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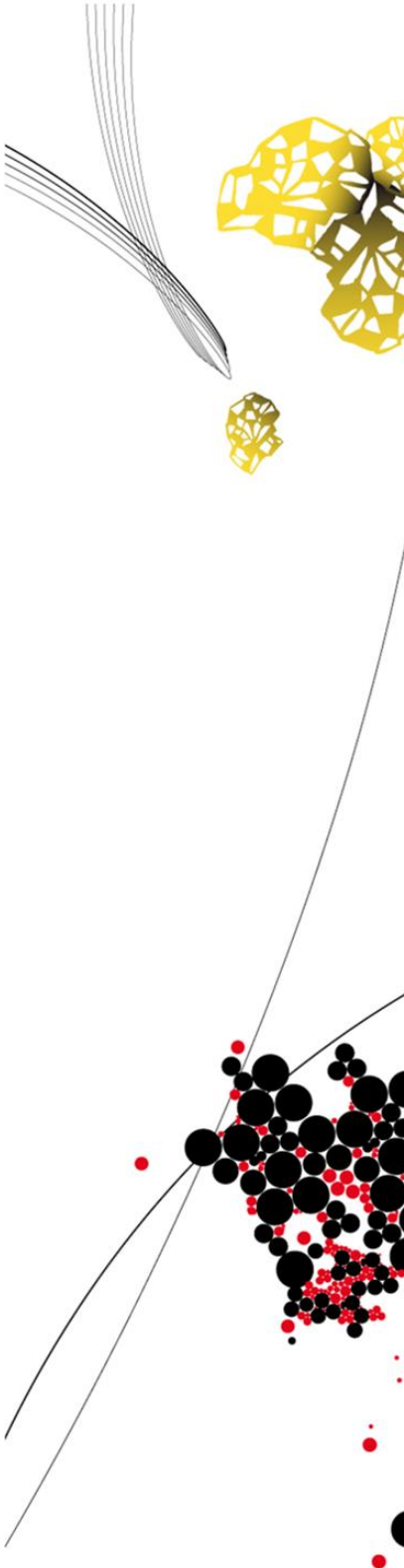
Bachelor's Thesis

**How do Attitudes on Free Will
Relate to Students' Imagination
of the Future?**

Positive Psychology and Technology

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HOW DO ATTITUDES ON FREE WILL RELATE TO STUDENTS' IMAGINATION OF THE FUTURE?

Abstract

Introduction. The debate about whether free will exists or not has always been a controversial issue in Philosophy. Lately, psychologists have started to explore what effects different attitudes on free will have on people. Research suggests that the disbelief in free will induces more passive, antisocial and unethical behavior in humans. On the other hand, belief in free will has been shown to be associated with increased life satisfaction, more helping behavior and sociality overall. This study takes a qualitative approach using narrative futuring to explore how different attitudes on free will relate to students' imagination of the future.

Methods. Fifteen students from the University of Twente were randomly assigned to one of three groups (indeterministic, deterministic, control) and primed accordingly concerning the intended attitude towards free will. They asked to engage in a guided mediation and to write a letter from the future to their present self. Additionally, the participants were asked to report their perceived freedom and perceived likeliness of the future to actually occur. The letters were coded both inductively and deductively, resulting in a coding scheme consisting of the three main codes *Connection*, *Agency*, and *Fulfilment/Happiness*, in terms of which the letters were then analyzed.

Results. The most prevalent theme was *Connection*, which was almost equally as present in the deterministic and indeterministic condition. In the deterministic condition, *Valuing family members* and *Working for the greater good and personal fulfilment* were most present, whereas *Finding meaning in friendships* was especially important in the indeterministic condition. Within the theme *Agency*, *Continuation of the past* was the most prevalent theme in the deterministic condition, whilst for the indeterministic condition, *Taking ownership of one's actions and achievements* had the highest frequencies. Additionally, the prevalence of *Fulfilment/Happiness* did not differ significantly between the conditions. Lastly, perceived freedom was higher in the deterministic than in the indeterministic condition, whilst perceived likeliness was higher in the indeterministic than in the deterministic condition.

Discussion and Conclusions. This study shows that attitudes on free will have an influence on how students imagine their future, particularly concerning the themes *Connection* and *Agency*, which can be related to the basic motives of human existence, *Connection* and *Agency*. Further research is suggested regarding the overall generalizability and validity of the findings.

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Introduction

In the Netherlands, over 700,000 students are enrolled in 13 research universities and 39 universities of applied sciences (“Key Figures 2015”). For those students, their next significant achievement will be graduating from university and pursuing their dreams. As exciting and pleasant as this may sound, a wide range of choices also induces a high level of stress in people facing those seemingly infinite options and therefore decreases wellbeing (Schwartz, 2004). In making choices for the future, they are influenced by a range of different factors, such as wanting to satisfy their parents’ expectations (Agliata & Renk, 2007), seeking approval from peers (Nisen, 2014) and probably most importantly, wanting to satisfy their own needs (Feldmann, Chandrashekar & Wong, 2016). When wanting to satisfy one’s own needs, the ability to cope with decision situations is crucial, which has been shown to be aided by belief in free will (Monroe & Malle, 2010). Although modern humans value free will as one of the highest privileges, the ongoing philosophical debate shows that free will might not even be real. Therefore, as shown by research, making choices is likely to be significantly influenced by particular attitudes on free will. Since the role of those attitudes in future imagination have been largely neglected by research, this paper aims at exploring how different attitudes on free will relate to students’ imagination of the future.

As indicated above, the philosophical debate about the existence of free will has been around for about two millennia and has been discussed by most of the greatest philosophers of all time, such as Kant, Plato, Aristotle and Descartes (Stanford Encyclopedia of Philosophy, 2002). This provides evidence for the fact that the free will debate is far more complex than some might expect. The most prevalent positions on this issue can be described as Libertarianism, Soft Determinism, and Hard Determinism, which will be briefly explained in the following.

