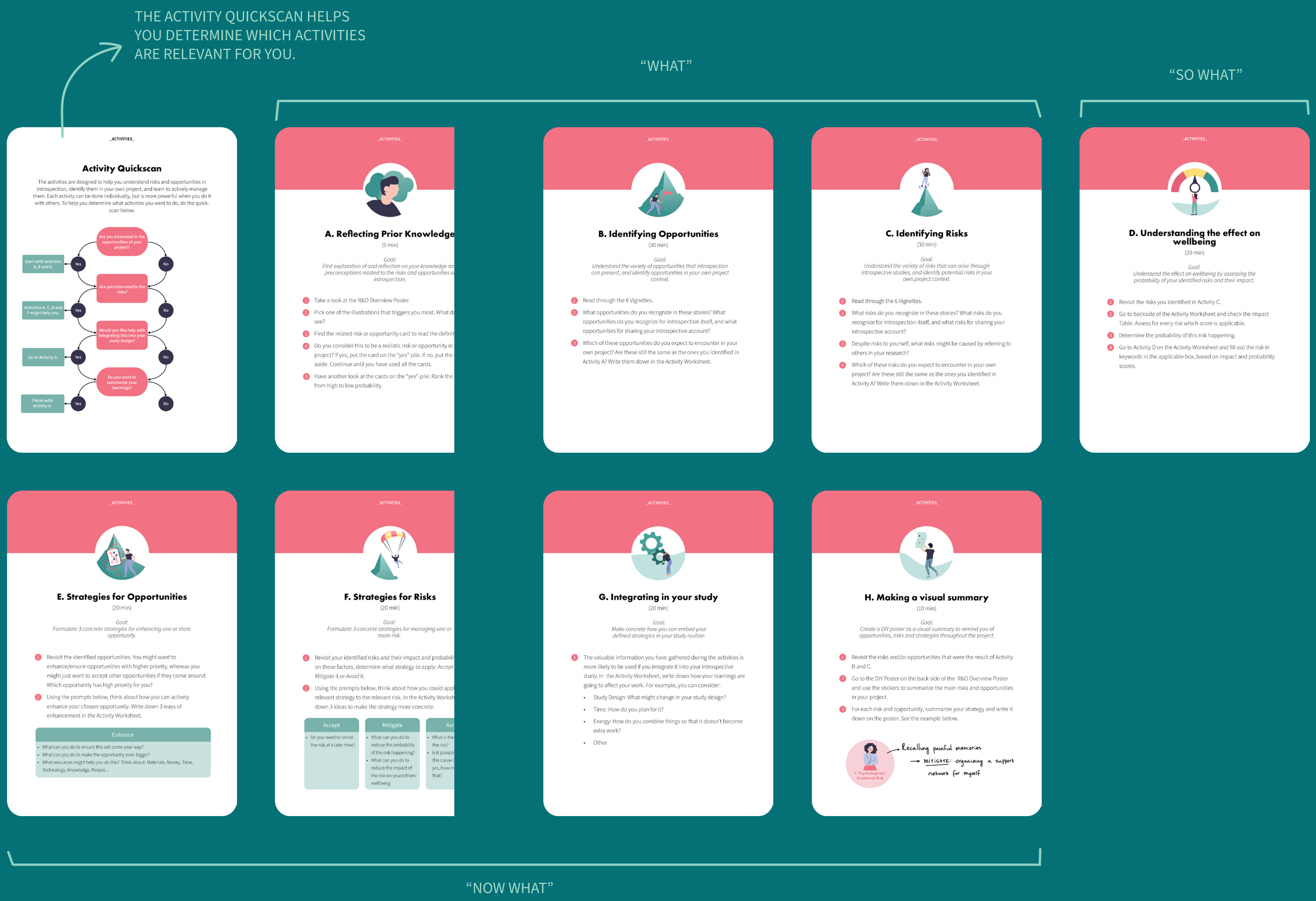
7.2.3 Card deck (Vignettes)

The card deck contains six vignettes. Each of these presents a combination of different risks and opportunities. The vignettes are situated in a design context. The goal is to help researchers understand how risks and opportunities can manifest themselves within the act of introspection, as well as when sharing an introspective account. Each vignette is supported by an illustration to make the text more memorable and engaging.



7.2.4 Card deck (Activities)

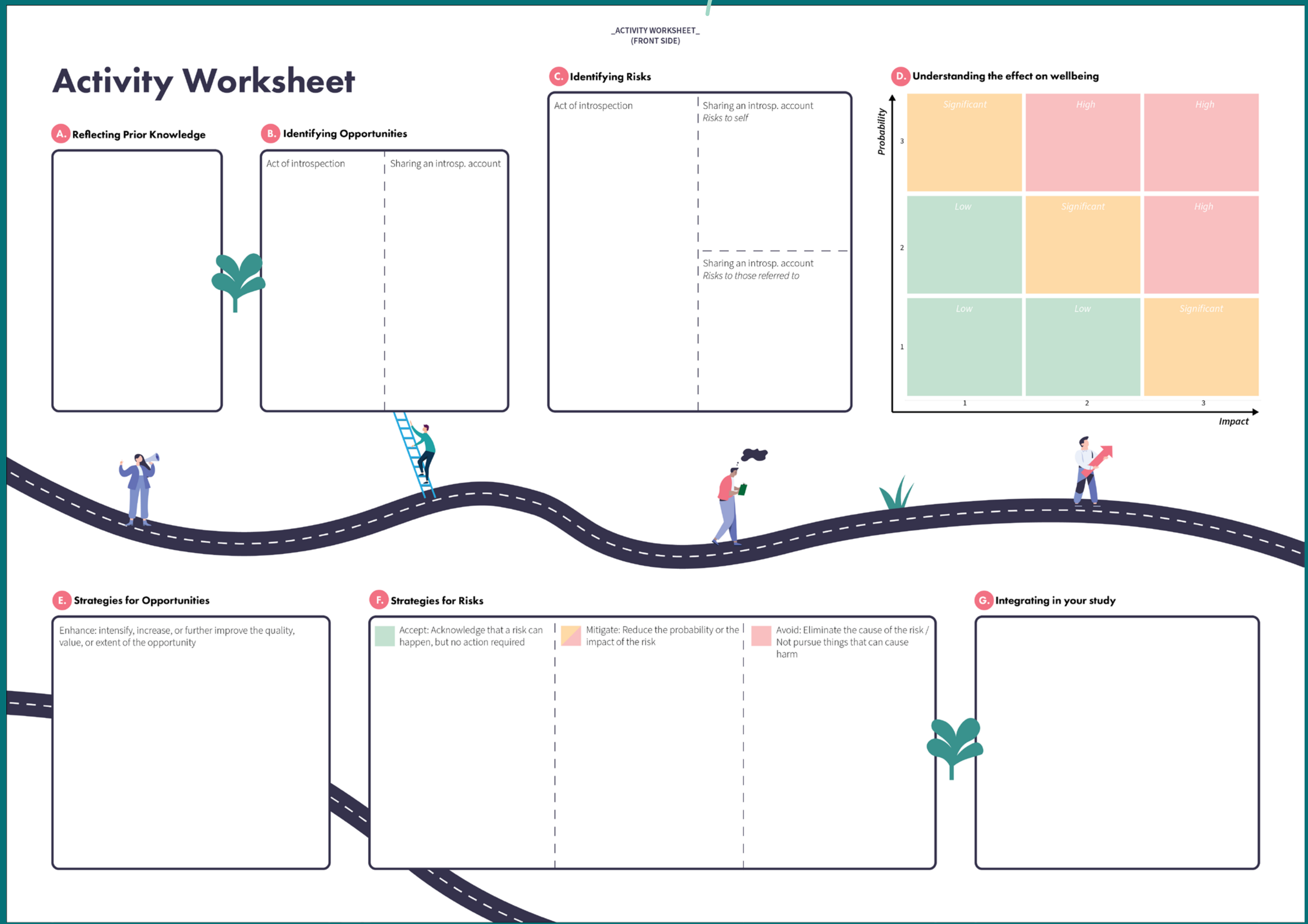
The card deck contains eight activities, as well as an activity quickscan to help researchers determine which activities are relevant for them. Each activity contains a time estimation, goal, and a list of steps. The activities are based on Driscoll's (1994) model of reflection. The first three activities are focused on the "What": what risks and opportunities are there, what do they look like, what do I already know about it. The fourth activity is about the impact of risks and hereby addresses the "So What". The last four activities are action-oriented and address the "Now What": what strategies can be applied to manage risks and opportunities, how do I integrate these into my study, and how can I summarize and memorize my learnings.

