You will receive your money next week! Experimental evidence on the role of Future-Time Reference for intertemporal decision-making

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ABSTRACT

Against the background of the increasingly discussed "Linguistic Saving Hypothesis" (Chen, 2013), I studied whether the targeted use of a present tense (close tense) and a future tense (distant tense) *within* the same language have an impact on intertemporal decision-making. In a monetarily incentivized laboratory experiment in Germany, I implemented two different treatments on intertemporal choices. The treatments differed in the tense in which I referred to future rewards. My results show that individuals prefer to a greater extent rewards which are associated with a present tense (close tense). This result is in line with my prediction and the first empirical support for the Linguistic Saving Hypothesis *within* one language. However, this result holds exclusively for males. Females seem to be unaffected by the linguistic manipulation. I discuss my findings in the context of "gender-as-culture" as well as their potential policy-implications.

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1 Introduction

According to the increasingly discussed Linguistic Saving Hypothesis (LSH)[1], for individuals who have the opportunity to talk about the future in a present tense (close tense) the future seems to be temporally closer since they can associate present and future linguistically. As a consequence, they display a more future-oriented behavior compared to individuals who have to refer to the future by using a future tense (distant tense) (Chen, 2013).

There is growing support for the LSH in the literature (e.g. Pérez and Tavits, 2017; Mavisakalyan et al., 2018; Sutter et al., 2018; Herz et al., 2020; Kim et al., 2021). However, all of these studies have in common that they compared the behavior of individuals who speak different languages, for instance, Chinese (enables to use a close tense in prediction-based contexts) and English (forces to use a distant tense in prediction-based contexts). This raises the question whether rather cultural issues instead of linguistic differences drive the results (Roberts et al., 2015).

In this study, I change the research focus on the LSH and examine whether the targeted use of close tense and distant tense *within* the same language affect intertemporal decision-making. In this context, I take advantage of the grammatical particularities of the German language which enables their speakers to talk either in a close *or* in a distant tense in prediction-based contexts. This procedure provides the opportunity to isolate cultural motives. Using a between-subject design, I implement an incentivized economic experiment with two treatments. Both treatments contain the same choices between two rewards which are available at different dates in the future. The treatments differ in the framing of the payment dates. In the treatment CLOSE the earlier reward is associated with a statement in a close and the later reward is associated with a statement in a distant tense. In the treatment DISTANT a statement in a distant tense is linked to the earlier and the later reward.

In line with my hypothesis, I find that individuals in CLOSE prefer to a greater larger extent the earlier future rewards compared to participants in the treatment DISTANT. Interestingly, I find this effect exclusively for males. Females show no significant treatment-dependant differences.

My finding enriches different strands of the literature. On the one hand, my study is - although this effect is constrained to males - the first which reports evidence that using a close or a distant tense makes a difference in intertemporal decision-making *within* one language. This result reflects a novel contribution to the research on the LSH (e.g. Chen, 2013; Sutter et al., 2018; Mavisakalyan et al., 2021). On the other hand, my study contributes to the literature on linguistic framing for decision-making (e.g. Brañas-Garza, 2007; He, 2017; Bruttel et al., 2021). Thereby, my findings add to studies about gender differences due to linguistic stimuli (e.g. Schubert et al., 1999; Mayer and Tormala, 2010; Ellingsen et al., 2013). In this context, my results provide further evidence on the "gender-as-culture" hypothesis (Mulac et al., 2001) which proposes that males and females treat language significantly different. Practically, the variation of close and distant tenses might reflect a

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[1]More than 700 citations for the paper of Chen (2013) were counted on GoogleScholar as of October 2022.

useful nudge to be applied by policy-makers. For instance, vaccination, professional dental cleaning or healthy nutrition could be made more attractive for males if their future benefits are associated with statements in a close tense instead of a distant tense.

The remainder of my paper is structured as follows. I start by reviewing the literature on the LSH as well as the literature on the role of linguistic framing for decision-making in section 2. Afterwards, I describe my methods in section 3 and show my results in section 4. Finally, I conclude and discuss my findings in section 5.