Libertarianism rejects the principle of universal causation, which means that it asserts some actions are free from causal necessity. This implies that, from a libertarian perspective, people can act freely without being driven by factors from the past that guide them in their actions (Fischer et. al, 2007). The first main argument that this stance uses to strengthen their position is the argument from experience, which says that when making a decision, people have the active experience of making that decision and thus, having free will. From this, most libertarian philosophers draw that free will must exist. Secondly, they often argue that without free will, people would have no moral responsibility, which is sometimes presented as an argument that free will is not an illusion (Vuletic, 2019). In contrast to libertarianism, soft determinism accepts the principle of causal determinism and thus, accepts the assumption that

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there is no such thing as actions that are free from causal necessity. What makes this position unique though, is the fact that it rejects the principle of incompatibilism, which asserts that determinism is incompatible with free will (Fischer et. al, 2007). Therefore, most soft determinists view actions as free as long as they are caused by internal psychological states of the agent, which allows for the existence of free will whilst accepting the principle of causal determinism (Vuletic, 2019). Lastly, hard determinism asserts that all of our actions are causally determined and denies that people are morally responsible for their actions (McLeod, 2019). In contrast to soft determinism, it advocates incompatibilism, which means that determinism is not compatible with freedom of the will (Fischer et. al, 2007). One of the arguments voiced by some hard determinists is the fact that every event is causally determined by prior events and human actions qualify as events. Therefore, human actions are thought to be causally determined by prior events too (Vuletic, 2019).

What now seems like a rather theoretical and abstract issue almost exclusive to experimental philosophy has been getting a lot of attention in both neuroscience and social psychology. Interestingly, neurophysiology was able to prove through various experiments, that some decisions happen to be made within the brain before the subjects were even conscious of that decision being made (Libet, 2002). Experimental philosophers have focused on the laypersons' thoughts about free will and whether determinism and free will are compatible or not whilst social psychologists sought to get insights on broad beliefs about both indeterministic and deterministic beliefs and how those influence behavior and cognition.

In order to get a clearer understanding of the results that social psychology has achieved in terms of people's perception of free will, it is crucial to understand what laypeople understand as free will in the first place. Monroe and Malle (2010) found out that students perceive free will as doing things as they desire without external forces acting on them in the process of making an active choice. According to further research by Stillman, Baumeister and Mele (2011), this definition can be substantiated by the concepts of acting in order to achieve goals and positive outcomes, making choices that arise from deliberately reflecting on the options and behaving in a way that is in line with one's moral values. Interestingly, people characterize an action as free in a situation that involves external coercion, if that action goes against those pressures (Alquist, Ainsworth & Baumeister, 2013). Overall, it should be noted that most people have an indeterministic view, which means that they feel like they have free will (Baer, Kaufman & Baumeister, 2008).

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Further evidence against the postulate that the free will debate is purely of philosophical nature is the fact that different views on this issue induce different behaviors in the general population. According to research done by Vohs and Schooler (2008), participants who were manipulated to disbelieve in free will were more inclined to steal, cheat and lie in an experiment. These results were yielded through presenting an anti-free will text to one condition whilst the other functioned as a control condition. Across two different experiments, it was shown that unethical behavior was significantly more present in the deterministic than in the control condition. Further, disbelief in free will has been shown to increase overall aggressive and antisocial behavior in an experiment that had three conditions: deterministic priming, indeterministic priming and a control condition. The results showed that the participants that were subjected to the deterministic text stating that free will does not exist were significantly less likely to exhibit helping behaviors than those that experiences different priming (Baumeister, Masicampo & DeWall, 2009). Lastly, it is also associated with less prevalent moral attitudes and a decreased morality in people's behavior. This became evident in a study in which participants were introduced to either a deterministic universe, an indeterministic universe or a neutral one (Feldman & Chandrashekar, 2017).

On the other hand, increased belief in free will is associated with significantly more positive outcomes and better mental health. As research by Crescioni et al. (2011) states, higher belief that humans have free will is associated with increased life satisfaction, perceiving life to be more meaningful, and having more self-efficacy. Additionally, free will beliefs have been shown to be associated with more autonomy, less helplessness and more positive attitudes relating to making active decisions (Feldman & Chandrashekar, 2017). Contrary to the effects that disbelief in free will has on the function of a human being in society, belief in free will heightens the willingness to be a functioning citizen and committed part of society (Baumeister & Brewer, 2012).

Most importantly for this paper, it has been shown that attitudes on free will have effects on the actions themselves that people are making or planning to make. As Rigoni et al. (2011) found out, believing in the non-existence of free will is associated with inaction and passivity in actions, whereas believing in the existence of free will correlates with high levels of goal attainment (Stillman, Baumeister & Mele, 2011). This might be the case because for achieving high levels of goal attainment, one has to be able to dismiss readily available gratifications in order to pursue delayed ones, which is linked to self-control and therefore, to free will to resist those immediate gratifications (Stillman, Baumeister & Mele, 2011). This is substantiated by the finding that disbelief in free will limits efforts to engage in self-control

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(Alquist, Ainsworth & Baumeister, 2013). Another interesting finding is that people have been found to be more likely to conform to other people's opinions when reducing their belief in free will, which is due to the fact that it decreases the motivation to make efforts to act on their own volition and thinking. This goes hand in hand with the finding that people who believe in the existence of free will are likely to make efforts to engage in self-control and act upon their own volition (Alquist, Ainsworth & Baumeister, 2013).

Free will might not only have effects on current action, but also on the prospection of those actions that lay in our future. Seligman, Railton, Baumeister & Sripada (2013) went on to tie these two crucial aspects, prospection and free will, together and made an assumption about how they might be linked. According to their research, a free action is one in which the person evaluates a number of possible future courses of action and chooses to pursue one of those. In doing that, people gain a sense of will when they spontaneously and deliberately prospect an array of future possibilities, which is claimed to be free because the exploration of possibilities is in itself free. After settling on an outcome, it can be said that the choice that was made is one's own idea that's free in nature because it was produced without any coercion, compulsion or temptation. The main point that is made in this respect is the fact that prospection of future possibilities is assumed to be at the core of free will as we know it, because evaluating possible future outcomes is said to be free in itself (Seligman et al., 2013).