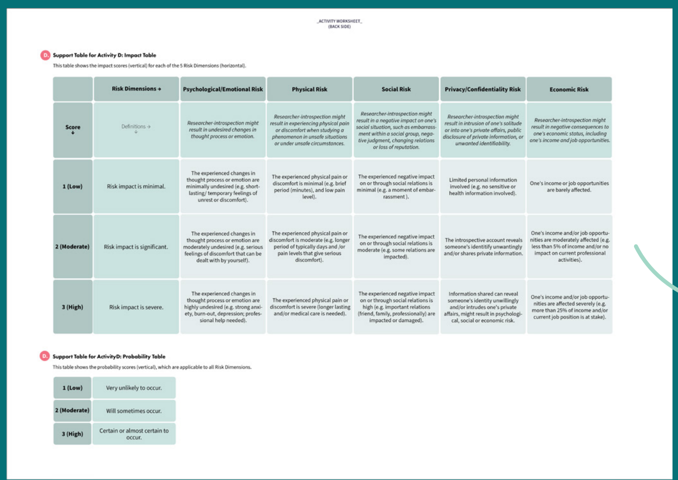


7.2.5 Worksheet

To help researchers process the outcomes of the activities in a structured way, an activity worksheet is provided. The back side of the worksheet provides support tables to Activity D, i.e. an impact table and a probability table.

THE WORKSHEET CAN BE USED TO PROCESS THE OUTCOMES OF THE ACTIVITIES.





THE BACK SIDE OF THE WORKSHEET PROVIDES SUPPORT TABLES TO ACTIVITY D: AN IMPACT TABLE AND A PROBABILITY TABLE.

7.2.6 Poster (front side)

The front side of the poster presents a large infographic, showing common risks and opportunities within the act of introspection vs sharing an introspective account. This can help researchers think about the risks and opportunities they can expect in the two phases in their own study.

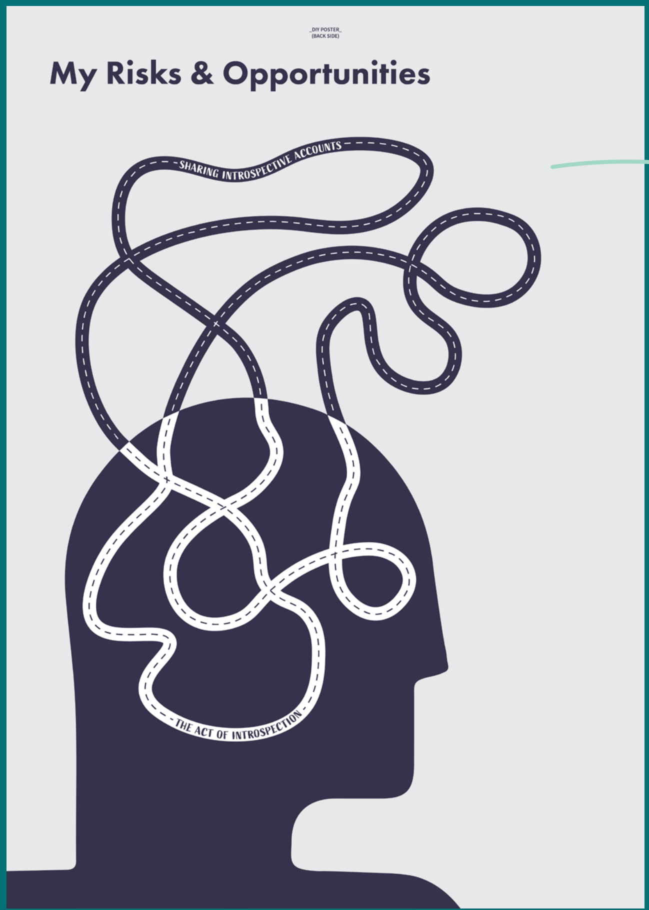
COMMON RISKS AND OPPORTUNITIES WHEN SHARING INTROSPECTIVE ACCOUNTS (OUTSIDE THE HEAD)

COMMON RISKS AND OPPORTUNITIES WITHIN THE ACT OF INTROSPECTION (INSIDE THE HEAD)

LEGEND SHOWING AN OVERVIEW OF ALL OPPORTUNITY CATEGORIES AND RISK DIMENSIONS

7.2.7 Poster (back side)

The back side of the poster is a DIY poster. This template can be used to visualize your own risks, opportunities, impact and strategies as a way of making a visual summary. Researchers can use this summary to be reminded of their learnings throughout the process, or as a way of a visual agreement when used in a collaborative setting.



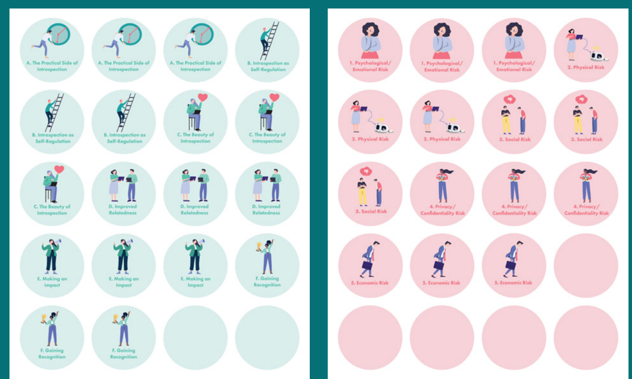
THE BACK SIDE OF THE POSTER SHOWS A DIY POSTER TEMPLATE THAT RESEARCHERS CAN USE TO MAKE A VISUAL SUMMARY OF THEIR LEARNINGS.

TO VISUALIZE RISKS AND OPPORTUNITIES, TWO STICKERS SHEETS ARE PROVIDED INCLUDING THE RISKS AND OPPORTUNITIES.

THE SHEETS INCLUDE MULTIPLE STICKERS OF EACH CATEGORY, AS WELL AS EMPTY STICKERS TO CREATE YOUR OWN CATEGORY OR CONTENT.

7.2.8 Sticker sheets

Sticker sheets are provided as support material for making the visual summary. These stickers show the different risk dimensions and opportunity categories, as well as some empty stickers to create your own content or category.



7.2.9 Risk and Opportunity Cards

The risk and opportunity cards present the different opportunity categories and risk dimensions and their definitions.

FRONT SIDE

BACK SIDE

EACH CARD CONTAINS A TITLE, DEFINITION, AND ACCOMPANYING ILLUSTRATION

7.2.10 Manual

A toolkit manual is provided to inform researchers about the goal and the different components of the toolkit. This sheet is the first thing researchers see when opening the toolkit. The manual also contains a QR code to the explainer video.

THE MANUAL START WITH AN INTRODUCTORY TEXT EXPLAINING THE TOOLKIT BACKGROUND.

Scan for an explainer video!

Toolkit Manual

About this Toolkit

You are a design researcher (or researching designer) who has decided to enter the wonderful world of introspective methods. In your study, you are both the researcher and researched. This dual role, along with the personal, revealing nature of introspection is what gives this method its unique opportunities and risks. Risks may affect you (the researcher-participant), but may also affect those you refer to in your research. After all, introspective accounts of your personal experiences almost always implicate others in your life.

This Toolkit will support you in doing your introspective study responsibly. It is designed to help you understand, identify and manage the risks and opportunities of your introspective research, minimizing the potential harm, while maximizing the opportunities. This toolkit distinguishes between risks and opportunities within two main areas in the process of introspection: the act of introspection itself, and sharing (e.g. publishing) your introspective account. You can use the toolkit individually, but it is more powerful when you do the activities with others.

Toolkit Components

1. Take the card deck and find the **Activities.** You can just do them all or use the Activity Quickscan to check out which Activity to start with.
2. Read the **Vignettes** in the card deck to learn from other researchers how risks and opportunities manifested themselves in their design-related introspective studies.
3. Use the **Risk and Opportunity Cards** to understand the definitions of the different Risk Dimensions and Opportunity Categories.
4. Fill out the **Activity Worksheet** to draft up your results of the Activities.
5. The Risks & Opportunities (R&O) **Overview Poster** can be used to view common risks and opportunities within the Act of Introspection versus Sharing your Introspective Account. Use the back side of the poster to create a **DIY Poster** as a visual summary and reminder in Activity G.

5 STEPS EXPLAINING HOW TO USE THE DIFFERENT TOOLKIT COMPONENTS.

7.2.11 Resources & References

A resources & references sheet is provided for those who are interested in more information on ethics of self, ethics of referring to others, or introspection in general. The sheet also contains a link to this thesis, for researchers who are interested in the foundational research supporting the development of this toolkit.

PERSONAL RECOMMENDATIONS ON SUPPLEMENTARY RESOURCES.

Resources and References

Resources

For those seeking further information, I have listed a couple of personal recommendations on supplementary resources.