2 Literature Review

This research project contributes to different strands of the literature, especially to the *literature on the Linguistic Saving Hypothesis* and to the *literature on the role of linguistic framing for decision-making.*

Literature on the Linguistic Saving Hypothesis (LSH)

According to Chen (2013), differences in intertemporal decision-making go back to differences in the obligation of marking the future by using Future-Time Reference (FTR) in languages. Weak-FTR speakers (weak-FTR's) are able to talk about the future in present tense (*close tense*).[2] In contrast, strong-FTR speakers (strong-FTR's) are forced to use future tense (*distant tense*) in prediction-based contexts.[3] As weak-FTR's are able to associate present and future linguistically, Chen (2013) assumes, that the future seems to be temporally closer for them. As a consequence, weak-FTR's care more about future outcomes and behave more future-oriented compared to strong-FTR's (Linguistic Saving Hypothesis).

Starting with the study of Chen (2013), who reported that weak-FTR's save more, retire with more wealth, smoke less, practice safer sex and are less obese, a wide range of studies on the LSH has been published. For instance, Falk et al. (2018), Sutter et al. (2018) and Herz et al. (2020) showed that weak-FTR's are more patient compared to strong-FTR's. Pérez and Tavits (2017) and Mavisakalyan et al. (2018) reported a higher level of pro-environmental behavior for weak-FTR's compared to strong-FTR's. Even religiosity and the level of suicides has been linked to differences in FTR in the past. Lien and Zhang (2020) found that the rates of suicides are lower for individuals who speak a strong-FTR language whereas Mavisakalyan et al. (2021) showed higher religiosity among weak-FTR's compared to strong-FTR's. Both results were explained by the underlying assumptions of

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[2]In German you can say "Morgen regnet es". In Finnish you can say "huomenna on sateista". In both sentences a present statement is used to make predictions about the future.

[3]In English you can either say "It will rain tomorrow" or "It is going to rain tomorrow" to talk about future weather conditions. Thus, you have to apply a future tense making predictions.

the LSH: Under the context of suicide, talking about the future in a distant tense weakens the pain and unhappiness that will occur in the future which leads to fewer suicide commitments. When it comes to religiosity, weak-FTR's value future rewards of being faithful (as an afterlife in heaven) more highly since they locate it closer to their own temporal position.

Furthermore, it was shown that firms located in weak-FTR language countries are less myopic, give less weight to short-term income targets (Fasan et al., 2016), hold more cash (Chen et al., 2017), and face less problems with underinvestment compared to firms which are located in strong-FTR language countries (Kim et al., 2021). Moreover, the investment in research, development and patent generation is higher in weak-FTR language countries (Chi et al., 2020; Kong et al., 2022).

To isolate cultural motives as potential drivers of their findings, some studies compared the behavior in weak-FTR's regions with the behavior in strong-FTR's regions of the same country (Chen, 2013; Chen et al., 2017). Another focus was on differences in decision-making of weak-FTR and strong-FTR speakers who are located in multilingual regions such as South-Tirol, Italy (Sutter et al., 2018) or Röstigraben, Switzerland (Herz et al., 2020). Nevertheless, the question remains whether cultural motives might affect the findings (Roberts et al., 2015). Therefore, this project uses a different approach to disentangle cultural motives and examines the role of close and distant tenses for intertemporal decision-making *within* one language.

Literature on the role of linguistic framing for decision-making

The literature has shown that linguistic framing plays an important role for decision-making. It proved to impact the engagement in tasks (Bruttel et al., 2021), the willingness to share money with another individual (Brañas-Garza, 2007), intertemporal choices (Faralla et al., 2017) or the willingness to take risks (He, 2017). In this context, linguistic framing took different shapes. It referred to the application of native or foreign language, (Geipel et al., 2015; Costa et al., 2014), the variation of social contexts, (Capraro and Vanzo, 2019; Stark et al., 2019) the variation of outcomes in terms of losses or gains (Tversky and Kahneman, 1985), the usage of pronouns (He, 2017) or phrases (Bruttel et al., 2021).

The effect of linguistic framing was often different for males and females (e.g. Fujimoto and Park, 2010; Ellingsen et al., 2013; Chowdhury et al., 2017; Stark et al., 2019). Bruttel and Stolley (2018) showed that only males allocated more money due to statements which highlighted their responsibility whereas only females allocated more money due to statements which referred to their decision power and freedom of choice in a dictator game. Making use of a dictator game as well, Chowdhury et al. (2017) observed that females allocated more and men allocated less money under a taking-frame than under a giving-frame. When it comes to the ultimatum game, Sarlo et al. (2013) reported that males accepted more offers if the offers were framed as gains ("I give you") instead of losses ("I take") compared to females. Furthermore, Schubert et al. (1999) as well as Fagley and Miller (1997) showed

that women were more risk averse in a gain-frame but less risk averse in the loss-frame compared to men. Hasseldine and Hite (2003) revealed that males' tax compliance increased significantly if the consequences of non-compliance were framed negative, whereas females' tax compliance significantly increased if the consequences of compliant behavior were framed positive. Fujimoto and Park (2010) reported that women contributed significantly more to a good in a negative frame compared to males and Mayer and Tormala (2010) found that females reacted more positively to statements which involved the word "feel", whereas males reacted more positively to statements which involved the word "think".