As these research findings suggest, the free will debate goes way beyond its philosophical boundaries and has a profound effect on people themselves and how they interact with others. Perceptions on free will have been shown to alter people's attitudes, behaviors and interactive styles whilst the effects on people's imagination of the future have gone mostly unnoticed. Since planning the future is a vital part of being a person, research on the role of free will concerning the future seems to be inevitably important to the debate, which has been strongly neglected this far. Since graduating from university is probably one of the times in which students are most concerned with planning their future, exploring whether students feel like they have free will with regards to that imagined future and how different attitudes on that question influence their imagined future seems very appropriate. With planning the future being a crucial ability that humans could hardly live without, it seems particularly important to investigate not only how different attitudes on free will change people's behaviors and attitudes, but also their perception of how the future will unfold. Therefore, this paper aims at exploring answers to the question: *How do attitudes on free will relate to students' imagination of the future?*

Methods

Data Collection

The strategy that was used in this qualitative research is “narrative futuring”, which has been developed by Sools and Mooren (2012) and aims at exploring how people imagine their future. In this study specifically, this approach has been paired with a more experimental methodology including three different conditions and the respective primers. The study was approved by the University of Twente BMS Ethical Committee with the request number 190400 on April 26, 2019 (see Appendix B).

Participants and Recruitment

The study was open to any students who were at least 18 years old. An inclusion criterion was a proficiency in the English language. For convenience reasons, the participants were mostly friends and fellow students of the researcher herself. The study included a total of 15 participants, who ranged in age from 20 to 25 years old with a mean age of 21.5 (SD=1.31). Of those 15 participants, 6 were female and 9 were male, all of whom are students at the University of Twente. Most of the participants were German (n=14) and one participant was Italian (n=1).

Procedure

The qualitative study consisted of three different parts: being exposed to a video, guided meditation, and writing a letter from the future. The participants were randomly assigned to one of three groups: indeterministic, deterministic and control. Firstly, the researcher presented the subject with the appropriate video. Secondly, the researcher played an audio that guided the participants through a meditation that allowed the participants to visualize their future and prepare for the act of writing the letter. After these five minutes of guided meditation, the participant was asked to start writing their letter from the future. The participant was given an approximate time frame of 20 minutes, which functioned rather as an orientation than as a rule. This time frame proved to be sufficient since most participants took about 15 to 20 minutes to complete the letter. Those who exceeded the given frame were not reminded of any time restrictions and were free to take as long as they wanted to. Immediately after the participants reported being done with writing their letter, they were asked two questions. Afterwards, the participants were thanked for their participation and informed that they can contact the researcher about any further questions or remarks at any given time.

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Materials

The first material that was used in the study were the three different primers. The deterministic group was presented with a video that induces the idea that free will is an illusion and does not exist (<https://www.youtube.com/watch?v=hmO5uwzFg0M>). This video was accompanied by an excerpt of a speech by Sam Harris, who is a modern philosopher and hard determinist. In this audio, it was stated that free will is an illusion and presuming to have control over our actions, beliefs and thoughts is faulty, which means that we do not have any responsibility for those whatsoever. The indeterministic group was presented with a video that emphasizes the stance that free will exists (<https://www.youtube.com/watch?v=n20bdVAL6vw>). The video was accompanied by an audio that resembled a motivational talk in which it was stated that we have to take control over our actions, take responsibility to change our lives and that our happiness is our own responsibility. Additionally, it postulated the view that every person is the only one in charge for their actions, beliefs, and behaviors. The control group was presented with neutral information that does not have anything to do with the free will debate (<https://www.youtube.com/watch?v=UwVNkfCov1k>), which was an animated video that showed how deep the ocean is. All of these videos are of somewhat equal length, which is around 3.5 minutes, and of equal intensity to ensure that the primers were equally effective.

The second material in this study was the guided meditation spoken by Anneke Sools, which is directly linked to the letter writing exercise (see Appendix D). This meditation started with a short introduction into the methodology of the meditation and the letter writing, which was followed by a body relaxation exercise paired with a body scan. After a short breathing exercise, the subject was asked to imagine travelling to the future with a time machine to a desired destination, which should be imagined as vividly as possible. Finally, the subject was asked to describe the imagined situation within a letter to the present self, which concluded the meditation. The letter that was asked to be written is part of the letters from the future approach developed by Sools and Moren (2012), which is a tool to understand how humans see their future and themselves within it (Sools, Tromp & Mooren, 2015). This letter was asked to be written on a piece of paper to make it feel as personal as possible.

The third and last material that was used consisted of two questions. The participants were asked to rate the freedom they perceived to have whilst writing the letter on a scale of one to ten. Additionally, they were asked to rate their perceived likeliness of the described future to actually occur on a scale of one to ten as well.

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Data Analysis

Steps of Analysis

In order to explore how different attitudes on free will relate to students' imagination of the future, the narrative letters have been used to develop a coding scheme. The first step that was taken was transferring all data from the different conditions into one document, which allowed for blind coding with ATLAS.ti, where the letters were read through to get an overview of the data mostly in terms of content and length. Then, the data was evaluated with a preliminary coding scheme that was derived from the literature concerning free and unfree action and their influence on behavior as presented in the introduction. Whilst reading, additional codes that seemed significant were added. After coding the data twice with the preliminary coding scheme, it was critically analyzed, which led the researcher to merge, delete and keep some codes. Consequently, a coding scheme consisting of 14 codes was established, which was then used to code the data again, this time the researcher had insight into which condition the respective letters belonged to. Then, the frequencies of the different codes were analyzed in a quantitative matter and compared across conditions. Lastly, the questions that were asked in the very last part of the study were analyzed quantitatively. In doing that, the scores per condition were computed and the respective standard deviations were determined. To gain insight into whether the primers had a significant impact, a Oneway ANOVA was performed.