If you want to learn more about ethics of self:

Chatham-Carpenter, A. (2010). **"Do thyself no harm": Protecting ourselves as autoethnographers.** Journal of Research Practice, 6(1), Article M1. Retrieved [May 2023], from http://jrp.icaap.org/index.php/jrp/article/view/213/183

Edwards, J. (2021). **Ethical Autoethnography: Is it possible?** International Journal of Qualitative Methods, 20, 1–6. https://doi.org/10.1177/1609406921995306

Doloriert, C., & Sambrook, S. (2009). **Ethical confessions of the "I" of Autoethnography: The Student's Dilemma.** Qualitative Research in Organizations and Management: An International Journal, 4(1), 27–45. https://doi.org/10.1108/17465640910951435

If you want to learn more about ethics towards others:

Ellis, C. (2007). **Telling secrets, revealing lives.** Qualitative Inquiry, 13(1), 3–29. https://doi.org/10.1177/1077800406294947

Tolich, M. (2010). **A Critique of current practice: Ten foundational guidelines for Autoethnographers.** Qualitative Health Research, 20(12), 1599–1610. https://doi.org/10.1177/1049732310376076

Rambo, C. (2007). **Handing IRB an unloaded gun.** Qualitative Inquiry, 13(3), 353–367. https://doi.org/10.1177/1077800406297652

If you want to learn more about introspection in general:

Xue, H., & Desmet, P. M. A. (2019). **Researcher introspection for experience-driven design research.** Design Studies, 63, 37–64. https://doi.org/10.1016/j.destud.2019.03.001

Ellis, C. (1999). **Heartful Autoethnography.** Qualitative Health Research, 9(5), 669-683. https://doi.org/10.1177/104973299129122153

Höök, K., Caramiaux, B., Erkut, C., Forlizzi, J., Hajinejad, N., Haller, M., Hummels, C. C. M., Isbister, K., Jonsson, M., Khut, G., Loke, L., Lottridge, D., Marti, P., Melcer, E., Müller, F. F., Petersen, M. G., Schiphorst, T., Segura, E. M., Ståhl, A., ... Tobiasson, H. (2018). **Embracing first-person perspectives in soma-based design**. Informatics, 5(1), Article 8. https://doi.org/10.3390/informatics5010008

References

The foundational research sources used in the toolkit's development can be found in my master's thesis: (link added once the thesis is published in the TU Delft Repository)

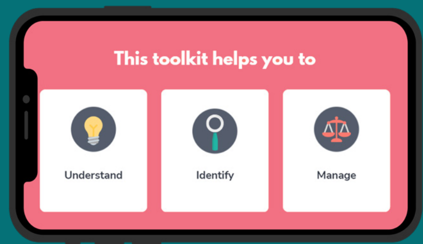
REFERRAL TO THIS GRADUATION THESIS TO GIVE INSIGHT IN THE FOUNDATIONAL RESEARCH SOURCES OF THE TOOLKIT.

7.2.12 Explainer Video

To make engagement with the toolkit as easy as possible, an explainer video was made. This 2-minute video explains the purpose of the toolkit, the different risks and opportunities and how to use it. The contents of the video are similar to those of the manual. The explainer video is especially useful when using the toolkit in a collaborative setting.

A 2-MINUTE ANIMATED EXPLAINER VIDEO WITH VOICE OVER.

THIS VIDEO CONTAINS A.O.:



THE PURPOSE OF THE TOOLKIT

THE RESEARCH BEHIND THE TOOLKIT

HOW TO USE THE TOOLKIT

7.2.13 Packaging

The toolkit components are fitted into an A4-sized cardboard mailbox package. This protects the components when carrying them around and makes the toolkit easily distributable. The box is covered with a sleeve that includes the toolkit name, purpose and a QR code to the video explainer.

QR CODE LINKING TO THE EXPLAINER VIDEO.

7.2.14 How to use the toolkit

Figure 7.6 | *Ten photos showing how to use the toolkit*

7.2.15 Theoretical Underpinning

The final design of the Toolkit is grounded in a strong theoretical underpinning. This theoretical underpinning informs critical aspects of the toolkit, including the risk dimensions, structure, and method of reflection.

By drawing from relevant existing literature on ethical risks in introspective methods, five risk dimensions have been defined that inform the core content of the toolkit. These dimensions have become the guiding lenses through which researchers assess and navigate risks within introspective research. These dimensions are woven into the fabric of the toolkit, serving as a continuous reference point for researchers to consider and address potential risks throughout their introspective studies.

The opportunity categories, that provide guiding lenses for researchers to assess the opportunities in their own project, are based on the empirical research in this project. This has resulted in six opportunity categories.

The reflective activities rely on Driscoll's model of reflection, which provides a simple structure for the reflective activities based on 'what', 'so what' and 'now what'.

7.2.16 Availability and Dissemination

How would researchers receive this toolkit?

The dissemination of the 'Introspector's Toolkit for Responsible Practice' is recognized as a critical factor in its potential impact. There are two logical options for making this toolkit available to researchers:

1. Toolkits are bought and distributed by institutes

The first option involves a model where institutes and organizations can purchase and distribute the toolkit to their research communities. This approach ensures a structured and coordinated distribution process, fostering a sense of institutional support and commitment to responsible introspective research practices.

2. The toolkit is digitally available (open source)

The second option embraces the principles of open research / open science. The make the reach of the toolkit even wider, a simple web page can be designed that allows researchers to download the different tools of the toolkit. See Figure 7.7 for an example wireframe and Figure 7.8 for a visual style example. This approach encourages flexibility: it allows researchers to access the toolkit at any time, take it with them an anywhere, and easily share it it with others. It also allows researchers to print only the files they need, making this a more sustainable way of dissemination.

Digital Toolkit Webpage Wireframe

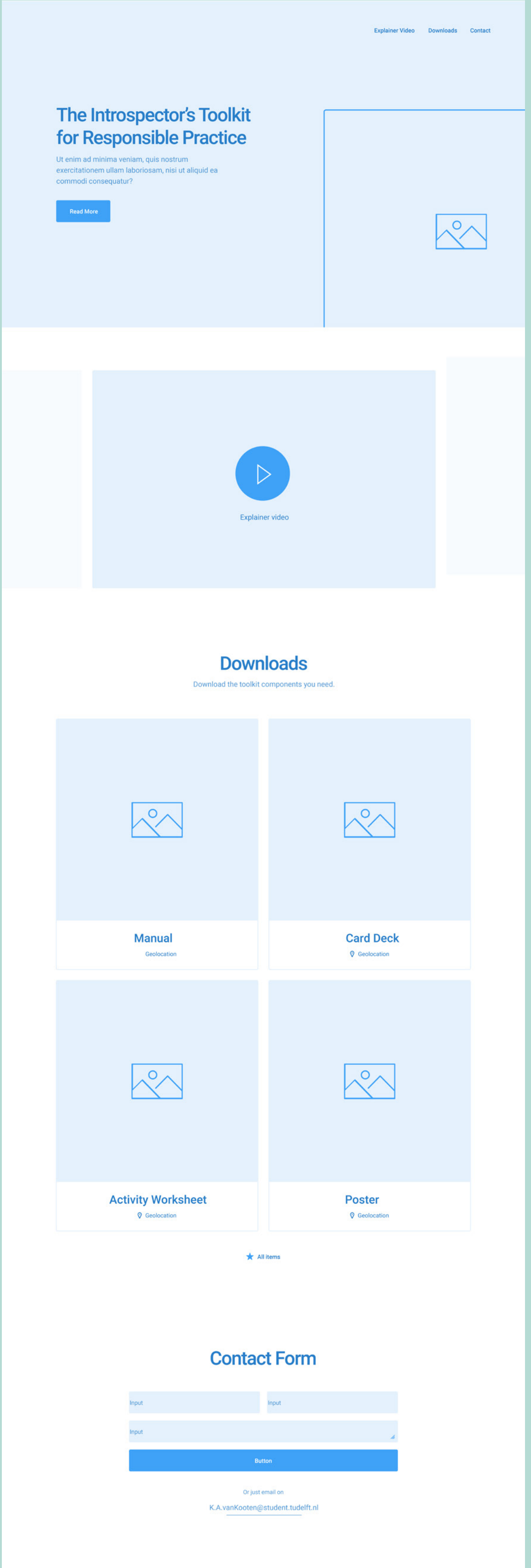


Figure 7.7 | *Example wireframe for a toolkit web page*

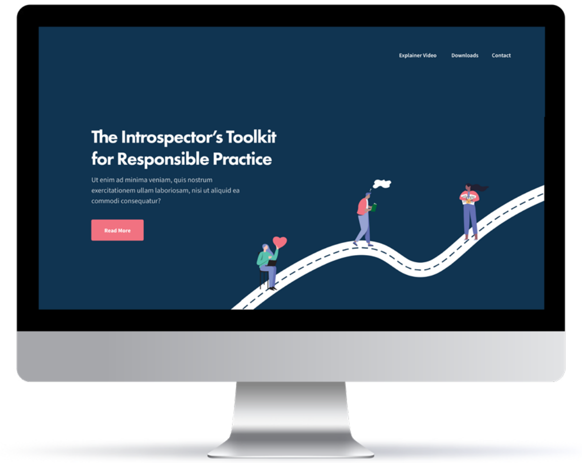


Figure 7.8 | *Example of a toolkit web page*

The Introspector's Toolkit for Responsible Practice should be considered a tangible research output rather than a commercial product. It is desirable to make this Toolkit open source, to increase it's availability and accessibility for researchers.