There is also evidence on gender differences due to linguistic framing in intertemporal decision-making. If the statements which refer to the smaller but sooner rewards not only contain the size of the reward (as the later rewards do) but also the difference to the later reward framed as penalty, males chose significantly more often the smaller but sooner rewards compared to females. Interestingly, if the statements which are associated with the smaller but sooner and larger but later rewards are framed similarly, no gender differences occurred (Faralla et al., 2017).

I contribute to the literature on linguistic framing by providing evidence on the role of tenses for intertemporal decision-making. Thereby, I place a focus on potential gender differences.

3   Methods

3.1   German as research object

I need a language which enables to speak in a close *and* distant tense about the future to answer my research question. In this context, I make use of the German language. In general, German can be classified as weak-FTR language. This goes back to the opportunity to use the German tense *Präsens* in prediction-based contexts. *Präsens*, which main purpose lays in the marking of present events (Fandrych, 2018), is formed by a verb stem and a suitable personal ending. However, it can be used to talk about the future if adverbs of future time (like soon and tomorrow) or adverbial phrases of future time (like on Tuesday, next summer) are considered as in the following example: "Ich schreibe Dir *morgen* eine Mail."[4] Using Präsens in prediction-based contexts associates a present tense with a statement about the future.

Apart from *Präsens*, German speakers are also able to use the tense *Futur 1* in prediction-based contexts. *Futur 1* refers only to future events and does not require adverbs or adverbial phrases of future time. It is formed by the German counterpart to the English word "will" - *werden* - which directly refers to a future action and an infinitive as in the following example: "Ich *werde* Dir eine

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[4]Directly translated into English this would mean "I write a mail to you *tomorrow*."

Mail schreiben."[5]   Using *Futur 1* in prediction-based contexts results in the disassociation of the present and the future. If *Futur 1* would be the only grammatical tense in the German language to apply to the future, German would be classified as a strong-FTR language.

Transferring the underlying assumptions of the LSH to the different grammatical tenses in German, I would assume that the use of *Präsens* makes future events to be felt nearer because *Präsens* can be classified as a close tense. Similarly the use of *Futur 1* makes future events to be felt more distant since *Futur 1* can be classified as distant tense.

3.2   Experimental Design

I implement an incentivized laboratory experiment with two treatments in a between-subject design. In both treatments a multiple price-list - which is often used to observe intertemporal behavior (e.g. Coller and Williams, 1999; Dittrich and Leipold, 2014; Sutter et al., 2018; Chen et al., 2019; Herz et al., 2020) - stands at the center of the decision-making.

In my design the multiple price list consists of 11 binary decisions between two future rewards. The rewards differ with regard to the amount and the payment date. One reward is in all but 1 decision smaller and will always be paid after three weeks (hereafter referred to as the sooner reward). The other reward will be paid always after six weeks (hereafter referred to as the later reward). The sooner reward is fixed at 7.00 €. The later reward varies between 7.00 € and 12.00 € in steps of 0.50 €.[6] The treatments differ in the way I frame the sooner payment dates linguistically. In the treatment CLOSE I associate the earlier rewards with a statement in a close tense (*Präsens*), whereas in the treatment DISTANT I associate the earlier rewards with a statement in a distant tense (*Futur 1*). The later payment dates in both treatments are associated with a statement in a distant tense. I manipulate the earlier rewards instead of the later rewards since individuals tend to place a larger value on sooner rewards (Odum, 2011; Woolley and Fishbach, 2018) and less emotional attention to delayed rewards (Albrecht et al., 2013). These findings suggest that individuals might be less attentive to the linguistic manipulation of later rewards which, in turn, is in line with the finding of Chen et al. (2019): By examining the link between future tense and time preference within the Chinese language they varied the wording of the later choices using different Chinese tenses but found no treatment-effect.

Table 1 shows the linguistic manipulation in CLOSE, Table 2 the linguistic manipulation in DISTANT. In this context, X represents a proxy for the financial reward associated with the later payments dates, varying between 7.00 € and 12.00 €. Section 7.3 shows screenshots of the decision stages in both treatments from the experiment.