Development of the Coding scheme

Firstly, the letters were coded following the characteristics of free and unfree actions and their impacts on behavior, which were explored in the introduction. This produced a total of 22 codes, which were then used to code the letters. Whilst coding, the researcher engaged in inductive coding through identifying significant concepts and marking them as a respective code. After these processes, the coding scheme consisted of 31 codes, a lot of which did not actually appear in the data. Therefore, most of the deductively produced codes were deleted, with the exception of *Aggressive/Antisocial behavior*, *Continuation of the past*, *Goal orientation*, *Working against external coercion*, and *Taking ownership of one's actions and achievements*, which were kept within the coding scheme because they appeared in the data rather frequently compared to the others. The codes that were derived inductively were

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Valuing family members, Helping behavior, Finding beauty in and connection to nature, Finding meaning in friendships, Finding comfort in a mutual romantic relationship, Transcendence, and Financial independence. These codes were arrived at through reading the letters, identifying striking concepts that were not covered by the current coding scheme, and then adding them to the scheme. During this process, the researcher engaged in constant reflection and revision of the codes to ensure that they were useful enough. Finally, the coding scheme consisted of 14 codes, which were then combined into three main codes. Seven codes, all of which were related to connection to other people or the environment in some sense, were combined to build the main code *Connection*. Another six codes were then combined into *Agency*, and the code *Fulfilment/Happiness* was kept as the third independent main code. The final coding scheme was visualized within a table including the main codes, the respective subordinate codes, their definitions, and a respective example.

It is important to note that the units of analysis were entire sections, sentences, and mere parts of sentences. Additionally, those passages that could not be coded in terms of the developed coding scheme, were coded as *Irrelevant*. Besides that, the data was coded in a way that made it possible for one passage to contain more than one code, and for each code to appear several times within one letter.

Results

The data that was derived from letters from the future aimed at answering the question: *How do different attitudes on free will relate to students' imagination of their future?* Since it was anticipated that there would be a significant difference in the letters from the various conditions, a comparison between those will be made. First, an overview of the different codes will be given, then the difference between the three conditions will be explored further. Afterwards, the differences in perceived freedom whilst writing the letter and perceived likeliness that this future will actually appear will be analyzed.

Identified codes in the letters

In the table (Table 1) below, the codes that were found within the letters are presented.

Table 1

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Coding Scheme: Main codes and subordinate codes with their respective definitions and examples.

Main code	Subordinate code	Definition	Example
Connection	Valuing family members	Feeling a strong connection to and appreciation of family members	<i>I can see my little kids playing with my friends' children, having lots of fun and enjoying themselves.</i>
	Helping behavior	Pursuing voluntary actions that benefit other people and/or one's environment	<i>He was a social entrepreneur, wanting so find solutions for social problems, especially for the poor and disadvantaged people.</i>
	Finding beauty in and connection to nature	Feeling a sense of appreciation for and connection to the aesthetics found in nature	<i>I am standing on top of a green hill, somewhere at the coast of Ireland. I am overlooking the deep blue ocean in front of me. It is a clean ocean, full of life and beautiful nature. The air I</i>

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		<i>breathe is fresh, with a little bit of a salty taste.</i>
Finding meaning in friendships	Valuing platonic interindividual relationships	<i>One of my closest friends is celebrating her birthday and we came together to have a lovely time.</i>
Finding comfort in a mutual romantic relationship	Feeling a strong mutual connection to a significant other in the shape of a romantic relationship	<i>He's perfect for me, because he gives me the feeling that we are a team, no matter what, and his love is unconditional.</i>
Transcendence	Feeling strongly connected to one's environment and the self	<i>All those organisms I see share some kind of connection with me. The perception of connectedness exceeds my visual sense, actually all of my senses. I feel as if I am getting insights about myself through this experience. I fancy about great</i>

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*unifying principles
that cause/enable
the feeling of
connectedness but
then I realize that
my reason is
continued to
rationalizing the
spiritual.*

Working for the
greater good and
personal fulfilment

Having an
occupation that
leads to benefits for
oneself and/or the
society and
environment as a
whole

*He is working on
his own from his
home office and I
found a job as a
project
coordinator. This
allows us to live at
different places in
the world because
we live where I am
running the project.
The projects are
about creating
tolerance in the
society, mostly in
bigger cities where
people live together
from different
cultures. The goal
is to connect these
people and
minimize hate
among each other. I*

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			<i>mostly work with younger people</i>
Agency	Financial independence	Being free of any concerns regarding money and the lack thereof	<i>[...] money luckily does not play a role anymore, since my wage is really good.</i>
	Working against external coercion	An action that, in case of external coercion, goes against precisely those forces	<i>Shortly before it was too late to save the world, you found a group of people who were thinking similar to you and you started fighting for a change in this world. Soon you realized that many people supported the cause and shortly after the great humanitarian revolution began.</i>
	Antisocial/Aggressive behavior	Behaving in a way that harms one's environment and the people within it, both physically and psychologically	<i>I do not want to go into detail but I can tell you that it was brutal and that many people died.</i>

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	Continuation of the past	Pursuing an action that is based on motives, wishes, and general factors from the past	<i>You are still in touch with your college friends and over the last 6 years, you guys have gathered the most incredible memories.</i>
	Goal orientation	Acting in order to attain a specific goal that motivates the action itself	<i>The last years have not always been easy, but you kept working hard and now you are successful with what you do. You were able to do you Master's program in Forensics & Criminal Psychology.</i>
	Taking ownership of one's actions and achievements	Having an increased sense of autonomy and ownership with regards to one's self, one's actions and achievements arising from those	<i>I got to believe in myself, in my skills, in my own capabilities [...]</i>
Fulfilment/Happiness		Feeling a sense of satisfaction and	<i>I am sitting here now as happy and</i>

content relating to
the status quo

*full of love as
possible.*

Exploring Personal Narratives

General characteristics of the letters. All letters were written in a similar structure, which was induced within the guided meditation: They all started with the recipient, which was their own self and ended with a piece of advice to their present self. Some of the letters gave specific insights into when and where their future self is situated whilst writing that letter, whereas others did not give any specific information about time and place. The letters were written on paper and most were about one page long, which was then transcribed into digital documents. The letters varied in length, with the longest consisting of 440 and the shortest consisting of 100 words.

The coding scheme consisted of three main codes with a total of 14 subordinate codes, which appeared 145 times within the letters. Most of those codes appeared in the deterministic condition (38%), followed by the control condition (34%) and the indeterministic condition (28%). In the following, the specific frequencies of the codes across the conditions will be explored and compared further.

Table 2

Codes and their respective frequencies among the three conditions.