How would researchers know about the existence of this Toolkit?

To inform researchers about the existence of this toolkit, a campaign is proposed to increase awareness. Researchers might be notified about this Toolkit through different channels (i.e. posters, social media, workshops). An effective option could be to design a slide with an evocative statement that lecturers/researchers can include in presentations. The slide should trigger researchers' curiosity, and include a link to further information. In Figure 7.9, two examples are proposed.

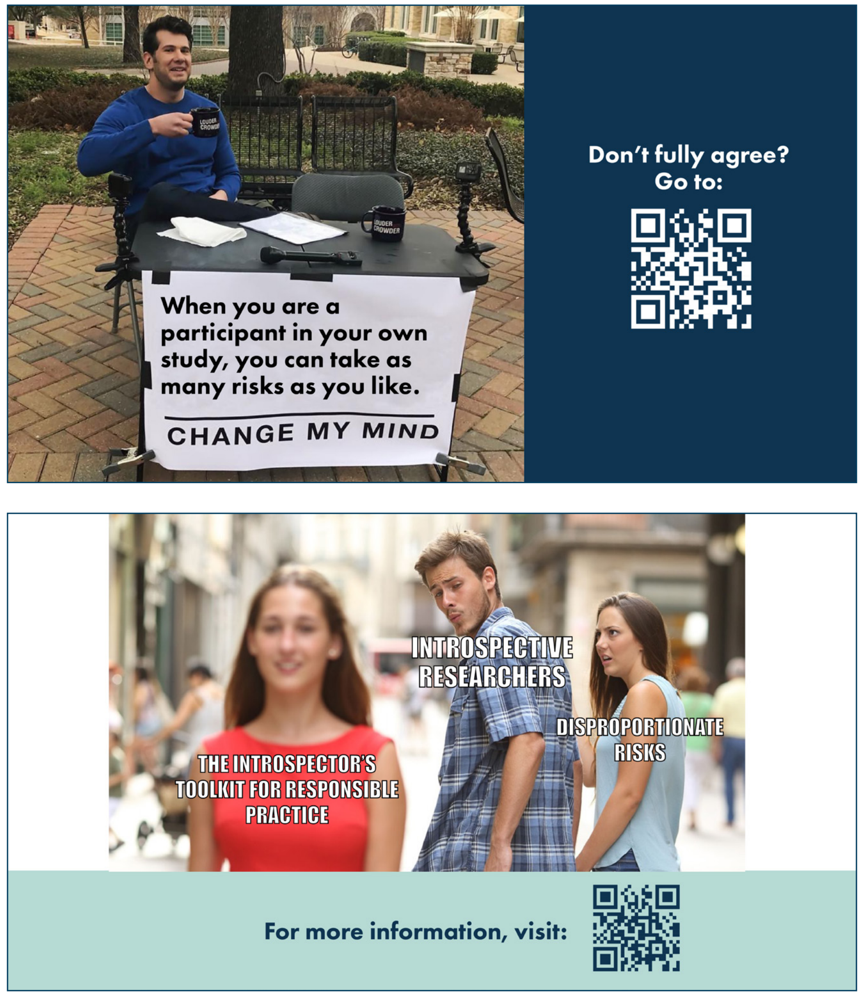


Figure 7.9 | *Two examples of evocative slides to trigger researchers's curiosity*

Costs

To give insight into the financial feasibility of this toolkit, a cost overview is provided below. The costs in this overview are based on the costs of the final design prototype.

Table 7.1 | *Costs of the different physical toolkit components*

Component	Specs used for final design prototype	Cost (€)
Card deck	16 A5 cards, 350gr pro-graphic white paper, single-sided	6,16
Ring	40mm metal rings	1,42
Activity Worksheet	A2 42 x 59,4 cm 4/4 double sided, full colour 100 grams mat mc	1,66
Risk & Opportunity Overview Poster	A2 42 x 59,4 cm 4/4 double sided, full colour 170 grams mat mc	3,00
Two sticker sheets	Round contour cutted stickers	6,64
Risk & Opportunity cards	2 A4 sheets, 350gr pro-graphic white paper, single sided	1,54
Manual	A4 sheet, 250gr	0,67
Resources & References Sheet	A4 sheet, 250gr	0,67
Packaging Box	Cardboard Box Size A4 - 31 x 21.5 x 3 Cm	0,96
Packaging Sleeve	Two sleeves on one A2 42 x 59,4 cm single sided, full color 170 grams mat mc	1,43
Total		**24,15**

To make the toolkit financially even more desirable, different options could be considered for lowering costs. The costs above are based on prices that are favorable at low print runs, however, often times **prices drop at higher print runs**. This is beneficial for all printed components, and could especially make a big difference for relatively expense components like the stickers, card deck and poster. A second option is to **compromise on paper or print quality**. For example, the Activity Worksheet and Poster might be printed on thin paper, or a smaller paper size. Lastly, it could be considered to **offer a part of the content as online documents** only, to decrease the printing costs. For example, the manual and resources & references sheet might become digital documents, that can be visited through a code or link on the package. Of course, a fully digital toolkit would compromise on all above-mentioned material costs. Costs of a digital toolkit might include a website domain and hosting, and costs of building the website.

7.3 Conclusion and Project Implications

This chapter started with the implementation of the evaluation feedback. The following four changes to the prototype have been implemented:

1) *Improved readability* by changing the poster legend, numbering the vignettes and adding visual indicators to poster and worksheet regarding the backside;

2) *Improved workability* of the worksheet by increasing its size and adding post-its;

3) *Optimized and expanded configuration* of the toolkit components by presenting risk and opportunity definitions on separate cards and adding a resources sheet;

4) *Increased emphasis on the poster* throughout the process by already pointing to the poster in the first activity.

Then the main design decisions are explained that have lead to the final content, form and user-interaction of the toolkit. Some important decisions include the implementation of Driscoll's model of reflection (1994), the development of a risk impact and probability matrix, and the visual style and illustrations.

These design decisions and design update have lead to the final design, i.e. The Introspector's Toolkit for Responsible Practice. This toolkit consists of 10 designed components:

1. Card deck: Activities
2. Card deck: Vignettes
3. Activity Worksheet
4. Risk & Opportunity Overview Poster
5. Sticker sheets
6. Risk & Opportunity cards
7. Manual
8. Explainer Video
9. Resources & References Sheet
10. Packaging (Box and Sleeve)

Each component has been thoughtfully crafted to contribute to the goal of the toolkit: to help researcher understand, identify and manage the risks and opportunities in their study.

To make the toolkit available to researchers, two approaches are suggested: 1) Toolkits are bought and distributed by institutes, or 2) The toolkit is digitally available (open source). Even though this project has been centered around creating a tangible toolkit, all tools have been designed to be usable as digital files as well. To illustrate what a digital version of the toolkit may look like, a suggestion for a webpage design was made.

To make researchers aware of the existence of this toolkit, it is suggested to host a campaign. To reach researchers in the design field, evocative slides that lecturers/researchers can include in presentations are proposed.

Lastly, the financial feasibility of the toolkit is discussed and different options are proposed for lowering production cost including higher print runs, compromising on paper or printing quality, and digitizing components.

8

Discussion,Conclusion and Recommendations

The final chapter concludes this thesis with a project evaluation. First, the contribution of this project is discussed and limitations are set (8.1). Secondly, conclusions are drawn by evaluating the design goal, design subgoals and requirements (8.2). Then, recommendations for further design development and research are suggested (8.3). Lastly, a personal reflection on the project is presented (8.4).

8.1 Discussion

The aim of this project was to help researchers understand, identify and manage the risks and opportunities of their introspective studies. A practical toolkit has been designed as a way of ethics in practice to help researchers perform their research in a responsible way. Evaluation of the toolkit prototype with researchers indicated that the toolkit is an engaging, time-efficient means to do this. Researchers feel like using the toolkit makes them more aware of the different risks and opportunities, are helped to identify these in their own project, and know better how to manage these. Based on researchers' feedback, a final design update has been made, incorporating the most critical points for improvement.

8.1.1 Scope

Contribution to theory

The findings of this thesis could be used to help understand how designers have engaged and can engage with the ethical dimension of their introspective research. This thesis contributes to existing theory by proposing five dimensions of risks that are common within introspective studies. Besides, through empirical studies, six opportunity categories have been defined. These dimensions and categories can provide guiding lenses for researchers to assess and navigate risks and opportunities. No other dedicated ethical perspective on introspection in the domain of industrial design has been available so far. This thesis also adds to existing literature by proposing an important distinction within the risks (and opportunities) of introspection, namely, to distinguish between 1) risks that can arise during the act of introspection and 2) risks that come from sharing an introspective account.

Whereas different researchers have already come up with guidelines/recommendations for ethical practice in introspection (see Chapter 2.3.5), no tools are available to help introspective researchers with ethics in practice. This toolkit and its underlying theoretical foundation, provide insight into how we might design for this.

