Master Thesis

Emphasizing Future Feelings: The Effect of Anticipated Emotions on Pandemic Decision-Making

Master Thesis
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Abstract

The adherence to pro-societal actions often entails a self-control conflict between different choice alternatives. According to the value-based choice model, individuals evaluate the attractiveness of each choice, by assessing the subjective utility. This process also incorporates the anticipated emotional consequences of our choices, which is known as affective forecasting. In this research I aim to investigate whether affective forecasting can modulate the difficulty of decisions in a pandemic scenario to influence pro-societal and hedonic choice outcomes. 59 (43 females, 16 males) participants of mean age of 22 were divided into an affective forecasting intervention and a control group before encountering a fictitious scenario in which they had to follow either a hedonic or a pro-societal option. The results provided no direct evidence to support the research question, whereas the results of the exploratory analyses yield interesting suggestions to explain the outcomes.

Introduction

Countries around the globe face an immense challenge to reduce the spread of COVID-19. It is essential to understand the ethical decision-making of young individuals in the context of a pandemic to develop effective public health interventions. The adherence to pandemic interventions can involve a self-control conflict between hedonic choices (e.g. meeting new people) and benefit the collective (e.g. reducing social contacts) (Dong et al., 2020; Johnson et al. 2020). These social dilemmas provide us with an opportunity to address the pandemic decision-making of young individuals and test the effectiveness of behavior change interventions that aim to improve adherence to COVID-19 regulations.

Various governments have introduced a wide variety of behavior change recommendations or measures (e.g. physical distancing, personal hygiene, masking, curfews, etc.) to prevent virus transmission. These measures largely show beneficial effects and successfully reduce incidence numbers (Haug et al., 2020). However, studies have reported elevated stress that arises from social isolation in the COVID-19 situation and risks to psychological well-being (Ammar et al. 2020; Passavanti et al., 2021). During this pandemic, people experience changes in everyday life and have to refrain from previous habits (Renzo et al., 2020). This includes withdrawing from social gatherings, restricting the memberships or habits that involve larger social communities, limiting ourselves from cultural events, parties, restaurants, dating, and more, due to the risk of a COVID-19 contagion.

These situations entail a self-control conflict and force individuals to decide, whether or not to act upon conflicting personal goals (Jordan et al., 2020). On the one hand, individuals may strive

for a short-term hedonic goal pursuit like meeting friends, going out, or traveling abroad. On the other hand, individuals may want to meet a long-term societal goal to reduce the incidence numbers of COVID-19 transmissions and follow the government recommendations. People that are torn between conflicting goals, experience these situations as emotionally stressful (Hanselmann & Tanner, 2008). As a consequence, these negative emotions can have several implications for people's adherence to societal health goals. First, negative emotions were related to behavioral inconsistency (Carmon et al., 2003; Roese & Summervile, 2005; Becker et al. 2019) which can cause individuals to change their adherence to ethical decisions after experiencing feelings like regret (Zeelenberg & Pieters, 2007). Second, negative post-choice emotions lead to a loss of trust in government regulations (Min et al., 2020). This is relevant since trust in government regulation is a salient predictor of preventative behaviors (Freimuth et al., 2013). Moreover, lower trust is associated with more government-critical protests (Iacoella et al. 2021). For instance, in Europe, some countries experience an increase in protests for a reduction or even complete abolishment of COVID-19 regulations, symbolizing not merely a challenge for public health, but democracy as well (Guasti, 2020). Roughly 10% of individuals in a pandemic frequently give in to their hedonic goal and show non-compliant behaviors toward COVID-19 regulations (Kleitman et al., 2020). This raises the question, of why people repeatedly reject important healthcare guidelines in the COVID-19 pandemic. One possible reason may originate in a self-control conflict between two opposite goals that people strive to pursue. Hence, it is reasonable to conduct research that aims to supplement scientific evidence about people's intentions in pandemic scenarios and to expand the literature on our understanding of decisional conflicts that arise within pandemic self-control conflicts. This may ultimately support the development of public health measures and improve the adherence to pro-societal goals.

Theoretical models of decision-making have tried to conceptualize self-control conflicts. 2000 years ago, Plato compared drivers of self-control with a pair of horses pulling a chariot. One that is unruly and guided by passion and pleasure and a second, that is rational and rule-bound. In his perception, acting with self-control means steering the chariot in the designated direction. Today, the dual-process model of self-control by Kahneman (2011) can be seen as a contemporary equivalent of the two horses guiding our self-control. The model emphasizes self-control as a leverage to regulate two different cognitive processes. On the one hand, a slow and reflective route that aims to achieve long-term goals and on the other hand, a fast and impulsive route that is guided by short-term temptations. The slow process often collides with short-term impulses which results in a self-control conflict and requires individuals to deliberately resist these temptations to achieve the long-term goal. For instance, a person might want to minimize social contacts in favor of the long-term goal to finish the COVID-19 pandemic, hence, s/he needs to control the immediate

hedonic urge to meet many people. In the recent literature, however, dual-process theories have been criticized for a lack of explanatory complexity and may lead to oversimplification and inaccurate predictions (Evans & Stanovich, 2013). Additionally, research suggested that only some decisions require effortful inhibition of a short-term urge (Fujita, 2011). It was argued that self-controlled actions are, instead, based on tradeoff decisions between a subset of value-based alternatives (Berkman et al., 2016).