Code	Control condition	Deterministic condition	Indeterministic condition	Sum
Connection	29 (20%)	22 (15,2%)	21 (14,5%)	72
Valuing family members	4 (2,8%)	5 (3,5%)	2 (1,3%)	11
Helping behavior	5 (3,4%)	3 (2,1%)	1 (0,7%)	9
Finding beauty in and connection to nature	7 (4,8%)	3 (2,1%)	4 (2,8%)	14

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Finding meaning in friendships	2 (1,3%)	3 (2,1%)	9 (6,2%)	14
Finding comfort in a mutual romantic relationship	5 (3,5%)	3 (2,1%)	3 (2,1%)	11
Transcendence	2 (1,4%)	0	0	2
Working for the greater good and personal fulfillment	4 (2,8%)	5 (3,5%)	2 (1,4%)	11
Agency	12 (8,3%)	26 (18%)	14 (9,7%)	52
Financial independence	2 (1,3%)	3 (2,1%)	0	5
Working against external coercion	3 (2,1%)	0	0	3
Aggressive/Antisocial behavior	1 (0,7%)	0	0	1
Continuation of the past	5 (3,4%)	12 (8,3%)	1 (0,7%)	18
Goal orientation	0	5 (3,5%)	2 (1,4%)	7
Taking ownership of one's actions and achievements	1 (0,7%)	6 (4%)	11 (7,6%)	18
Fulfillment/Happiness	8 (5,5%)	7 (4,8%)	6 (4%)	21
Irrelevant	14	10	12	36
Sum	49 (34%)	55 (38%)	41 (28%)	145

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Connection. The first main code (*Connection*) appeared 72 times within the data across all conditions and consists of seven subordinate codes, which are *Valuing family members*, *Helping behavior*, *Finding beauty in and connection to nature*, *Finding meaning in friendships*, *Finding comfort in a mutual romantic relationship*, *Transcendence* and *Working for the greater good and personal fulfillment*. These codes appeared most frequently within the control condition (29 times), followed by the deterministic condition (22 times) and the indeterministic condition (21 times). In the following, the codes with the highest frequencies will be explored further.

One of the two most important subordinate codes appeared to be *Finding beauty in and connection to nature*, which is defined as feeling a sense of appreciation for and connection to the aesthetics found in nature, and was found a total of 14 times. The majority of quotes that were coded in this way were evident in the control condition, in which it appeared 7 times within statements such as “*the nature everywhere made you fall in love with the world we live in*”. In the indeterministic condition, this code appeared 4 times and was found in quotes like “*I am laying down in the sand in Brazil. The landscape is awesome, there is only nature and me, and I am very relaxed*”. Finally, in the deterministic condition, 3 quotes were found to belong to this code, one of them being “*I am sitting at the beach at the beautiful Gold Coast in Australia*”.

The second subordinate code, which also appeared 14 times across all conditions, was *Finding meaning in friendships*, and relates to valuing platonic interindividual relationships. Interestingly, the majority of quotes coded in this way were found in the indeterministic condition, in which 9 passages were found to emphasize platonic relationships, one of them being “*I value the people around me, they are such interesting human being, which make me laugh and enjoy their life as well*”. Within the deterministic condition, this code proved to be evident a lot less frequently. Here, only 3 quotes were assigned to this particular code, such as the statement “*Also, you are still in touch with your college friends and over the last 6 years, you guys have gathered the most incredible memories*”. There were even less quotes emphasizing meaningful friendships in the control condition, where the code appeared only twice, one of the quotes being “*I am still in contact with some of the people I met there*”. It becomes evident that there are differences in not only the frequency of this particular code across the different conditions, but also in the intensity with which the meaningfulness of friendships is described. Specifically, the passages retrieved from indeterministic condition letters were a lot more emotional and intense than those from the other conditions.

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Additionally, it is evident that none of the quotes specified that they built any new friendships, but rather that they maintained their old ones.

Thirdly, *Valuing family members*, which is defined as feeling a strong connection to and appreciation of family members, appeared 11 times within the data, whilst it is the most evident in the deterministic condition, where it was coded 5 times (e.g. *"I will look ahead to the next day when I take the kids to school"*). In the control condition, the code was found 4 times within statements such as *"It is a sunny Sunday and our grandchildren came to visit us."* Lastly, the code was the least evident in the indeterministic condition with merely two quotes relating to family members, one of them being *"I can see my little kids playing with my friends' children"*. Interestingly, only one statement, which was made in the indeterministic condition, emphasized a connection to the part of their family that they already have, whilst all the other statements concerned families that the participants built themselves.

Another code that was also found 11 times across the data was *Finding comfort in a mutual romantic relationship*, which appeared mostly in the control condition (5 times) within statements, such as *"He is perfect for me, because he gives me the feeling that we are a team, no matter what, and his love is unconditional"*. Further, the code was found 3 times both in the deterministic condition (e.g. *"You are not alone but with your husband who is holding you in his arm"*) and in the indeterministic condition (e.g. *"I have a lovely husband who supports me unconditionally in my goals"*). It is important to note that the majority of statements that were made regarding a romantic relationship were not focused on the significant other, but rather on the person writing the letter themselves. Therefore, the emphasis is less on the other person that the participant is engaged with, and more on the cooperation they have as a couple and on the benefits that the writer of the letter gains from that relationship.

The last code that was significantly important within the main code *Connection* was *Working for the greater good and personal fulfillment*, defined as having an occupation that leads to benefits for oneself and/or the environment as a whole, which appeared 11 times. In the deterministic condition, it was found 5 times within quotes like *"I go here to jail every morning with a smile on my face because I enjoy this work so much"*. The code was found a little less frequently in the control condition, where it appeared 4 times, and least frequently in the indeterministic condition (2 times).

Agency. The second main code that was identified is Agency, which consists of six subordinate codes. These codes are *Financial independence*, *Working against external coercion*, *Aggressive/Antisocial behavior*, *Continuation of the past*, and *Taking ownership of*

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one's actions and achievements. These codes appeared most frequently in the deterministic condition (26 times), followed by the indeterministic condition (14 times) and the control condition (12 times). In the following, the codes that appeared the most frequently will be explored and compared across the conditions.