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[5]Translated into English this would mean "I *will* write a mail to you." As you can see *Futur 1* in German is closely related to the *will-future* in English.

[6]This gradation of the rewards was chosen due to individual switching points revealed in previous studies (Sutter et al., 2018; Herz et al., 2020).

Reward	Statement	Statement translated in English
Sooner Reward	"Sie erhalten 7.00 € in drei Wochen."	"You receive 7.00 € in three weeks."
Later Reward	"Sie werden X € in sechs Wochen erhalten."	"You will receive X € in six weeks."

Table 1: An overview of treatment CLOSE

Reward	Statement	Statement translated in English
Sooner Reward	"Sie werden 7.00 € in drei Wochen erhalten."	"You will receive 7.00 € in three weeks."
Later Reward	"Sie werden X € in sechs Wochen erhalten."	"You will receive X € in six weeks."

Table 2: An overview of treatment DISTANT

3.3 Hypothesis

Based on the assumptions of the LSH that the application of a close tense referring to future rewards makes these to be felt temporally nearer compared to the usage of a distant tense, my linguistic manipulation should have the following effect: the association of the sooner future rewards with a close tense (*Präsens*) in treatment CLOSE should make these rewards to be felt temporally nearer compared to the same rewards in treatment DISTANT which are associated with statements in a distant tense (*Futur 1*). Keeping in mind that individuals place more value on earlier rewards even if they are smaller (e.g. Read and van Leeuwen, 1998; O'Donoghue and Rabin, 1999; DellaVigna and Malmendier, 2006), I expect individuals to prefer to a larger extent the smaller but sooner future rewards in CLOSE compared to DISTANT.

Hypothesis: Individuals in the treatment CLOSE prefer to a larger extent the smaller but sooner future rewards compared to individuals in the treatment DISTANT.

3.4 Procedure

Experimental sessions took part from October 14 until December 16, 2021 at Potsdam Laboratory for Economic Experiments (PLEx). At the beginning of each experimental session, the participants had to sign an informed consent form. Subsequently, the experiment started at the screen whereby the computer's software assigned the participants to CLOSE or DISTANT at random. After having read the instructions, the participants made their decisions.[7] Subsequently, the participants had to answer

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[7]Please find the instructions (translated into English) in section 7.1.

questions of a post-experimental questionnaire in which they were asked for their age, financial well-being, gender as well as whether German reflects their native language and potential bilingualism. These aspects proved to play a significant role for intertemporal decision-making (Harrison et al., 2002; Read and Read, 2004; Jappelli and Pistaferri, 2010; Dittrich and Leipold, 2014; Carvalho et al., 2016; Pérez and Tavits, 2017) and language-dependent decision-making (Basnight-Brown and Altarriba, 2007; Schoonbaert et al., 2007; Keysar et al., 2012; Costa et al., 2014; Bruttel and Stolley, 2018).

At the end of the experiment, the participants were informed about their payment and the payment date. The payments were transferred[8] to the participants after three or six weeks - dependent on the individual choices and the random mechanism. The experiment took about 15-20 minutes. It was approved by an ethics committee (German Association for Experimental Economic Research e.V.) and computerized with ztree (Fischbacher, 2007). For the recruitment process I made use of ORSEE (Greiner, 2015). Data and codes are available in an Open Science Framework repository which can be accessed via this link: `https://osf.io/rwd6x/?view_only=c32053cff49941fa9ef22cd3bb616930`

3.5 Participants

In total 174 individuals took part in the experimental sessions. About 48 percent of the participants were randomly assigned by the computers software to the treatment CLOSE. The participants were on average 22.40 years old (*Standard Error* = 0.28) and earned on average 9.18 € (*Standard Error* = 0.13) by taking part in the experiment.[9] About 54 percent of the participants were male.

4 Results

I start my data analysis with focusing on the share of individuals who preferred smaller but sooner (7.00 € in three weeks) over larger but later rewards (7.50 - 12.00 € in six weeks) across the two treatments CLOSE and DISTANT. A larger share of individuals prefers smaller but sooner over larger but later rewards in the treatment CLOSE (Figure 1a). However, this tendency diminishes with growing size of the later reward. This finding is similar to the one of Herz et al. (2020) who compared intertemporal choices between German (weak-FTR's) and French people (strong-FTR's). If I focus on the amount of smaller but sooner choices by treatment variation (Figure 1b)[10], I observe that participants in CLOSE choose on average more smaller but sooner rewards (1.800 smaller but sooner rewards, *Standard Error* = 0.271) compared to participants in DISTANT (1.589 smaller but sooner

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[8]Keeping transaction costs constant, I transferred the money to the participant's bank account.