The value-based choice model of Berkman and colleagues (2016) is characterized by decisions that accumulate subjective value for a specific option over time. The subjective value integrates costs (e.g. effort, losses) and benefits (e.g. health, social approval). Here, self-control is suggested to highlight the relevant choices and foreground their important attributes. Accordingly, there is neurobiological evidence that accounts for the role of self-control in the process of value-based decision-making. Research by Hutcherson, Bushong and Rangel (2015) showed that self-control outcomes reflect an integration process in the ventromedial prefrontal cortex based on the value of distinct attributes like emotional benefits, gains, and losses (Basten et al., 2010) or the value of altruistic choices (Hutcherson et al., 2015). The value-based choice model gives access to an elaborate picture of processes labeled as self-control conflict in individual decision making, takes choice alternatives into account, and emphasizes self-control to be a gating instance for the selection of options.

When looking at the concept of self-control in more detail, the calculation of subjective value also integrates emotional consequences and predicts our affective states after a certain choice (Gilbert et al. 1998; MacInnis et al., 2017). The anticipation of emotions is called affective forecasting. Patrick et al. (2009) provided evidence, that affective forecasting is highly relevant in the context of self-control and self-regulation. The literature suggests that affective forecasting can, for instance, promote ethically favorable decisions to prevent individuals from negative post-choice emotions (Escadas, Jalali & Farhangmehr, 2019). More specifically, research by Steenhaut and Van Kenhove (2006) showed, that the anticipation of guilt in interpersonal ethical decision-making enhances the ethical behavioral intention. Furthermroe, Karl, Kock, Ritchie and Gauss (2021) argued, that affective forecasting can stimulate respondents' episodic future thinking to increase the subjective value of a choice like adherence to personal goals. However, the impact of emotions on our behaviors has been studied extensively in contrast to the question of *how* emotions exert an influence on our behaviors. Despite being argued to have a strong impact on self-control (MacInnis & Patrick, 2006), research on emotions in the self-control domain remains scarce (Baumeister et al., 2007, 2008). Ethical dilemmas in the current COVID-19 pandemic introduce a new possibility to study affective forecasting in decision making from the perspective of self-control. Nevertheless, the role of self-control in pandemic decision-making is generally understudied and to my

knowledge, no study investigates the impact of affective forecasting on self-control conflicts in the context of pandemic decision making.

The effects of affective forecasting on decision-making were investigated recently, to influence travel choices in a pandemic context from a consumer-marketing perspective (Karl, Kock, Ritchie & Gauss, 2021). However, it is not clear, whether these findings translate to ethical decision-making in the situation in which individuals are confronted to act in line with either hedonic or pro-societal goals due to COVID-19 regulations from the perspective of the value-based choice model. In this research, I investigate the question of whether affective forecasting can modulate the difficulty of a decision in a pandemic scenario to influence pro-societal and hedonic choice outcomes. Based on the theoretical framework I hypothesize that:

Hypothesis 1 (H1). The affective forecasting intervention will lead to more pro-social choices in the intervention condition compared to the control condition.

Hypothesis 2 (H2). The difficulty of the decision in the affective forecasting condition will be lower in contrast to a control group.

This is plausible because the anticipation of emotions is an integral aspect of self-control processes (MaxInnis & Patrick, 2006). Self-control was argued to be of importance for the selection of the subjective utility in value-based choices (Berkman et al., 2016) because affective forecasting will promote people's attention to the long-term negative consequences of hedonic goals pursuit. This aspect then becomes integrated into the subjective value of the long-term choice over its conflicting hedonic short-term choice. Therefore, the anticipation of emotions may influence the decision-making of young individuals that are torn between two opposing options, namely, hedonic choices and pro-societal choices. In other words, emphasizing the emotional consequences might increase the subjective utility of the pro-societal choice and, therefore boosts the selection of that choice over its conflicting alternative option. Thus, the difficulty of a decision reduces, since the contradicting choices are more distant in their attractiveness (Liberman and Förster, 2006) and the value of the long-term pro-social choice is higher than the short-term hedonic choice.