One of the codes that was the most significant in terms of frequency was *Continuation of the past*, which relates to pursuing an action that is based on motives, wishes, and general factors from the past. It was found 18 times whilst the majority of quotes coded in this way were found in the deterministic condition (12 times) within statements such as "*The hard work and all the effort that I have put into my studies and into my internships has paid off*". Overall, the majority of respective codes within the deterministic condition are focused on some sort of relief that the participant is experiencing. This relief is emphasized in statements regarding overcoming an obstacle and receiving a reward for a struggle from the past. Within the control condition, only 5 passages were coded in this way, one of them being "*The crew is still the same group which you are probably planning a little event with right now*". Interestingly, this code was found only once in the indeterministic condition within the statement "*I don't need any kind of romantic relationship with someone else anymore, which has been a long and confusing journey*".

The second significantly important code was *Taking ownership of one's actions and achievements*, which appeared a total of 18 times in the data. Interestingly, most of the quotes belonging to this code, which added up to a total of 11, were found in the indeterministic condition, one of which was "*I noticed that I have to make myself happy and not rely on other people to do so.*" In the deterministic condition, this code appeared 6 times within statements such as "*In the last 6 years, you built yourself the life you wanted*", whilst it was found merely once in the control condition.

The last code that appeared a significant number of times was *Goal orientation*, which is defined by acting in order to attain a specific goal that motivates the action itself and was found 7 times. Most of the quotes relating to this code were found in the deterministic condition, which added up to 5 quotes, whilst the rest were apparent in the indeterministic condition. Therefore, none of the statements made within the control condition letters were found to relate to this code.

Fulfillment/Happiness. The last main code is one that was not divided into any subordinate codes. It appeared 21 times across the data, the majority of which was to be found in the control condition, where 8 quotes were recognized, such as "*It was a wonderful weekend*". Within the deterministic condition, a total of 7 quotes was coded in this way (e.g.

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“At the moment, I feel so happy”), whilst there were only 6 significant statements relating to fulfillment and/or happiness in the indeterministic condition (e.g. *“I feel calm, light and thankful to be here surrounded by my loved ones”*).

Irrelevant. All of the sequences of the letters that could not be connected to any of the codes above were coded as irrelevant with a total of 36 quotes. The majority of irrelevant statements was found in the control condition, followed by the indeterministic condition and, finally, the deterministic condition. In order to keep the frequencies of the other codes as informative as possible, the irrelevant codes were not included into the computation of those frequencies.

Perceived freedom and likeliness to appear. In order to get further insights into the participants' experiences whilst writing the letters, two questions were asked after they finished writing. The first question was “On a scale of one to ten, how free did you feel whilst writing the letter?” and the second one was “On a scale of one to ten, how likely do you perceive the described future to appear in real life?”. The results are presented in the table below.

Table 3

Means and standard deviations of the scores on perceived freedom and perceived likeliness across the three conditions.

Condition	Perceived freedom	Perceived likeliness to appear
Deterministic	8.2 (SD=1.6)	6.4 (SD=3.1)
Indeterministic	6.6 (SD=0.5)	7.9 (SD=0.9)
Control	8.6 (SD=0.9)	6.8 (SD=3.1)
Sum	7.8 (SD=1.3)	7 (SD=2.5)

The 5 participants in the deterministic condition had an average perceived freedom of 8.2 ($SD = 1.6$) and an average perceived likeliness of their future to occur of 6.4 ($SD = 3.1$); the 5 participants in the indeterministic condition had an average perceived freedom of 6.6 ($SD = 0.5$) and an average perceived likeliness of their future to occur of 7.9 ($SD = 0.9$), and

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the 5 participants in the control condition had an average perceived freedom of 8.6 ($SD = 0.9$) and an average perceived freedom of 8 ($SD = 1.2$). The effect of the videos, therefore, was significant for perceived freedom, $F(2,12) = 4.42$, $p = .036$, whilst the effect of the videos was not significant for perceived likeliness, $F(2,12) = 0.99$, $p = .398$ (see Appendix C).

Conclusions and Discussion

Theoretical Reflection

The aim of this qualitative study was to explore how different attitudes on free will relate to students' imagination of the future. Content-wise, three main themes were found in their imaginations: *Connection*, *Agency*, and *Fulfilment/Happiness* were found. It was evident that there were differences in the importance of those themes across conditions and that, most importantly, the specific nuances of those themes differed significantly depending on belief or disbelief in free will. In the following, this main finding will be explored and evaluated further.

Firstly, there were a number of findings relating to the theme *Connection* within the data. As visible in the tables above, there was no significant difference in the prevalence of this theme between the deterministic and indeterministic condition, which is contrary to research suggesting that deterministic attitudes produce more antisocial behaviour (Baumeister et al., 2009) and research by Baumeister and Brewer (2012) suggesting more sociality in persons with indeterministic attitudes. Still, when considering the subordinate codes, some differences became evident. In the indeterministic condition, meaningful friendships appeared to be the most important kind of connection that the participants emphasized within their letters. This finding is in line with those reported by Baumeister and Brewer (2012), which showed that an increased belief in free will is associated with a higher willingness to be a committed part of society. On the other hand, the present research suggested that helping behaviour is strongly decreased in the indeterministic condition letters. When assuming that helping others is a crucial part of being a functioning citizen and wanting to make an effort to belong to a society, it becomes clear that this finding is contrary to prior research (Baumeister & Brewer, 2012).

A reason for this outcome might be the fact that the video, which functioned as a primer for the indeterministic condition, was highly focussed on autonomy and self-efficacy rather than sociality. Interestingly, participants that were primed with the deterministic video

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mentioned both statements relating to helping behaviour and working for the greater good a lot more frequently than those in the indeterministic condition. This finding is contrary to research done by Baumeister et al. (2009), which show that deterministic attitudes significantly decrease the occurrence of helping behaviour. Lastly, it can be noted that for the control condition, connection to nature was the most prevalent theme within this domain, which might be attributed to the fact that the primer for this condition was a video that showed how deep the ocean is and, thus, dealt with nature itself. Therefore, it would be interesting for future research to utilize a different primer for both the indeterministic and the control condition to see what effect this would have on the data. Specifically, future research could focus on using a less self-focussed primer for the indeterministic condition, whilst using a primer that does not relate to nature for the control condition. This could give further insights into the implications of attitudes on free will on future imagination.