Contribution to design practice

This project contributes to design practice in addressing the lack of (structured) responsible ethical guidance for introspective studies. A toolkit has been developed as a practical, accessible approach to help researchers perform their research responsibly.

8.1.2 Benefits and Limitations

Risk Dimensions

During literature research, five distinct risk dimensions have been identified based on analysis of risks encountered in various publications. These dimensions play an important role as they are used throughout the design process and ultimately to structure the toolkit. I cannot claim that the literature research in this project is exhaustive or complete. However, while analyzing the different papers, similar risk dimensions were encountered again and again. To prevent inefficiency in the project, the literature search was finalized after repetitive similar risk findings.

Furthermore, this toolkit does not address indirect risks, e.g. a privacy risk might again cause a psychological/emotional risk. Both a more detailed categorization of risks and insight into their relation might improve researcher's understanding of risks. However, the added value of the toolkit is to enable researchers to think about risks (alongside the dimensions); both direct and indirect risks might be addressed anyway.

Testing outcome
Within this project, multiple small, qualitative user tests have been conducted with in total 20 participants divided over different interviews, prototyping or evaluating sessions (students, researchers and experts). Larger sample sizes would be needed to suffice for statistical measurements, and to draw conclusions that are representative for the target group.

The toolkit prototype has been tested in three individual settings as well as a collaborative setting. The collaborative setting in which the toolkit has been tested is limited to that of a supervisor and their student. Besides, an important note is that the supervisor and student worked together for the first time during this meeting. This might have influenced their dynamic, and thus their interaction with the toolkit. No other formations or group sizes have been tested. More research into collaborative use of the toolkit is needed to establish its value for collaboration. The outcome of the collaborative evaluation was in line with the results of the individual evaluations, providing sufficient confidence in the value of the final design.

Evaluation coverage
During the prototype evaluation, different participants tested different parts of the activities. A typical testing session lasted about 1,5 hour, enabling testing of 3-4 activities. To consider time and availability of the participants, this lead to limitations in the coverage. However, all activities have been covered and trending to similar outcome.

The implementations that have led to the final design have not been evaluated with end-users. However, the final design is roughly 80% overlapping with the tested toolkit prototype, so no unexpected field experience is foreseen.

Risk management
During the toolkit prototype evaluation, two participants mentioned that they could benefit from more predefined strategies of managing in particular the risks. Due to the scoping of this project it was decided not to elaborate on the risk management approach in further detail. This would be scope creep that did not fit in the original plan.

Unimplemented feedback
During the evaluation sessions, different points of improvement have been identified of which the most critical points have been implemented. The criticality of the feedback has been valued based on several aspects, viz. functionality, usability, impact/effort ratio estimate of design changes. The feedback that has not yet been implemented is stated in the recommendations section and is meant for further development of this toolkit (see Chapter 8.3).

8.2 Conclusion

8.2.1 Design Goal
I started this project with the following research question in mind:
“How can we design a tool that supports researchers who use introspection as a method to assess the ethical risks and opportunities of their introspective research and manage these throughout their study?”

Through literature and empirical research, the following design goal was then formulated:

Design Goal
To design a tool intended to assist research practitioners engaged in introspective methodologies, in the identification and management of potential risks. This tool would encompass the safety considerations pertaining to themselves and their subjects. Simultaneously, this tool would facilitate the optimization of potential opportunities that introspective study presents, thereby maintaining an effective equilibrium between risk management and opportunity exploitation.

Through prototyping, testing and evaluating the toolkit, the fulfillment of this design goal was assessed. The assessment of the toolkit shows that the toolkit provides valuable guidance for researcher practitioners to minimize the risks of their study, while maximizing the opportunities.

Using the different tools to understand, identify and manage the risks of their study, researchers can prevent unnecessary harm to themselves. Researchers are also encouraged to consider the potential risks to those they refer to in their study.

Simultaneously, the toolkit facilitates consideration of opportunities, which helps them become aware of what they want to get out of their research. They are also encouraged to think about how they can enhance their opportunities.

The different evaluation sessions indicated that the design goal was reached. A proper validation can only be achieved by use of the toolkit by the target group in real research circumstances.

8.2.2 Design Subgoals
In this project, three key problems have been identified that withhold introspective researchers from engaging in active responsible research practice. These problems are addressed through 3 design subgoals:

Design Subgoals
1. Increasing awareness and understanding
2. Encouraging to look ahead
3. Facilitating risk and opportunity management strategies

Ad 1: Through the risk & opportunity overview poster and R&O cards, researchers are made aware of the different risks and opportunities. The vignettes help them relate to these by placing them in a design-related context.

Ad 2: The activities encourage them to think about the r&o in their own project context. They are then encouraged to think about the impact on their wellbeing, using the risk matrix and risk tables.

Ad 3: Lastly, the activities provide guidance in risk and opportunity management by proposing risks management strategies (accept, mitigate, avoid) and opportunity enhancement. The toolkit facilitates management, but does not tell you explicitly what to do. Some researchers stated they could benefit from more specific predefined strategies that is not included in this toolkit. To process the results of the activities, researchers can use the worksheet. Finally, the DIY poster helps researchers to make a visual summary of their learnings, which they can use to remind them throughout their project.

8.2.3 Design Requirements

Below, the seven design requirements are discussed and assessed on whether they have been achieved through the toolkit design.

Checkmark Legend:
- Part of the design
- Possible with the design
- Not possible with the design

1. Risk Awareness

"It makes you aware of all the different types of risks and opportunities. Which is good, because it's probably something you wouldn't think about otherwise." - Evaluation P2

The toolkit is successful in making researchers aware of the different risks of introspection. Evaluation shows that the vignettes highly contribute to this awareness, by increasing knowledge on what risks (and opportunities) can happen in different situations.

2. Risk Strategies

"It really facilitates risk and opportunity management, but it's still something that needs to come from yourself in that sense." - Evaluation P1

Two of the three individual participants who evaluated the toolkit agreed that the toolkit provides valuable guidance in managing risks and opportunities, but that it still has to come from yourself. The toolkit does not provide actionable strategies, but strategies that have to made actionable by the researcher themselves.

3. Opportunity Optimization

Researchers feel like they are made aware of opportunities and get to identify them in their project. However, the strategies for opportunities are also rather a direction than actionable strategies.

4. Reflexivity and Self-Reflection

"By using this toolkit, you reflect on your own research and risks connected to your wellbeing. For example, I think social risk is very connected to my wellbeing." - Evaluation P3

Researchers liked the way the activities are structured, and how it guides them through a reflection process. Besides, the DIY Poster encourages researchers to keep reflecting on the content throughout their project. This was also evidenced by the evaluation with the project kickoff participants, who asked if they could keep the poster to use it for reflection later in their process.

5. Engaging/Inviting

"It was a nice interaction and also the visual presentation is very good, very pleasing." - Evaluation Supervisor

The evaluation proved that the visual quality and pleasant interaction with the toolkit make using it an engaging experience. The participants expressed that they would be intrinsically motivated to use this toolkit when choosing to use introspective methods. Furthermore, all participants would recommend this toolkit to others.

6. Time-efficient

"Yes, I think one hour, one and a half is enough. It would be even more enough if we had read before." - Evaluation Supervisor

The participants agreed that the toolkit was time-efficient, especially considering the amount of new information that the toolkit presented. One participant estimated using the toolkit (collaboratively) in one to one and a half hour. The participants liked that they could make the process even more efficient by using the Activity Quickscan.

8. DISCUSSION, CONCLUSION AND RECOMMENDATIONS

7. Facilitate individual use as well as collaborative use

"I also like how this toolkit is very flexible. I can adapt it to my own needs. If I'm in a very anti social mood, it's still going to work. And also if I only want to focus on the risks, it's also flexible." - Evaluation P1

The participants who tested the toolkit in an individual setting all mentioned that they thought it would be even nicer to do it in a collaborative setting. However, they also liked that they could use it individually if needed. The participants who used the toolkit collaboratively during their project kickoff were enthusiastic about the collaborative qualities of the toolkit. They expressed that the toolkit facilitated a nice interaction for them as a team. They also had some ideas for improving collaboration, these are discussed in section 8.3.

8.3 Recommendations

Below, 10 recommendations are proposed for further development or implementation of the Toolkit. For each recommendation, its goal is explained as well as the reason for the recommendation. The recommendations are centered around the following topics: collaborative use, content, form, research, testing and user interaction.