To investigate these hypotheses, I employ an affective forecasting intervention, that was shown to be effective in the research of travel decision-making during the COVID-19 pandemic (Karl, Kock, Ritchie & Gauss, 2021). The researchers used an affective forecasting intervention to mentally stimulate participants' predictions of how they would feel in future holiday experiences. Their results showed that affective forecasting can mitigate risk perceptions and can modulate travel behaviors. I aim to use this intervention to modulate risk perceptions in a fictitious social situation regarding COVID-19 and to stimulate pandemic behavior intentions that are in line with public health measures. Therefore, the intervention will be administered before a COVID-19 relevant

scenario in which the participants will encounter a dilemma scenario that arises from the restrictions of COVID-19 regulations. Participants will be forced to decide between a selfish choice option and a pro-societal choice option as a proxy for the trade-off decisions that have to be made when facing COVID-19 measures in everyday life. Based on the response in the scenario, participants will be asked to indicate their actual emotional responses (i.e. guilt, regret, pride), as well as how difficult they experienced the dilemma and how satisfied they are with their choice. With this research, I seek to complement evidence that helps to understand the role of emotions (i.e. the anticipation of emotions) for value-based choices (i.e. ethical decisions). It was argued, that self-control is an integration process that can be influenced by salient contributors to a specific choice, such as the emotional outcome. Understanding the role of affective forecasting in this context can help to improve the conceptualization of behavior change interventions that, for instance, aim to reduce the progression of global pandemics. To create a scenario that provides the main study with a situation that is authentic, balanced, and difficult to answer, I conducted a pilot study. The pilot study investigated the decision difficulty of three different scenarios that varied in their context regarding pandemic situations. One scenario was chosen for the main study.

Method

Pilot Study (Study 1)

Design

To study the difficulty of three different scenarios and to make possible adaptions, a within-subject design was created using the three different scenarios as within-subject factors and a brief decision difficulty questionnaire to assess the decisional conflict that arises from answering the scenario as the dependent variable.

Participants

For the recruitment of the pilot study, convenient sampling among the social circle was used and an invitation to the online study was sent to individuals who want to participate. In total 28 participants took part in the pilot study. After controlling for survey completion, 8 participants had to be removed from further data analysis, leaving 20 participants with a mean age of 28 (M = 28.05; SD = 9.82; range: 18 - 65).

Procedure and Materials

After giving informed consent to participate in the pilot study, participants were presented with each of the three scenarios in random order. The three scenarios (scenario 1 "Lake", scenario 2

"Supermarket" and scenario 3 "Party", see Appendix A) were invented before the pilot study for this study. Hence, each scenario contained a different dilemma situation, based on everyday experiences during the COVID-19 pandemic to create an authentic fictional situation as a proxy for a real pandemic situation. After each scenario, the participants had to answer with yes or no to either act in line with hedonic or a societal intention to refuse to/ follow COVID-19 regulations. Next, a brief questionnaire about the difficulty of the decision in the given scenario. Lastly, a substantiation block followed, in which the participant could explain why a certain scenario was easy to answer and give annotations.

Measurements

After being presented with the scenario, participants had to choose between two options and answer yes or no. A 'yes' corresponded with an adherence to the regulations, whereas a 'no' response was a violation of the given regulations in the scenario. Next, the difficulty of the decision was measured, using three questions with a slider (range 1 - 7) of which one item was reversed. First, "How difficult did you find this choice?" (1: *very easy* – 7: *very difficult*). Second, "How confident are you about your choice?" (reversed; 1: *not very confident* – 7: *very confident*) and third, "While making the choice I experienced conflict? " (1: *not at all* – 7: *very much so*).

Results

The results showed that the first scenario ("Lake") had the most average decision difficulty among the three (see Table 1). Furthermore, the balance between yes and no responses were almost even in the first scenario "Lake" (hedonic: N = 11, 55%; pro-societal: N = 9, 45%). Furthermore, there was little difference in how difficult the scenario was perceived by participants who chose the hedonic option compared to participants who chose the pro-social option. Thus, based on this small sample in the pilot study, the first scenario "Lake" showed to be the best suitable for creating a dilemma situation to study the intervention in the main study, because for three reasons. First, the intervention in the main study aimed to reduce the decision difficulty, and the 'Lake' scenario had on average the highest decision difficulty, especially for the pro-societal choice. Second, the decision difficulty between the hedonic and pro-societal options was most balanced. And third, the number of choices was almost equally distributed between both choice options. A balance of decision difficulty and choice distribution was intended, to reduce the chance of an overly emphasis on one of the choices and possibly investigate the data with further exploratory analyses.

Table 1

Descriptives of number of choices (n), mean (M) and standard deviation (SD) of decision difficulty of the three scenarios.