Secondly, there were significant differences in the types of actions that were described within the letters across the different conditions. It was expected that the actions described in the indeterministic letters would be characterized by a high sense of self-efficacy and autonomy, as suggested by Crescioni et al. (2011), which was proven to be true for the current data. Specifically, this observation could be made when considering the frequencies of the code *Taking ownership of one's actions and achievements*, which was significantly increased in the indeterministic condition. Additionally, this finding is supported by the overall principle of libertarianism, which states that people can act freely without being driven by the past (Fischer et al., 2007), which was induced within the priming video. Subsequently, this finding is in line with research suggesting an increased likelihood to act upon one's own volition when believing in the existence of free will (Alquist et al., 2013). Another interesting finding relating to the letters from the indeterministic condition is the fact that goal orientation was decreased in comparison to the deterministic condition. Therefore, the proposal made by Stillman et al. (2011), that a belief in free will is related to high levels of goal attainment, cannot be supported by the results of this study. Fittingly, the most important code relating to *Agency* within the deterministic condition was *Continuation of the past*. Therefore, most of the actions described in those letters were built upon factors from the past, which is in line with the basic principle of determinism suggesting that everything, including human action, is predetermined (McLeod, 2019). Further, it was found that neither antisocial nor aggressive behaviour was mentioned by any participants in the deterministic condition, which is contrary to research findings reported by Feldman and Chandrashekar (2017). This finding might be explained by the fact that, within this study, it was the imagination of the future that was

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analysed rather than those actions that are actually pursued by the participants. Therefore, further research relating to future imagination in this field in particular is needed in order to determine whether there are differences between anticipated action and action itself when inducing different attitudes on free will.

Thirdly, there was no significant difference to be found in fulfilment and happiness across the conditions, which is contrary to other research findings. Results reported by Crescioni et al. (2011) show that belief in free will is associated with both increased life satisfaction and perceiving life to be more meaningful, which is not supported by the study at hand. One reason for this discrepancy might be the fact that the participants in Crescioni's study were not primed in any way in order to induce a certain attitude towards free will, but their attitude on free will was simply assessed and later connected to their test results (Crescioni et al., 2011). Additionally, the instrument that was used in the current study is likely to have a significant impact on the reported happiness and fulfilment within the letters. Since narrative futuring is used as a means to increase positive thinking and feeling (Sools et al., 2015), it seems rather logical that all of the groups describe a more or less positive future, regardless of their priming. Further, the meditation that every participant was subjected to guided them into a rather desirable than undesirable future, which might account for the fact that the differences in happiness and fulfilment are rather small.

Fourthly, some interesting findings were evident relating to the participants' perceived freedom whilst writing the letters and their perceived likeliness of the described future to actually occur. Contrary to expectations, the perceived freedom reported by participants was lowest in the indeterministic condition. This group was expected to report the highest scores on this scale since the priming video strongly emphasized the freedom of every individual. The reason for this finding might be the fact that the motivational talk presented to the participants functioned merely as synthetic inspiration, which is a lot less effective than inspiration arising from one's own motivations (Taylor, 2011). Besides that, the perceived freedom reported by participants in the deterministic group and control group were almost equally high, which was not expected either. The finding that the deterministic video failed to decrease the sense of freedom experienced by the subjects within that condition could be accounted for by the fact that overall, most people feel like they have free will regardless (Baer et al., 2008). Therefore, it might be the case that a simple video is not enough to change someone's attitude on free will and their overall perceived freedom in acting a certain way. On the other hand, the perceived likeliness of the described future to actually occur reported by the participants in the indeterministic condition was a lot higher than those in the other two

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conditions. This finding was expected since it is a logical consequence of the priming video for the indeterministic condition. Additionally, the reported scores of the control and deterministic condition were almost equally low. These findings suggest that attitudes on free will might have had a stronger impact on the confidence with which the participants viewed their future rather than on the actual perceived freedom within the act of prospecting itself. In order to further explore this finding, future research should focus on the exact impact of attitudes on free will on the perceived likelihood of that future to appear.

Lastly, it should be noted that the different aspects of the letters, which were operationalized through the codes, bear a strong resemblance with the two basic motives of human existence introduced by Bakan (1966). Those principles are Communion and Agency, the former encompassing motivations relating to social interaction and connectedness, and the latter relating to various motivational ideas relating to independence. Interestingly, these principles and their respective categories seem almost identical to the main and subordinate codes that were represented within the letters from the future. Especially the categories self-mastery and achievement/responsibility, which are part of the theme Agency relate to both the codes *Goal orientation* and *Taking ownership of one's actions and achievements* (McAdams, Hoffman, Mansfield & Day, 1996). The similarity between the categories of Communion and the subordinate codes of *Connection* in this study are even more remarkable. The category Love/Friendships seems to emphasize the same aspects as the subordinate codes *Finding meaning in friendship* and *Valuing family members* in the same way that the category Dialogue seems to be analogous to what was described in terms of *Finding comfort in a mutual romantic relationship*. Additionally, the category Care/Help can be related to *Helping behaviour* and *Working for the greater good and personal fulfilment* whilst the category Community seems to allude to similar aspects as *Transcendence* and *Finding beauty in and connection to nature*.

The findings of the present study suggest that different attitudes on free will have an impact on the types of behaviors relating Communion and Agency as proposed by McAdams (1996). It appears that people who do not believe in the existence of free will have a stronger focus on *Self-mastery* and *Achievement/Responsibility* in contrast to those who do not believe in free will. Additionally, a belief in free will seems to be related to a focus on *Love/Friendship* whilst a disbelief is more closely linked with *Care/Help*. Interestingly, the themes arising from the control condition can be mapped most closely onto the category *Community*.

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Within the research done by McAdams (1996), agency and communion were found to be central to stories that adults build in order to find both purpose and unity within their lives. Since these findings were related mostly to autobiographical memories, it is interesting to see that the same principles appear in narratives that concern people's imagined future.