[9]9.16 € corresponded to 10.40 $ at the time of the experimental sessions.

[10]Due to the fact in 10 out of 11 binary choices one reward was smaller (the sooner one), the participants could make 10 smaller choices at most.

rewards, *Standard Error* = 0.240). This finding is in line with my hypothesis but not statistically significant ($p = 0.282$, one-sided t-test / $p = 0.330$, one-sided Wilcoxon rank-sum test).
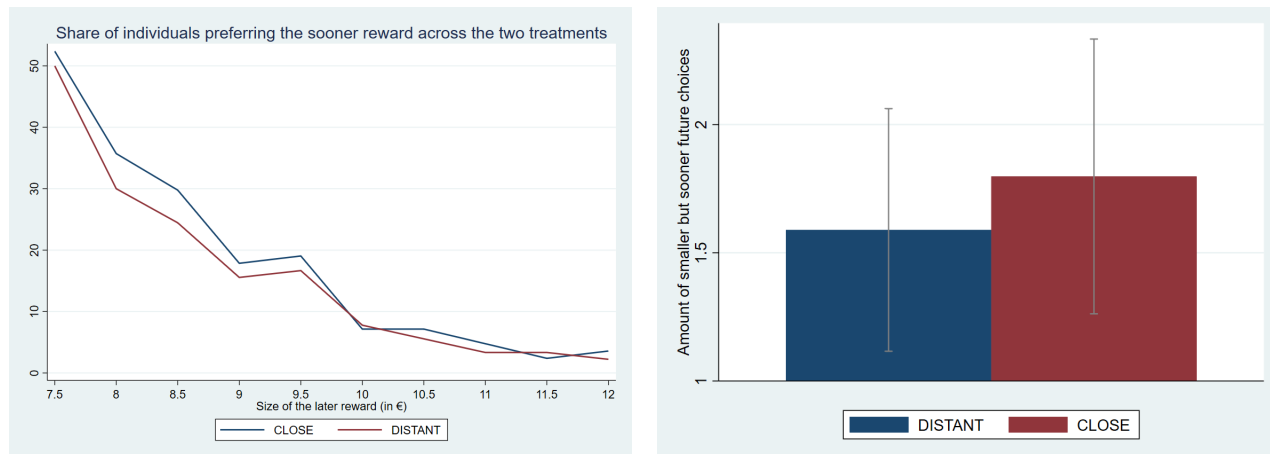
(a) Shares of individuals preferring smaller but sooner (7.00 €) over larger but later rewards across the two treatments (in %)

(b) Amount of smaller and sooner future rewards chosen across the two treatments with 95% intervals

Figure 1: Smaller but sooner future rewards by treatment variation

I proceed by analyzing the individual switch-point across the two treatments. The switch-point shows at which size of the later reward the participants switch from the smaller but sooner one. This procedure is established in the literature on multiple price lists (e.g. Chen et al., 2019; Herz et al., 2020) and gives evidence on the willingness to pay for earlier rewards.

In my study 89% of the participants reveal a single switch-point. They switch at a certain size of the later reward from the smaller but sooner one and prefer before switching the sooner and after switching the later reward. These individuals will be the main focus of my further analysis.[11,12] However, I will also refer to the results of non-unique switchers later.

Figure 2a shows at which sizes of the later rewards the participants decide to switch across the two treatments. Participants with an unique switch-point switch mainly at the lower sizes of the later

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[11]There are lots of studies (Holt and Laury, 2002; He, 2017; Sutter et al., 2018; Epperson and Gerster, 2021) which dropped observations who made it difficult to estimate a reasonable switch-point from the main data analysis. Thus, my procedure is in line with other literature applying multiple price lists in either lottery or intertemporal choice tasks.

[12]For my study I aimed at 153 independent observations across the two treatments to analyze individual switch-points. This target size goes back to an assumed effect size of $f^2 = 0.052$ (based on an increase of R^2 of 0.05 by my model).