	Hedonic Choice			Pro-societal Choice			Total		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Scenario 1 “Lake”	11	3,39	1,43	9	3,52	1,47	20	3,45	1,41
Scenario 2 “Supermarket	8	3,71	1,75	12	2,72	1,5	20	3,12	1,63
Scenario 3 “Party”	15	3,42	1,39	5	2,73	1,19	20	3,25	1,35

Main Study (Study 2)

Participants

An a priori power analysis using G*power 3.1 for an one-directional t-test (means, differences between two independent means) with a medium effect size of $d = .5$, an α error probability of .05 and a power of .8, revealed a required sample size of $N = 102$. The recruitment of participants took place via the student sampling platform SONA at the Radboud University ($N = 67$), additionally, convenient sampling was used to expand the acquisition of participants ($N = 10$). No incentives were given and participation was on a voluntary basis. Individuals who participated in the study had to be of a minimum age of 18 and a maximum of 35 and proficiency in the English language. Other exclusion criteria were a) incomplete survey responses, b) insufficient English proficiency, c) full vaccination and d) having a positive COVID-19 history. Initially, 77 participated in the survey, after controlling for incomplete survey responses ($N = 8$), the status of full vaccination ($N = 5$) and positive COVID-19 history ($N = 5$) the final sample consisted of 59 subjects with mean age of 22 ($M = 21.97$; $SD = 3.54$; range: 18 - 35), leaving 28 participants in the intervention group and 31 in the control group. Out of the final sample, 16 participants identified as male and 43 as female.

Materials

Affective forecasting intervention. The intervention was aimed to motivate participants to consider the emotional consequences of both choices. Participants were presented with each of the 7 questions in a randomized order: 1. "If my behavior causes me to become infected with COVID-19, I would feel guilty.", 2. "If I were infected due to irresponsible behaviors of mine, I would regret it.", 3. "*If my behaviors actively prevented the spread of the COVID-19 virus, I would feel proud.*",

4. "*If I was responsible for the COVID-19 infection of another person, I would regret it.*", 5. "*If my actions caused a COVID-19 infection for another person, I would feel guilty.*", 6. "*If my actions caused a COVID-19 infection for another person, this would impact my life.*". Each question had to be answered on a 5-point Likert scale ranging from 1 "*not at all*", 2 "*a little*", 3 "*moderately*", 4 "*much*" to 5 "*very much so*".

Pandemic scenario choice. Based on the pilot study, the first scenario was chosen with the highest overall decisional conflict ($M = 3.45$ $SD = 1.41$) and most even responses between the hedonic (55%) and societal choices (45%) to reduce the chance of an overly emphasis for one of the choices. According to the feedback of the participants in the pilot study, some minor adjustments to the overall appearance and wording were done, to control for misunderstandings. After reading the scenario, all participants were asked "Do you join the trip to the lake?". The answer options were yes or no, where 'Yes' would include a violation of the given COVID-19 regulations in the favor of a hedonic goal and 'No' a pro-societal response in line with the COVID-19 regulations, to not risk a virus transmission.

Decision Difficulty. Immediately after their response to the scenario, all participants answered three questions in a randomized order about the difficulty of their decision. The questions had been derived from a study by Becker (2020) about ethical choice conflict in consumer marketing decisions, showing Cronbach's α of .85 and .81 in this research. The first question "*How difficult did you find this choice?*" had to be answered on a scale from 1 (*very easy*) to 7 (*very difficult*). Second, "*While making the choice I experienced conflict*" on a scale from 1 (*not at all*) to 7 (*very much so*), and third, "*How confident are you about your choice*?", 1 (*not very confident*) to 7 (*very confident*), was included as a reversed item.

Exploratory Measures. To explore the dataset, I included questions about the post-choice emotions of participants. The emotional responses were measured on four different scales that were used in previous research by Becker (2020). The total number of 9 questions were presented in a randomized order and had to be answered on a 7-point Likert scale ranging from 1 (*not at all*) to 7 (*very much so*). First, guilt was measured using three questions "*When I think back to my choice, I feel guilty/ I feel bad/ I get a bad conscious.*" with a internal scale consistency of Cronbach's $\alpha = .88$. Second, regret was measured with three items: "*When I think back to my choice I feel regret.*", "*When I think back to my choice, I wish I had chosen the other option.*" and "*When I think back to my choice, I would change it if I had the chance.*" (Cronbach's $\alpha = .85$). Third, pride was measured using one question: "*When I think back to my choice, I feel proud.*" and fourth, choice satisfaction

with two questions: "*When I think back to my choice, I feel good.*" and "*When I think back to my choice, I am satisfied.*" showing an internal reliability of Cronbach's $\alpha = .81$.

Procedure

After recruitment and signing up for the survey, all participants were informed about the content of the study and had to consent to proceed. After giving consent, participants were asked to answer demographical questions about age, gender, relationship status, English proficiency, level of education, vaccination, previous history of COVID-19 infections and the level to which they were afraid of acquiring the virus. Next, each participant was randomly assigned to either the control or intervention group. The intervention group received the affective forecasting questionnaire, whereas the control group directly proceeded to the pandemic scenario. Prior to the scenario, all participants were asked to sit at a quiet and comfortable place without distraction to imagine the scenario as vivid as possible. Subsequently, participants read the scenario (152 words) before they had to decide between two answer options (hedonic/ pro-societal) between a hedonic and a societal choice. After indicating the answer, each participant encountered three questions about the difficulty of the decision. Next, a block of exploratory analyses followed, containing a set of randomized questions about emotional consequences (guilt, regret, pride, and choice satisfaction).