Table 8.1 | *List of recommendations*

Recommendation	Goal	Why
Collaborative use: Optimizing the toolkit for use in a workshop setting	Increasing the value of the toolkit, and the probability of researchers using it	During the evaluation with end-users (chapter 6.2), users mentioned they would like to use this in a workshop setting
Collaborative use: Adding role cards that assign different roles when using the toolkit collaboratively	Improving the social dynamics when using the toolkit in a collaborative setting, especially within new groups	This point was raised by the participants who used the toolkit during their kickoff meeting in chapter 6.4
Content: Expanding the toolkit with an element of research topic consideration	To support researchers in their topic choice before starting an introspective study.	Empirical studies showed that topic consideration has a large impact on the type and amount of risks happening (chapter 3.3 and 3.4)
Content: Consider addressing indirect risks	To increase researcher's insight into different risks and their relations	Point of discussion raised in the discussion subchapter (chapter 8.1.2)
Content: Making the R&O strategies even more specific	Providing more guidance in creating effective risk and opportunity management strategies	Recommendation proposed by end-users during the prototype evaluation (chapter 6.2)
Form: Making a digital version of the toolkit	To increase the accessibility and availability of the toolkit	Recommended way of dissemination as proposed for the final design (chapter 7.2)
Research: Researching how the type of data collection influences the perceived risks (and opportunities)	Understanding their relation might help researchers make more deliberate decisions on which data collection technique to use	One of the insights of the introspective self study (3.4.4) showed an opportunity for researching the link between way of data collection and perceived risks
Testing: Testing the toolkit in different collaborative settings	Verifying the value of the toolkit for collaboration	Point of discussion raised after testing the toolkit in a single collaborative setting with a supervisor and student (chapter 6.4)
Testing: Testing the toolkit on a larger group of participants	Generalizability of the results	Study limitation raised in the discussion subchapter (chapter 8.1)
User interaction: Poster as Magnetic board	Improving the interactivity of the DIY Poster, as well as promoting repeated use of the toolkit	Suggestion of a participant who tested the toolkit during their project kickoff (chapter 6.4)

Continued on next page →

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8.4 Personal Reflection

This project has been a great learning experience during which I could not only prove the worth of my design education so far, but also learn new things and gain new skills. Starting this project, I formulated three personal ambitions for this project. First, my aim was to gain more confidence in leading my own project and making decisions. Second, I wanted to develop my visual design skills. Last, I wanted to design something that would reflect how I see myself as a designer: organized, communicative, and research-minded. Below, I reflect more in depth on my personal learnings.

My first aim was to grow more confident in leading my own project and especially in making design decisions. Looking back on the project's evolution, it's clear that I have made significant steps in this aspect. The numerous decisions that had to be taken in this project, from defining the research question to shaping the toolkit's design, were all small opportunities for me to exercise my decision-making skills. Towards the end of the project, I experienced a growing sense of confidence in my ability to assess situations, weigh options, and make choices that steered the project in the right direction.

My second aim was to develop my visual communication skills. During my master in Delft, I experienced the importance of the way you present documents or artefacts first hand when I failed one of my very first assignments for a lack of visual style. I later rekindled my passion for drawing during some elective courses. This made me eager to learn how to implement this throughout a design project. Visualization turned out to become an essential part of my final design to present information in an understandable and engaging way. Through this project, I have truly discovered a new strength of myself as a designer.

Lastly, I wanted to design something that would reflect how I see myself as a designer: organized, communicative, and research-oriented. One of my strengths as a designer is that I like to organize information and create overview. My organizational skills proved to be of good use during this project. I stuck to a tight schedule, redirecting the planning where needed. This resulted in reaching all checkpoints in the scheduled time. However, this project also provided a good organizational challenge: I was dealing with a lot of (new) information, part of it in the field of ethics which can be abstract at times. From the start, I tried hard to organize the information and make new links. However, I was not quite hitting that spot where all information comes together and makes sense. I learned that this sensemaking can take a while, and that that is OK. Rather than spending five days full time on forcing a new framework, I learned that it is more helpful to take some distance one in a while.

The project has resulted in a structured toolkit with a solid foundation in research, that communicates content through a strong visual style. Furthermore, this project allowed me to make a practical design with a real-world application. All in all, I am convinced that the final design is a good reflection of my professional identity as a designer.

Beyond the realm of these three ambitions, this project has also allowed me to sharpen other skills and knowledge. I gained a lot of knowledge about introspective methods and research ethics, tried new ways of doing empirical research (focus groups and evaluation through roleplay), met new people, learned new ideation methods (using ChatGPT), became a pro in making vector illustrations, learned everything there is to know about paper prototyping and printing specifications, and even learned to make video animations.

Completing my Master's program with such a fun and interesting project was truly rewarding. I am grateful for the new knowledge, insights, and skills that this project provided. On to the next design adventure!

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Appendices

A. Original Project Brief (Redacted)
B. Self Study Diary
C. Computer-Mediated Ideation Heuristics
D. Outcomes Individual Idea Generation #3 Mapping Extremes
E. Set-up Evaluation Sessions (Individual, Kickoff, Expert)
F. Low-level Discussion 3.2

TU Delft

Designing for ethics in researcher-introspection

project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date 24 - 04 - 2023 12 - 10 - 2023 end date

INTRODUCTION **

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

• Context

Many studies in the domain of Industrial Design Engineering involve research with Human Research Subjects (meaning, where human participants are (partly) the source of the research data) (TU Delft, n.d.). Nowadays, more and more attention is being paid to ethical underpinning of the research approach that is being followed to avoid undue harm. Typical ethical challenges are informed consent, anonymity and confidentiality (Sanjari et al., 2014). Researchers carry a responsibility to take Research Ethics into account when designing and executing a study, to make sure that participation in a study is voluntary, informed and safe for participants. This usually involves anticipating and minimizing risks, communicating this to participants through informed consent, and managing risks throughout the study.

• Researcher-introspection

However, how does this work when the researcher is the participant in their own study? Introspective or first-person methods (e.g. autoethnography) have gained increasing popularity in design-related fields, and provide researchers with a powerful approach to investigate their own subjective experiences (Xue & Desmet, 2019). However, this type of method has its challenges. Introspective methods hold that the researcher has a dual role, they are both researcher and researched, i.e. "researcher-introspector" (Gould, 1995; Woodside, 2014). This puts the researcher in a vulnerable position, and brings along unique challenges and risks (e.g. wanting to deliver good research while maintaining your boundaries, being "authentic", permanent records of once private feelings and thoughts that once set in motion cannot be revised, blurred distinction between work and personal life, tension on relations, …). Furthermore, sharing of first-person accounts also raises ethical concerns regarding the potential impact towards closely related people (Helms & Fernaeus, 2021). Personal experiences often involve interactions with others, however, these people may have no say in what is made public.

• Need for additional measures

Why don't researchers simply follow the ethical procedures of their institutions? Researcher-introspection has a tense relationship with ethical boards. On one hand, introspective methods are used by people who want to avoid ethical approval committees on purpose, e.g. when they want to research a sensitive topic (e.g. anxiety) that is hard to get approval for. Introspection can be "the way out", because you don't have to put others through risk. An example of this can be found in the study 'Lickable Cities': "Moreover, it was impractical for us to get ethical approval for any Lickable Cities studies involving other people. We could not guarantee their health and safety; we could only consent to risking our own" (Brueggemann et al., 2018) . It almost seems as if researcher-introspection has become a free pass for research that pushes the boundaries of what is responsible. On the other hand, ethical boards of institutions don't always provide ethical guidelines regarding this specific method. The universalization and standardization of best ethical practices can limit and restrain qualitative research, including introspective research (Helms, 2022). Therefore, there is need for additional measures that help researcher-introspectors to deal with risks and avoid undue harm.

• Problem summary

There's an urgency to make measures available that address the need described above, because introspective methods are growing in popularity, but more attention needs to be paid to the ethical risks. Researchers should have the means to protect themselves and others from potential risks of introspective studies, and this should be central to the research design.

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introduction (continued): space for images

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PROBLEM DEFINITION **

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

There are unique challenges and risks involved in researcher-introspection (researcher vulnerability, writing about others). To avoid undue harm to self and others, it is important that researchers have the right tools to consider ethical risks and set limits. Therefore, in my project I aim to answer the following research question:

RQ: How can we design a tool that supports researcher-introspectors to assess the ethical risks of their introspective research and manage these throughout their study?

I will address this question by answer the following sub questions:
Q1: What are the main ethical risks (for self and others) that researcher-introspectors encounter during their study? How do researchers currently deal with these risks? How do researchers experience these risks? What are the responsibilities of researchers?
Q2: What do researchers need and want to be able to assess and manage risks? What are additional requirements?
Q3: How can these requirements be translated into a tool that supports researchers to perform their research in a responsible way?