I oriented at the studies of He (2017) and Bruttel and Stolley (2018) as well as the sample size of Chen et al. (2019) which reported 155 observations in linguistic manipulation of Taiwans to calculate the appropriate effect and sample size. In this context, $f^2 = 0.052$ is in the range between a small ($f^2 = 0.02$) and a medium effect size ($f^2 = 0.15$) according to Cohen (1988). I aim at a power of at least 0.80 and a p-value (α) of 0.05. 153 independent observations were calculated with G*Power (Faul et al., 2007). Thus, keeping only unique switchers into account (154) my sample size should be large enough to reach a power of at least 0.80.

rewards from the smaller but sooner one in both treatments. In CLOSE, in which we associated the sooner rewards with a statement in a close tense and the later rewards with a statement in a distant tense, the average switch-point is 8.032 ($Standard\ Error = 0.122$). In DISTANT, in which we associate the sooner and later rewards with a statement in a distant tense, the average switch-point is 7.985 ($Standard\ Error = 0.116$) (see, Figure 2b). The difference is not statistically significant ($p = 0.391$, one-sided t-test / $p = 0.324$, one-sided Wilcoxon rank-sum test).
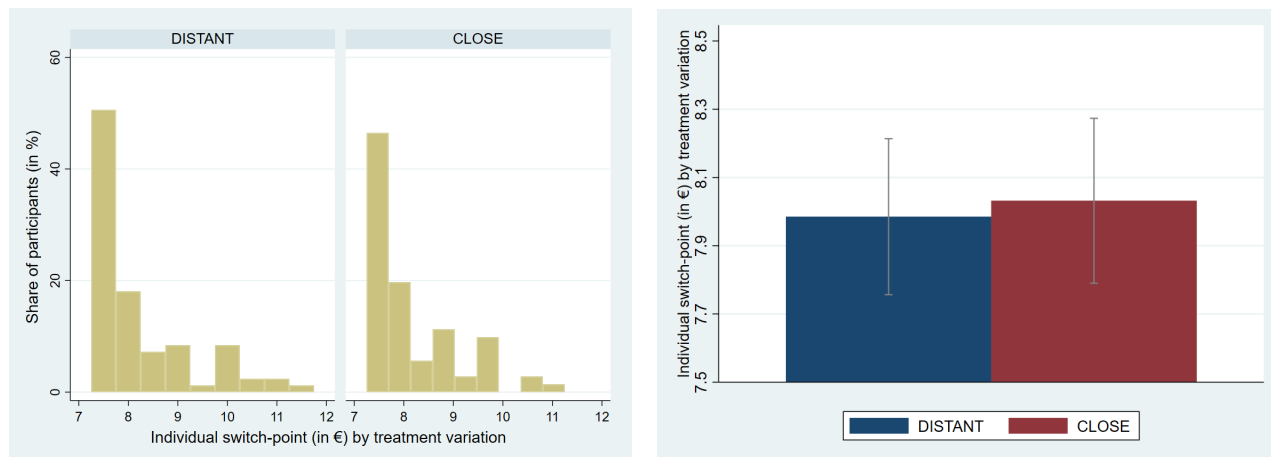
(a) Frequency of individual switch-points across the two treatments (in %)

(b) Average individual switch-point from the smaller but sooner to the larger but later reward in € by treatment variation with 95% intervals

Figure 2: Individual switch-points across the two treatments

I continue my data analysis by running regressions (see, Table 3) and include CLOSE as my variable of interest. CLOSE takes the value 0 if the participant takes part in DISTANT and 1 if the participant takes part in CLOSE. I consider as control variables female (takes the value 1 if the participant is female), age, financial well-being (takes the value 1 if the participant is able to pay a sudden bill of 400 € from his income or savings), German native speaker (takes the value 1 if the participant's native language is German) as well as Bilinguality (which takes the value 1 if the participant was raised bilingual with German and a strong-FTR language).[13]

At first I run regressions on the individual switch-point by using a tobit model (model (1a)), whereby I censor the data at the lower limit (7.25). Subsequently, I apply an OLS model (model (2a)) to

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[13]In the questionnaire I controlled for potential bilinguality. Based on the answers of the participants and according to the overview of weak- and strong-FTR languages as described in Chen (2013), I could assign individuals who were raised bilingual with a weak-FTR language (German) and a strong-FTR language (for instance, English, Russian, Turkish in my experiments) to one group. This seems to be useful as the findings of Pérez and Tavits (2017) and Ayres et al. (2020) have shown and the significant effects in my regression models underscore.

About 1% of the participants stated to be of diverse gender. For simplicity of the data analysis, I assigned them to the group of females. However, if I would exclude them from the data analysis or use in the regressions female as a continuous instead of a binary variable to account for diverse individuals my main findings would stay the same.

check the robustness of my findings. Although the treatment variation from DISTANT to CLOSE has - in line with my expectation - a positive effect on the individual switch-point, the estimates fail to be statistically significant.