Additionally, this study shows that something as fundamental as basic motives of human existence seem to be influenced by different attitudes on free will, which has yet to be explored by further research. This could be achieved by conducting a study exploring letters from the future written by subjects with different attitudes on free will and coding them with the coding scheme proposed by McAdams (1996).

Strengths, Limitations, and Recommendations

The qualitative nature of this research made it possible to explore deeply personal narratives from students and compare the letters of an imagined future with different induced attitudes on free will. This allowed for a comparison of letters that were produced under conditions that did not differ for any of the participants, except for the differences in priming videos across the conditions. Nevertheless, the primer that was used might have been too weak to produce significant attitudes that are then integrated into the letters. This limitation is strengthened by the fact that most people already have an attitude on free will, which is most frequently the belief that they have free will (Baer et al., 2008), and therefore, the priming might have been even less effective. Therefore, future research should focus either on more convincing primers or on utilizing the participants' attitudes on free will which are already existing in order to yield more valid results for the different conditions. This would allow for more precise insights into the implications of attitudes on free will on people's imagination of the future.

Another strength that can be recognized within this study is the effect that it had on the participants. All of the 15 students that took part in the research reported a highly positive feeling after writing their letters from the future characterized by feelings of motivation, hope, and inspiration. An implication of this strength is that it aids the process of recruitment, since the reward for participating lays within the participation itself. Nevertheless, for this particular study, the sample size of 15 students was rather small, which causes the results to be less representative of larger populations and decreases the overall credibility of the results, especially since there were only 5 participants per condition. The fact that only students from the same University, almost all of which were German, participated in the study poses a further threat to the study's generalizability. Therefore, it is recommended to use a larger sample size in future research to increase the results' credibility. Further, a more diverse

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sample, including participant of different origins, socioeconomic background, and age groups, should be used. This would have positive consequences for the overall generalizability of the results.

Final Remark

This qualitative study shed light upon how different attitudes on free will relate to students' imagination of the future and, therefore, sought to explore tangible psychological outcomes of attitudes concerning abstract philosophical themes. This research suggests that people's attitudes on free will do not only influence how confidently they look into the future, but also has an impact of what that future is anticipated to hold for them. The question is how big the scope of those attitudes really is, especially relating to other perspectives on time, such as the past, and what the implications are. This study gave novel insights into how attitudes on the existence of free will relate to how people anticipate their future to unfold and provides a foundation for future research in this field.

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Appendix

Appendix A

Informed Consent

Informed Consent

"How do Attitudes on Free Will Relate to Students' Imagination of the Future?"

Researcher: Stina Nagelmann

To be completed by the participant

I declare in a manner obvious to me, to be informed about the aim, method, and procedure of the study. I know that the data and results of the study will be anonymized and treated confidentially. I am aware that all names, times and places will be removed. Citations may be used in the report, but the data is treated anonymously to the degree that my answers cannot be traced back to me. I know this study takes place in a learning environment and therefore I am aware that the data will be seen by other students and teachers of the University of Twente. My questions have been answered satisfactorily.

I am aware that the study will be recorded. I understand that the audio file thereof will be used only for analysis and scientific presentations.

Taking Part in the Study

Please tick the appropriate boxes

	Yes	No
I have read and understood the study information or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	<input type="radio"/>	<input type="radio"/>
I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	<input type="radio"/>	<input type="radio"/>

Name participant:

.....

Date:

Signature participant:.....

To be completed by the executive researcher

I have given a spoken and written explanation of the study. I will answer remaining questions about the investigation. The participant will not suffer any consequences in case of any early termination of participation in this study.

Name researcher:

.....

Date:

Signature researcher:

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Appendix B

Ethical Approval

APPROVED BMS EC RESEARCH PROJECT REQUEST

Dear researcher,

This is a notification from the BMS Ethics Committee concerning the web application form for the ethical review of research projects.

Requestnr. : 190400
Title : How do attitudes on free will relate to third-year students' imagination of the future?
Date of application : 2019-04-10
Researcher : Nagelmann, S.R.
Supervisor : Sools, A.M.
Commission : Klooster, P.M. ten
Usage of SONA : Y

Your research has been approved by the Ethics Committee.

Appendix C

Oneway ANOVA

Oneway

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Freedom	Between Groups	11,200	2	5,600	4,421	,036
	Within Groups	15,200	12	1,267		
	Total	26,400	14			
Likeliness	Between Groups	8,033	2	4,017	,996	,398
	Within Groups	48,400	12	4,033		
	Total	56,433	14			

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Appendix D

Guided Meditation

Welcome to the Future Now experience.

Thank you for joining us. The Future Now experience is a creative exercise where you will be transported to the future with a time machine. It will take about 20 minutes to write a letter for the future. For this experience to work optimally, we invite you to relax yourself, sit in your chair comfortably and, before starting the exercise, you will receive a guided meditation that will help you travel to the future and relax as much as possible. It is important that you can release your mind, relax a bit, breathe, and don't think too much. Have fun, that's the idea. Are you ready? Let's begin.

So, sit comfortable on your chair with your feet on the ground and take a moment to relax your body. Feel how your feet touch the ground. Maybe wiggle a bit with your toes. And then, move your attention up the legs, up to the belly, and relax. Now, feel how you sit in the chair, how your body touches the seat and take three deep breaths. And with each breath, you release tension that you may have. And you release all thoughts, so you just focus on the here and now, on the breathing. And then smile to yourself, welcome yourself in the present moment. Now, imagine that you are travelling with a time machine to the future. The future can be any moment, it can be a minute from now, a few minutes, tomorrow, days ahead, weeks ahead, months, years. You can go anywhere in the future. You go to a desired situation, a situation where you have accomplished something you desire, where you have learned to deal with some difficulties you may be experiencing now. A situation you like to be in. You look around where you are: Are there people? Is there nature or buildings? What does it look like? What do you look like? What are you wearing? How are you feeling? What are you doing? And now you start describing the situation you are in and you write a letter about this situation. This letter will go back with the time machine to the present, to an audience in the present: It is your present self that you are writing to. So, imagine that you write this letter to your present self. You describe where you are and what you are doing. And also, you describe the path that led you to this desired future. And then you close the letter with a message to the present. When you are ready, you can now open your eyes and start writing.

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