Data Analysis

The data was structured and analyzed using IBM SPSS Statistics 25 (IBM Corp., 2017). To investigate the research question of whether affective forecasting modulates the difficulty of a decision in a pandemic scenario to change pro-societal and hedonic choice outcomes, I test two hypotheses. A between-subject factor was included with an intervention group ($N = 28$) and a control group ($N = 31$). To test the first hypothesis **(H1)** whether affective forecasting can increase pro-societal choices, I conducted a Chi-square test using *group* (intervention/ control) as between-subject factor and the frequency of responses (binary, hedonic/ pro-societal) as the dependent variable. To test the second hypothesis **(H2)** whether affective forecasting can reduce the decision difficulty of a pandemic dilemma, I conducted a t-test with *group* (intervention/ control) as between-subject factor and decision difficulty (continuous, range: 1 – 7) as the dependent variable. Decision Difficulty was calculated as the mean of the three subquestions.

Results

The effect of affective forecasting on the choice outcomes. According to the first hypothesis, a Chi-square test was conducted. In the intervention group more individuals chose the pro-societal choice over the hedonic choice (see Figure 1). 61% responded with 'yes' compared to 42% in the

control group. However, this difference was not significant ($\chi 2 = 1.392$, $df = 1$, $p = .238$).

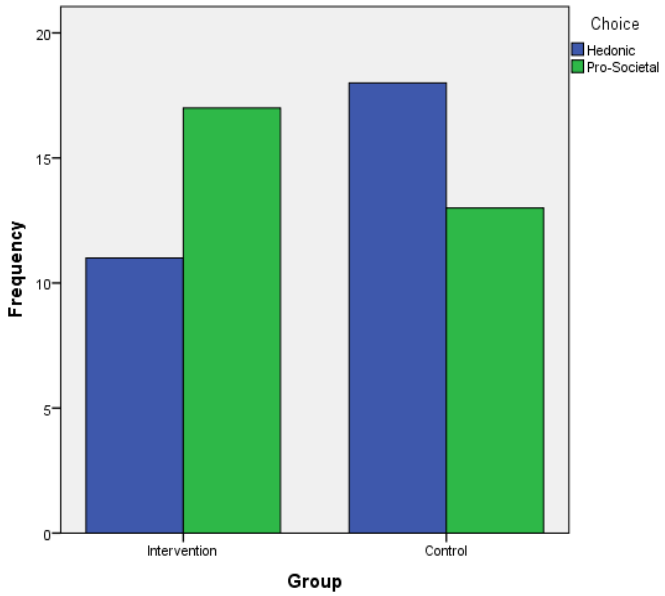

Figure 1. *Frequency of the choice options per condition.*

The effect of affective forecasting on the decision difficulty. To test the second hypothesis, I conducted a t-test for independent samples. The 28 participants who received the intervention (M = 4.07, SD = 1.67) compared to the 31 participants in the control condition (M = 3.90, SD = 1.34) reported no significant difference of decision difficulty $t(57) = .428$, $p = .67$.

Table 2. *Descriptive statistics for decision difficulty across each choice.*

Group	Choice	Mean	Std Deviation	N
Intervention	Hedonic	5.03	1.44	11
	Pro-societal	3.45	1.54	17
	Total	4.07	1.67	28
Control	Hedonic	3.70	1.44	18
	Pro-societal	4.18	1.20	13
	Total	3.90	1.34	31

Additional Analyses

The effect of the intervention on the difficulty of the decision per choice. Since the intervention aimed to increase the awareness about negative emotions when violating the regulations and positive emotions when adhering to the regulations, it may be the case that the intervention influences the subjective value of the pro-societal option, but not enough to reach the required threshold to exceed the hedonic value. In this case, the required threshold to shift the decision to a pro-societal choice was not reached and the hedonic choice only becomes more difficult. For instance, anticipating negative emotional consequences when violating COVID-19 regulations may enhance the subjective value of adhering to the regulations. As a result, it reduces the decision difficulty of the pro-societal choice. However, it may also increase the decision difficulty for individuals that respond with a selfish option, since their decision became more costly in the long run when taking this additional aspect into account. Nevertheless, this aspect was not enough to convince them to follow a pro-societal choice. To explore the data according to this logic, I conducted a two-way ANOVA using the choice options and group as between subject factors and decision difficulty as dependent variable. Indeed, the results revealed a significant interaction effect of group*choice (F (1,55) = 7.41, p = .01, $\eta 2$ = .12) on the dependent variable. Simple main effect analyses on the effect of group on the decision difficulty showed no significant effect for pro-social choosers (t (28) = -1.408, p = .17) but a significant effect for hedonic choosers (t (27) = 2.41, p = .023). Hence, the decision difficulty for the pro-societal choice in the intervention group was not significantly lower (M = 3.45, SD = 1.54) compared to the control group (M = 4.18, SD = 1.20), however, the decision difficulty for the hedonic choice was significantly higher in the intervention group (M = 5.04, SD = 1.44) compared to the control group (M = 3.70, SD = 1.44). These results suggest, that for individuals in the intervention condition the pro-social choice became slightly easier, whereas the hedonic choice became more difficult compared to the control group (see Table 2). Furthermore, the interaction effect was more dominantly caused by differences in perceived difficulty for hedonic choosers than pro-societal choosers. This suggests that individuals that decided selfishly, may struggle more with their decision because they anticipated more negative and less positive post-choice emotions. Conversely, participants that decided in a pro-societal way, may do this with more ease, due to less negative and more positive anticipated post-choice emotions.