There are also studies which use multiple price lists and do not focus on the individual switch-point in the regression analysis. Instead, they analyze the amount of specific choices (e.g. He, 2017). I also run regressions on the amount of smaller but sooner rewards as further robustness check. This procedure enables me to include those who reveal no unique switch-point. In this case, the lower limit is censored at 0 in the tobit model. I find that individuals choose in total more smaller but sooner rewards in CLOSE in a tobit (model (1b)) and an OLS model (model (2b)). These estimates fail to be statistically significant too.

Table 3: Regression analysis

	Individual switch-point				Amount of smaller choices			
	(1a)	(2a)	(3a)	(4a)	(1b)	(2b)	(3b)	(4b)
CLOSE	0.376	0.088	0.813**	0.467**	0.920	0.363	1.816**	1.047**
	(0.294)	(0.173)	(0.380)	(0.231)	(0.621)	(0.363)	(0.829)	(0.493)
CLOSE x Female			-1.039*	-0.855**			-2.003	-1.498**
			(0.577)	(0.351)			(1.232)	(0.740)
Female	-0.592**	-0.336*	-0.137	0.032	-0.665	-0.307	0.278	0.392
	(0.296)	(0.177)	(0.381)	(0.230)	(0.616)	(0.366)	(0.836)	(0.500)
Age	0.025	0.026	0.011	0.015	0.083	0.081	0.055	0.062
	(0.047)	(0.027)	(0.046)	(0.027)	(0.101)	(0.058)	(0.100)	(0.059)
Financial Well-Being	-0.813**	-0.381	-0.792**	-0.374	-0.943	-0.248	-0.918	-0.232
	(0.376)	(0.236)	(0.368)	(0.231)	(0.823)	(0.510)	(0.811)	(0.505)
German Native Speaker	-1.533**	-0.734**	-1.711***	-0.877**	-3.056**	-1.536**	-3.344***	-1.743**
	(0.586)	(0.356)	(0.583)	(0.354)	(1.225)	(0.756)	(1.223)	(0.755)
Bilingual (weak & strong-FTR)	-1.050*	-0.511*	-0.937*	-0.472	-2.590**	-1.241*	-2.434**	-1.201*
	(0.551)	(0.307)	(0.538)	(0.301)	(1.217)	(0.658)	(1.195)	(0.651)
Constant	8.076***	8.077***	8.300***	8.157***	-0.239	0.410	0.136	0.510
	(1.707)	(0.968)	(1.639)	(0.950)	(3.737)	(2.113)	(3.665)	(2.092)
N	154	154	154	154	174	174	174	174
$Pseudo\ R^2$	0.124		0.132		0.095		0.100	
R^2		0.269		0.303		0.261		0.281
Regression Model	Tobit	OLS	Tobit	OLS	Tobit	OLS	Tobit	OLS

Note: Standard errors are in parantheses. All models include session-dummies. *** p<0.010, ** p<0.050, * p<0.100

My results show no general treatment-effect of my linguistic manipulation. However, the literature has shown that gender makes a difference for intertemporal decision-making and for the effect of linguistic framing (e.g. Mayer and Tormala, 2010; Ellingsen et al., 2013; Dittrich and Leipold, 2014). Therefore, I introduce an interaction term CLOSE x Female to check potential gender effects.

I find a significant and positive main effect of CLOSE on the individual switch-point as well as a significant negative effect for the interaction term CLOSE x Female for a tobit (model (3a)) and an OLS