ASSIGNMENT **

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, ... In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

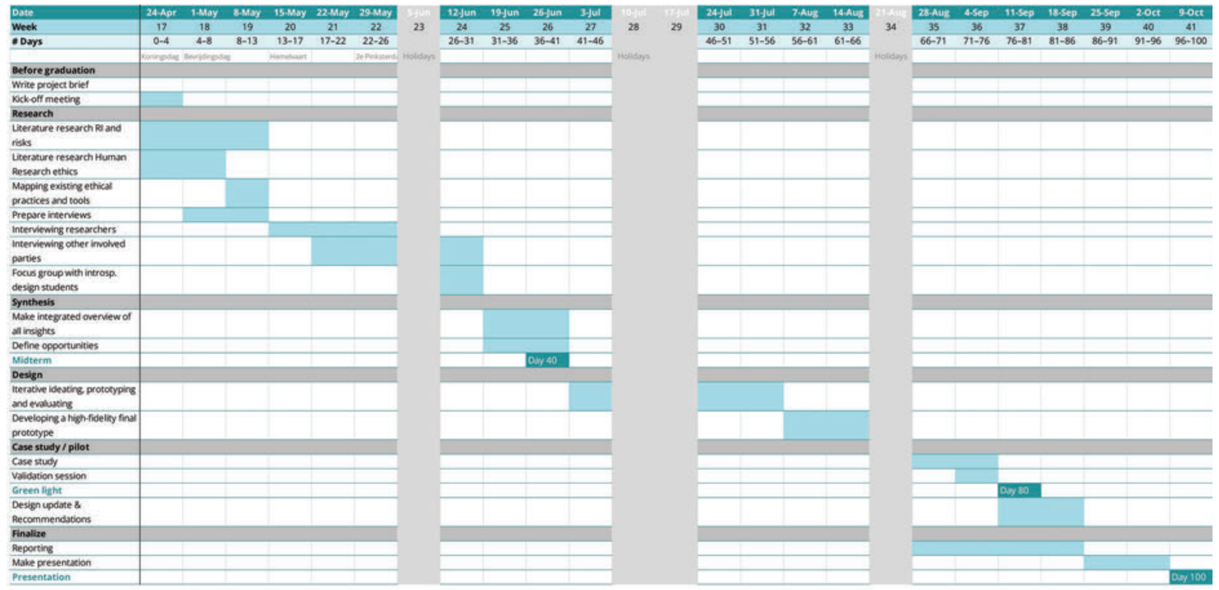
The goal of this project is to design a tool that supports researcher-introspectors to consider potential risks and set limits for their research. It is important that researchers have the means to set up and carry out their introspective research in a responsible way, including consideration of responsibilities and risks, for self and others. This should not feel like an added burden to the researcher, because this might discourage researchers from using it.

At the end of my project project, I will provide:
• new insight into the ethical risks of researcher-introspection
• the design of a tool specifically for researcher-introspectors to enable them to assess and manage risks throughout their research
• A description how the tool can be applied

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date 24 - 4 - 2023 12 - 10 - 2023 end date



I will approach the project by combining knowledge and insights gained from literature research and individual interviews with researchers (varying in levels of experience, backgrounds) and other relevant parties (e.g. ethical risk experts, HREC), and a focus group with students who have followed introspective design elective. From these activities, I want to find out in detail what the current situation is like and what would be the desired situation. After this research stage, I will gather all insights to create an overview (e.g. a conceptual framework) of the main risks and responsibilities of researcher-introspectors. Furthermore, I will map their needs, wants and other requirements.

In the next stage I will iteratively ideate, prototype and evaluate towards a final concept. I will then make a high-fidelity final prototype which will be tested and validated during a case study. I will use the outcome to make a design update and draw up recommendations.

MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, ... Stick to no more than five ambitions.

• Motivation

I set up this project because I developed an interest in introspective methods over the course of my master. This type of method inspires me because of its appreciation for the felt experience. I believe that introspective methods, in combination with design, open up new dimensions with regard to researching experiences. This relates to my motivation for studying DFI in the first place. I am interested in how people experience things, and how we might change it for the better.

This graduation topic is a perfect match for me because it aligns with my previous experience and ambitions. I have gained relevant experience in design research and knowledge on introspection when writing a paper for the CC course and during the research project on researcher-introspection in my elective space. Furthermore, I have filled my elective space with courses on ethics at the TU/e, and worked on project around consent for the ITD course.

• Personal ambition

I see this project as a great opportunity to learn how to integrate my theoretical knowledge on ethics and experience with research in a design project. On top of the learning objectives of the Graduation Project, I aim to become confident in leading my own design project. Besides, I want to use this project to develop my visual communication skills. Lastly, I want to further develop my unique design signature, and finish my Master's with a project that reflects me as a designer: research-oriented, communicative and organized.

FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.

Appendix B: Self Study Diary

Daily Diary Prompts introspective Self Study

Q1: How do you feel right now?

Q2: What type of communication took place today, how often and for how long?

Q3: How do you feel about this?

Q4: What was said?

Q5: How do you feel about this?

Q6: What thoughts did you have about communication with your partner today?

Q7: Is there anything else you want to write down?

Appendix C: Computer-Mediated Ideation Heuristics

Input Question

Hi there! Could you please come up with a list of 10 design heuristics based on design evidence from the field of tools for identifying and mitigating ethical risks? The design heuristics should address either functionality, form, or user-interaction features.

ChatGPT

As an AI language model, my responses are generated based on a mixture of licensed data, data created by human trainers, and publicly available data. However, I don't have access to specific design evidence from the field of 'tools for identifying and mitigating ethical risks' or real-time research findings.

Nevertheless, I can provide a list of design heuristics that are generally relevant to the development of tools for identifying and mitigating ethical risks, drawing from established principles in the field of research ethics and responsible design practices. While these heuristics are not based on specific design evidence, they align with common ethical considerations for such tools. Here's the list:

1. User-Centered Interface: Functionality: Design an intuitive and user-friendly interface that guides users through the process of identifying and mitigating ethical risks. Form: Use clear and concise language, visual cues, and interactive elements to enhance user engagement and comprehension. User-Interaction: Provide step-by-step guidance and interactive prompts to assist users in addressing specific ethical considerations.
2. Comprehensive Ethical Framework: Functionality: Develop the tool based on a comprehensive ethical framework that covers a wide range of ethical risks and considerations. Form: Present the ethical framework in a structured and accessible format, allowing users to easily navigate different ethical domains. User-Interaction: Enable users to customize the tool's parameters based on their specific research context and needs.
3. Risk Assessment and Mitigation Support: Functionality: Incorporate functionalities that aid users in conducting ethical risk assessments and identifying appropriate mitigation strategies. Form: Offer decision trees, flowcharts, or risk matrices to help users navigate complex ethical dilemmas. User-Interaction: Facilitate real-time collaboration and feedback between users, ethics experts, and stakeholders during the risk assessment process.
4. Data Privacy and Security Features: Functionality: Implement robust data privacy and security features to protect users' sensitive information and ensure compliance with data protection regulations. Form: Clearly communicate data handling and storage practices to users, including encryption and secure data transfer. User-Interaction: Allow users to manage access controls and permissions for sensitive data within the tool.
5. Transparent Ethical Documentation: Functionality: Provide options for transparent documentation and reporting of ethical assessments and mitigation strategies generated by the tool. Form: Design standardized and customizable reports that can be shared with ethics committees, stakeholders, and participants. User-Interaction: Encourage users to review and validate the documentation generated by the tool to ensure accuracy and accountability.
6. Real-Time Ethical Feedback: Functionality: Integrate mechanisms for real-time ethical feedback and reminders within the tool to promote ongoing ethical reflection. Form: Offer pop-up notifications or alerts to prompt users to consider ethical implications during different stages of research. User-Interaction: Encourage users to record reflections and considerations as they progress through the research process.
7. Training and Educational Resources: Functionality: Include training resources and educational materials on research ethics within the tool to support users' understanding of ethical principles. Form: Offer interactive modules, tutorials, or links to relevant research ethics guidelines and literature. User-Interaction: Encourage users to participate in educational modules and seek further information on ethical considerations.
8. Collaboration and Consultation Features: Functionality: Facilitate collaboration and consultation among researchers, ethics committees, and stakeholders directly within the tool. Form: Provide communication channels for users to seek advice or share ethical challenges with others. User-Interaction: Encourage users to engage in collaborative discussions and seek expert guidance when needed.
9. Version Control and Audit Trail: Functionality: Implement version control and an audit trail to track changes and updates made to ethical assessments and mitigation strategies. Form: Display a history of modifications and updates to the tool's content for accountability and transparency. User-Interaction: Allow users to access previous versions of assessments and strategies for review and comparison.
10. Accessibility and Inclusivity: Functionality: Design the tool to be accessible and inclusive to users with diverse needs and abilities. Form: Consider compatibility with assistive technologies and adherence to accessibility standards. User-Interaction: Incorporate user feedback and conduct usability testing to ensure the tool's usability across different user groups.

These design heuristics aim to create tools that assist researchers and other stakeholders in identifying and mitigating ethical risks effectively. However, it is crucial to keep in mind that specific design choices should be informed by research evidence, usability testing, and ongoing feedback from users to optimize the tool's effectiveness and usability in practice.

Appendix D: Individual Idea Generation #3 Mapping Extremes

Results

1. Doing nothing

One extreme way of dealing with ethical risks is... well, doing nothing. Not engaging in any form of active risk prevention or mitigation might turn out fine for you. Risks are after all risks because they MIGHT happen, but they might as well not. In the best case scenario, you have saved yourself time and energy. In the worst case, you encounter risks that cause actual harm to self or others. Causing harm to others is unethical, causing harm to yourself is disputable.