The effect of the intervention on emotional responses. To investigate, whether the choices were related to different emotional outcomes for the different conditions, I explored the data with a two-way ANOVA with group and choice option as between subject factor and each investigated emotion (guilt, regret, pride and choice satisfaction) as dependent variable. A two-way ANOVA for *guilt* revealed no significant interaction between group (control/ intervention) and choice (hedonic/ pro-

societal) (F (1,55) = 1.64, p = .206, $\eta 2$ = .029). Simple main effect analyses showed no significant effect of group (F (1,55) = 0.11, p = .745, $\eta 2$ = .002.) but a significant effect of choice (F (1,55) = 18.60 , $p < .001$, $\eta 2$ = .253.) on guilt. Thus, individuals that chose the hedonic option experienced more guilt compared to the pro-societal choosers. Second, a two-way ANOVA for *regret* revealed no significant interaction between group*choice (F (1,55) = 1.35, p = .251, $\eta 2$ = .024). Simple main effect analyses showed no significant effect of group (F (1,55) = .14, p = .712 , $\eta 2$ = .002.) and no significant effect of choice (F (1,55) = 3.76, p = .058, $\eta 2$ = .064) on regret. Furthermore, I conducted a two-way ANOVA for *pride,* that revealed no significant interaction between group*choice (F (1,55) = 3.65, p = .061, $\eta 2$ = .062). Simple main effect analyses showed no significant effect of group (F (1,55) = .19, p = .666, $\eta 2$ = .003) but a significant effect of choice (F (1,55) = 48.50, $p < .001$, $\eta 2$ = .469) on pride. Pro-societal choosers felt more proud about their choice compared to hedonic choosers. A two-way ANOVA for *choice satisfaction* revealed a significant interaction between group*choice (F (1,55) = 12.75, p = .001, $\eta 2$ = .188). Simple main effect analyses showed no significant effect of group (F (1,55) = 2.46, p = .122, $\eta 2$ = .043) but a significant effect of choice (F (1,55) = 7.67 , p = .008, $\eta 2$ = .122.) on choice satisfaction. Hence, participants that made an pro-societal choice were on average more satisfied with their decision then participants that chose the hedonic option. However, individuals that chose the pro-societal option were more satisfied in the intervention group compared to the control group, whereas individuals that chose the hedonic option were less satisfied with their choice in the intervention group compared to the control group.

Table 1. *Descriptive Statistics for positive and negative emotions after the choice per condition and separated for those who chose hedonically and those who chose pro-societal.*

Group	Emotions	Mean	Std Deviation	N
Hedonic Choice				
Intervention	Guilt	3.15	1.55	11
	Regret	2.24	.99	11
	Pride	1.64	.92	11
	Satisfaction	3.09	1.66	11
Control	Guilt	2.85	1.38	18
	Regret	2.06	1.04	18

	Pride	2.56	1.42	18
	Satisfaction	4.81	1.23	18
Pro-societal Choice				
Intervention	Guilt	1.39	.66	17
	Regret	1.51	.64	17
	Pride	5.12	1.62	17
	Satisfaction	5.21	1.19	17
Control	Guilt	1.90	1.07	13
	Regret	1.87	.87	13
	Pride	4.54	1.71	13
	Satisfaction	4.54	.97	13

Discussion

This study aimed to investigate whether affective forecasting can modulate the difficulty of a decision in a pandemic scenario to influence pro-societal and hedonic choice outcomes. It was hypothesized, that the affective forecasting intervention can lead to more pro-social choices in the intervention condition compared to the control condition (H1) and that affective forecasting would reduce the decision difficulty of the fictitious scenario in the intervention group compared to a control group (H2). The pattern of the results found no significant evidence to support either the first or the second hypothesis. However, the descriptive and further exploratory analyses may give more insight into the underlying reasons for these findings.