Qualities: Easy, saving time and energy, relaxed

2. Serious and analytical (FMEA)

FMEA — failure mode and effects analysis — is a qualitative, systematic tool that helps to thoroughly identify potential problems and their impact (https://www.isixsigma.com/uncategorized/fmea-quick-guide/). It is seen as “one of the best ways of analyzing potential reliability problems early in the development cycle, making it easier for manufacturers to take quick action and mitigate failure”. FMEA can be executed blitz-style, getting it done in one, two, three days, whatever it takes, but might also be executed parallel to the product development process (https://www.techbriefs.com/component/content/article/tb/stories/blog/33462).

Qualities: Serious, analytical, thorough, lots of text

3. Making it “fun” (gamification)

With the rise of gamification, risk management of course couldn’t stay behind. Different risk management games can be found online, all aiming to make risk management more engaging, collaborative and interactive. This can be achieved through e.g. roleplaying scenarios and quizzes. Also, many games exists that aim to teach people about the importance of risk management such as using Jenga and additional prompts (https://www.proquest.com/openview/97a434654b279861b-fe59d638f5c891a/1?cbl=47628&pq-origsite=gscholar&parentSessionId=acFClurSxdpO8AWVeQuVbZptAzwNUJZPXbhDv-jeGo7M%3D).

Qualities: Interactive, collaborative, engaging

4. Keeping it simple (risk assessment for kids)

Another extreme might be found in risks assessment tools for kids. An example of this is risk templates that are used for kids of primary school age to assess the potential risks of playing outside on the playground. The templates basically depict a situation, maybe a short description, and a checkbox for whether kids consider this situation safe or unsafe. In terms of risk awareness, this tool seems to be practical and straight to the point. (https://www.twinkl.nl/resource/t-c-7150-indoors-and-outdoors-child-friendly-risk-assessment-pack) (https://www.twinkl.nl/resource/safe-or-unsafe-activity-sheets-us-he-91)

Qualities: Simple, visual, quick, not very thorough

Appendix E: Setup Evaluation Sessions

1. Individual Evaluation

Part I: Validation (Usability + Desirability Testing (Lab))

Goal:

1. How do users interact with it
   - To understand how real users interact with my tool (and why)
   - To understand the added value of the product and the features that add most value
   - To identify pain points / points for improvement
2. How do users like interacting with it (desirability/satisfaction)
   - To what extent does it fulfil their needs?
   - How likely are they to use this in a project?

0. Explain testing

- Today you will test the prototype I have made for my graduation project.
- The goal of this prototype is to help introspective researchers understand, identify and manage risks and opportunities. This way they can maximize the benefits of the study, while minimizing the potential harm.
- The testing consists of two parts. In the first part, I will give you a scenario in which you are the researcher. I will then give you specific tasks. I will observe as much as possible, and ask a few questions if needed. Afterwards, I will ask you more questions about your experience.
- The second part I will explain later, but it will be much shorter.

A. Introduction

Participant Introduction Questions

1. To get started, can you tell me briefly about yourself?
2. What is your current occupation?
3. How much do you know about the risks and opportunities of introspective studies?

B. Scenario and Tasks

Scenario: “You are a researcher who is planning to do an introspective project. In your project, you will introspect on a feeling that is universal, that everyone has experienced: the feeling you have when you are rejected. It can be rejection from a romantic partner, or a friend. Your goal is to introspect on this feeling, to gather insights, which you can use to design something for people who feel rejected. Do you have any questions about this?

For the sake of this test, it would be good if you can recall one or two memories of rejection. You can keep them to yourself, or share them with me. ”

Tasks per subgoal: Realistic tasks that the user would perform in real life
P1: Activity A (Vignette 1 and 4), D, F
P2: Activity B (Vignette 2 and 5), C, E, F
P3: Activity B (Vignette 3 and 6), C, E, G

While doing this test, can you think aloud as much as possible?

Subgoal 1 + 2: Does the tool increase awareness and understanding? Does the tool encourage to identify r&o in your own study?
Task 1: Can you go to Activity A (or B)?
Task 2: Can you execute the activity?
If participant performed Activity B > Task 3: Can you go to Activity C?

Subgoal 3: Does the tool facilitate r&o management strategies?
Task 1: Can you go to Activity D (or E)?
Task 2: Can you execute the activity?
Task 3: Can you go to Activity F (or G)?

Task 4: Can you execute the activity?

C. Questions during Tasks (Usability)
Note to self: keep questions here minimal, don't interfere too much.

1. Questions for Observed Behaviors
What are you thinking as you view [specific feature]?
If you were looking for [information], where would you expect to find it?
How was the experience of using the product to complete this task?
[Probe:] What are your thoughts on the language used?
[Probe:] How easy or difficult was it to navigate?
[Probe:] What are your thoughts on the design and layout?

2. Questions to understand motivations
Why did you go to [feature A] instead of [feature B]?
What motivated you to do [specific interaction]?

D. Questions After Tasks (Desirability)
Post-testing usability questions
1. What do you think of the product looks and interaction?
2. How would you describe your overall experience with the toolkit?
3. What did you like the most about using this toolkit and what did you like the least?

Post-testing Desirability questions
1. How do you think using this toolkit would impact your study?
2. Would you use this toolkit if you were to do an introspective study?
   a. If yes, what motivates you to use it?
      i. How often would you use it?
      ii. Under what circumstances would you use it?
   b. If no, what discourages you from using it?
3. Would you recommend this tool to others? Why?

Part II: Verification

Goal: Find out to what extent the design requirements and subgoals are fulfilled.
- 10 cards (7 requirements + 3 subgoals)
- The cards are placed on a table in a random order.
- After the interaction, the participant is asked to pick the cards that reflect their experience with using the product. (No specific number is requested)
- The participant is interviewed. They are asked to explain why they chose the specific cards as a reflection on the experience with the product, and follow-up questions are asked.

Questions:
1. Why did you choose these cards?
2. Why did you not choose the other cards?

2. Kickoff Evaluation

Goal: Testing the toolkit in a real life setting, observing how they use it / how the toolkit can be used collaboratively, evaluating the toolkit on desirability and usability

Important things
- In-person and in-context naturalistic observation
- Telling them they can pretend you are not there

Questions for observations
- Why did you do X?
- What motivated you to do X?

Post-testing usability questions
1. What do you think of the product looks and interaction?
2. How would you describe your overall experience with the toolkit?
3. What did you like the most about using this toolkit and what did you like the least?
4. How did you experience the collaboration with each other while using this toolkit?
5. What could be improved to improve collaboration?

Post-testing Desirability questions
1. Do you think using this toolkit impacts your study? If yes, how?
2. Would you use this toolkit again if you were to do an introspective study?
   a. If yes, what motivates you to use it?
      i. Would you use it at the project kick-off or do you think another moment would be suitable?
   b. If no, what discourages you from using it?
      i. Do you think another moment in the process would be more suitable?
3. Would you recommend this tool to others? Why?

2. Expert Evaluation

Goal: to assess the desirability of the toolkit, from a more zoomed out perspective. Not from a user perspective, but from a perspective of a researcher who knows more about research methods in this faculty.

Introduce toolkit presentation
Is anything unclear?

1. What is your overall impression of this toolkit?
2. What is good about it? What could be different/better?
3. Do you think using this toolkit contributes to responsible practice, as it says in the title?
4. Target group: designed for researchers who are new to this method - does it suit that group in your view? Could it also be used by more experienced researchers at the start of a project?
   a. Do you think it is suitable for beginning researchers (little research experience in general)?
5. The idea behind the activities is that they can be executed individually but also together with others. What do you think about this? What do you think is more valuable, and what do you think researchers are more likely to do?
6. Ease of use/ engaging / time-efficient?

___
7. Does you know of other tools for reflective introspection? How does this tool compare to them?
8. Do you see an added value and if so, explain?

___
9. Would you recommend this tool (scale of 1-10 probability) to students/researchers- why/explanation?
10. Do you see any barriers for this being adopted?

Appendix F: Low-level Discussion 3.2

Discussion relating to Chapter 3.2

The focus group process and outcome raised some low-level points of discussion. These are described below.

The goal of doing a focus group was to encourage an exchange of ideas between the different participants. Since the 3rd participant cancelled the focus group last minute, this participant was spoken to at a later moment in an individual setting. This means that there was less opportunity for cross contamination of thoughts and experiences. However, there was more time to go a bit deeper into certain topics.

When discussing the risks that the participants had experienced through the risk cards, they were also encouraged to come up with other risks that I might not have found in literature. The participants did not add any risks. It appeared to be difficult for the participants to add new risks, which could be due to different reasons (they did not recognize risks as risks, they only had limited time during this session, ...). This also goes for the interviewed researchers in Chapter 3.3.

Master Thesis
By Katelijn van Kooten

October 2023

TU Delft