Regarding the first hypothesis, there was no significant evidence that affective forecasting increases the number of pro-societal choices compared to the hedonic choices. Despite the small sample size, the results seem surprising given the recent findings by Karl, Kock, Ritchie and Gauss (2021), that affective forecasting can modulate behaviors in travel decision making, as well as Steenhaut and Van Kenhove (2006) who suggested that the anticipation of guilt enhances the ethical decision and research by Escadas, Jalali, and Farhangmehr (2019) who proposed that affective forecasting can promote ethical behaviors to prevent negative emotions. According to the value-based choice model proposed by Berkman and colleagues (2016), it was argued that the intervention may promote the anticipated post-choice emotional advantage of the long-term choice (pro-societal). Since our anticipated emotions are integrated within the subjective value of a choice

option, this positive aspect should increase the value of the pro-societal choice which would lead to more pro-societal choices in the intervention condition. Apparently, the anticipated emotions in the intervention showed a lower influence on the choice outcomes than expected. This may be due to several reasons. First, the study was underpowered and did not reach the required sample. Second, the impact of the intervention could possibly be improved by extending the imagery load in which participants forecast their emotional outcomes. For instance, participants may be asked to substantiate how they would feel and describe their imagined effective outcome. Finally, the intervention used multiple emotions, including guilt, regret, and pride. It may be the case, that using more, different, or fewer emotions would provide a larger anticipatory effect on the decision-making.

Considering the second hypothesis about the influence of affective forecasting on the decision difficulty, it was hypothesized that the intervention would reduce the decision difficulty. Further, it was argued, that promoting the pro-societal choice option would lead to a lower decision difficulty because it increases the subjective value that is given to one option (in this case the pro-societal choice) in contrast to its conflicting alternative (the hedonic choice). Hence, the decision becomes easier because the choices are less contradicting and the pro-societal option is easier to retrieve. However, the results of this study show no difference between the groups. The intervention did not change the perceived difficulty of the choice in the pandemic scenario. It is conceivable, that different aspects influenced this result. For example, the decision difficulty may be *lower* for the pro-societal choice in the intervention group compared to the control group, whereas the decision difficulty of the hedonic choice is *higher* in the intervention group compared to the control group. Thus, the mean decision difficulty across both choice outcomes in the intervention group remains relatively equal in contrast to the control group, whereas the difference in the decision difficulty between the choice outcomes in the intervention group *increases* compared to the control group. Accordingly, the exploratory results of the study have shown that the reported difficulty of the decision differed across groups and choice outcomes. More specifically, the exploratory analysis of the influence of group and choice outcome on decision difficulty showed, that participants in the intervention group reported a lower decision difficulty when they made a pro-societal choice and a significantly higher decision difficulty when they made a hedonic choice compared to the control group. Even though these results were only correlational and should be interpreted with caution, it seems plausible, because affective forecasting may influence the subjective value, but not enough to reach the threshold for pro-societal choice. In this case, the required tipping point to shift the decision from a selfish intention to a pro-societal choice would not be reached and the hedonic choice only becomes more difficult, since the decision-maker quarrels with the consequences. If the intervention would have been more successful, more people would have chosen the pro-social

choice and thus, an overall effect on decision difficulty may be detected under that condition.

Further exploratory analyses that investigated whether participants felt different after both choice options between the groups revealed no interactions between condition and type of choice on the measured emotions (guilt, regret, pride, and choice satisfaction). From this can be concluded, that the intervention does not seem to impact either negative (guilt and regret) or positive emotions (pride and choice satisfaction) after a fictitious pandemic decision. Nonetheless, the descriptives indicate a subtle tendency in the intervention condition towards a boost of positive and a decline of negative emotions for the pro-societal choice and a reduction of positive and a boost of negative emotions in the selfish choice. But future research with a larger sample and more power is needed to investigate, whether this small descriptive difference is reliable.

Whereas there was no difference in experienced emotions between the affective forecasting intervention and the control condition, there was a significant difference in emotions as a function of what people chose. Individuals choosing the hedonic option reported higher guilt and individuals choosing the pro-societal choice reported higher pride and choice satisfaction. Since this difference was correlational, there are alternative explanations. Individuals may have chosen an option because of their feelings. For instance, people with higher feelings of guilt may be more inclined to choose a hedonic option to improve their current mood. On the one hand, these results seem in line with the literature about differences in negative emotional responses to hedonic choices (Antonides & Cramer, 2013) and positive emotional responses when acting ethically (Escadas, Jalali & Farhangmehr, 2019). On the other hand, it would be reasonable to expect a stronger difference in emotional responses given the results of the exploratory analysis, indicating a difference in the decision difficulty per choice between the groups. According to Becker (2020), the difficulty of a decision is a determinant of the emotional consequences of a decision, thus, it seems plausible that a reduction of the difficulty of a choice with an affective forecasting intervention can lead to better emotional outcomes. However, this study was underpowered and there might be other reasons for these findings. First, one of the most plausible alternative explanations arises from the phenomenon, that individuals systematically overestimate the emotional impact of future events. In the literature, this is defined as so-called *impact bias* (Wilson & Gilbert, 2005). Participants may overestimate their emotional response before the decision, however, after the decision, this effect may simply be not as strong as expected and therefore participants report lower changes in emotional response than initially expected. Another alternative explanation may be the theoretical nature of the scenario. Since there was no real threat of infection, there is probably also only a flattened emotional response to the risks that are displayed in the scenario.

There are several limitations to this study. First, the study was generally underpowered with roughly half of the participants that would have been required. This was due to a short period of

data collection and certain selection criteria that were predefined. For example, the number of vaccinated people and infections aggravated the collection of participants. Despite that, the study was conducted online in a low immersive environment where possible distraction cannot be controlled for. Another limitation was the theoretical scenario that merely measured behavioral intentions, but not real-world behaviors. It follows, that the effect of other variables in the study (i.e. emotional consequences) might have been milder representations compared to real-world situations. Furthermore, decision difficulty was measured after the choice and not during the choice. The setup could have been improved by asking participants about their evaluation of decision difficulty between showing the scenario and giving them the possibility to respond. This may yield more precise results. Finally, the sample consisted mainly of students of which the majority identified as women (73 %), thus, the generalizability may be compromised. However, the results of this study are relevant for research in the domain of affective forecasting and its influence on decision making for two reasons: A) it provides an additional approach to utilize 'decision difficulty' as a marker for the subjective value of anticipated emotions within decision making and B) it gives a glimpse into possible ways to investigate the influence of anticipated emotions on decision making in a pandemic context. More importantly, I discussed questions that may be interesting for future research. First, the intervention predominantly used the anticipation of negative affective consequences. It is questionable whether the anticipation of other positive emotions (for instance choice satisfaction) can yield similar results. Despite that, it is of interest to test the possible effectiveness of later findings in this field in a real-world public health intervention to overcome a behavior-intention gap. Lastly, research about the influence of affective forecasting on decision making would benefit from investigating the longevity of such effects and their impact on the continuity of behaviors to shield them from behavioral switching.

To conclude, influencing the attractiveness of choice options with affective forecasting remains an interesting attempt to boost the desired choice outcome. This research adds to the understanding of the role of affective forecasting within the process of decision making in a pandemic context, because it provides one of the few studies an approach to use affective forecasting as an intervention to influence health-related intentions in times of COVID-19. Moreover, this study points to the possibility that the impact of affective forecasting interventions may partly depend on the subjective value of each choice option instead of a general conflict that arises from restraints in a pandemic scenario.

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Appendix A) Scenarios of the prestudy

Scenario 1 “Lake”

Scenario 2:
COVID-19 Regulations

→ Border restrictions (valid PCR test required, 14 days quarantine).

→ Individual movement restrictions.

(You are not vaccinated yet.)

“You are coming back from a city trip to another country nearby (e.g. Spain, Italy, France,...). The trip was amazing, but unfortunately, the city turned into a high-risk area with rising incidence in the meanwhile. After passing the border control with a negative PCR test you finally arrive back home. According to the guidelines, you should quarantine for 14 days. After 8 days, you feel lonely. You have no symptoms and the test was negative anyways. Luckily, two very good friends are calling you. They know your situation and want to invite you for a trip to the lake for a couple of hours. It would be just the three of you.”

Do you join the trip to the beautiful lake?

Scenario 2: ”Supermarket”

Scenario 1:
COVID-19 Regulations:

→ Wear an FFP-2 mask inside.
→ Keep a 1,5 m distance.
(You are not vaccinated.)

“You are on the way to the supermarket to quickly grab a missing ingredient for the birthday cake of a friend. It is cold and you have to wait in line for the supermarket because it is very crowded. Just when it is your turn, you realize, you forgot your FFP-2 mask. You still have your scarf, which is no protection, but you could hurry and go through the supermarket without anyone saying something in just a few minutes.”

Do you rush through the supermarket for the last remaining ingredient?

Scenario 3: “Party”

COVID-19 Regulations

→ Curfew outside after 9 pm

→ Small gatherings are prohibited (Only 4 people in one household are allowed)
(you are not vaccinated and quick tests are not available)

"You just had exams and you want to meet friends, but it is just before the curfew 8:30 pm. The friends live very close on the other side of the street (only 100m). You know that there will be 5-7 people including you, which are more than allowed. Nevertheless, you see each of them individually anyways once a week."

Do you go to your friends?

Appendix B) Scenario of the main study.

COVID-19 Regulations:

→ Border restrictions (valid PCR test required).

→ Individual movement restrictions (10 days quarantine upon returning home).

(You are not vaccinated yet and there are no quick tests.)

"You are coming back from a city trip to another country nearby (e.g. Spain, Italy, France,...). The trip was amazing, but unfortunately, the city turned into a high-risk area with rising incidence in the meanwhile. After passing the border control with a negative PCR test you finally arrive back home.

According to the guidelines, you should quarantine for 10 days. After 4 days, you feel lonely. You have no symptoms and the test was negative anyways.

Luckily, two very good friends are calling you. They know your situation and want to invite you for a trip to a local lake for a couple of hours. It would be just the three of you, however, the lake is known to be crowded."