regression (model (4a)). For a better interpretation of my findings, Figure 3a displays the predictive margins. Males switch later in CLOSE compared to DISTANT, whereby this difference is statistically significant ($p = 0.045$). The contrary result holds for females: they switch later in DISTANT compared to CLOSE. However, this finding is *not* statistically significant ($p = 0.137$).[14] Whereas males and females' switching behavior is not different in DISTANT ($p = 0.890$), males switch significantly later in CLOSE compared to females ($p = 0.002$). If I investigate the interaction of gender and the treatment variation for the amount of smaller but sooner choices my findings are similar (regression models (3b) and (4b)). For this case, Figure 3b shows the predictive margins. Here, I find a significant effect of the treatment variation when it comes to males as well: they choose to a larger extent the smaller but sooner rewards if they are associated with a statement in a close tense (CLOSE) instead of a distant tense (DISTANT) ($p = 0.035$). The treatment-variation had no impact for females' decisions to select smaller but sooner rewards too ($p = 0.404$).
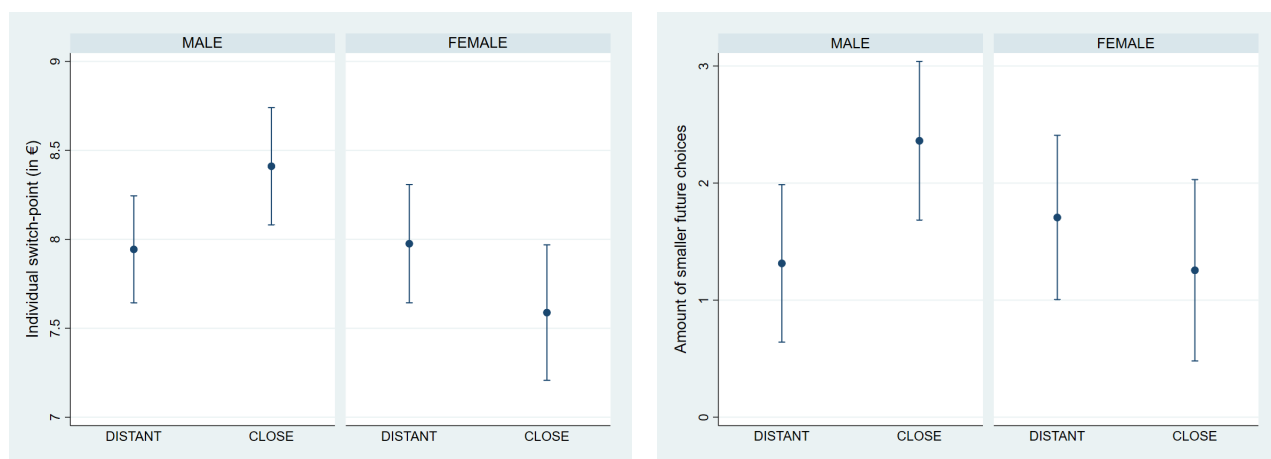
(a) Linear prediction of the treatment variation on the individual switch-point by gender

(b) Linear prediction of the treatment variation on the amount of smaller but sooner future rewards by gender

Figure 3: Linear predictions of the treatment variation on the individual switch-point/amount of smaller future choices by gender with 95% intervals

To sum up, my results show support for my hypothesis that individuals prefer to a larger extent smaller but sooner rewards over larger but later ones in CLOSE compared to DISTANT since they switch later. However, this result holds exclusively for males. For females, I find no significant effect of the treatment-variation. I observe these results although gender is not differently distributed across the two treatments ($p = 0.66$, two-sided proportion test).[15]

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[14]This holds for both models (tobit and OLS). Here, I showed the marginsplot of model (4a) since the significance level of the interaction effect proved to be higher ($p = 0.016$) which made it more likely to find a significant difference between the two treatments when it comes to females and their switching-behavior.

[15]Table 4 in the appendix shows the summary statistics of the control variables across the two treatments.

5 Discussion and conclusion

Against the background of the increasingly discussed "Linguistic Saving Hypothesis" (Chen, 2013), I studied whether the targeted use of a close and a distant tense affects intertemporal decision-making *within* one language. In this context, I decided to choose the German language to answer my research question since German enables its speakers to talk about the future either in a close or in a distant tense. I implemented a consequential laboratory experiment with German students on decisions between two rewards which were available at different dates in the future. Thereby, I varied the tenses with which I described the sooner future rewards between a close tense (treatment CLOSE) and a distant tense (treatment DISTANT).

My results show - in line with my prediction - a stronger preference for smaller but sooner over larger but later rewards in CLOSE compared to DISTANT. Interestingly, this finding holds exclusively for males. For females I find no effect of my treatment-variation. This finding is new in the literature on the LSH (Chen, 2013) and on linguistic framing for economic decision-making (Mayer and Tormala, 2010; Ellingsen et al., 2013; Chowdhury et al., 2017; Bruttel and Stolley, 2018).

In general there is lot of support that males and females treat with language differently. In this context, the term "gender-as-culture" has been proposed (Mulac et al., 2001) to highlight structural contrasts. For instance, males use more often prepositions, numbers, swearwords and articles compared to females (see, for an overview Schwartz et al., 2013). In contrast, females refer more often to family and friends in their language and use more frequently negations (see, for an overview Newman et al., 2008). Besides, previous studies have shown that males' and females' economic responses to linguistic stimuli are often significantly different (Mayer and Tormala, 2010; Ellingsen et al., 2013; Chowdhury et al., 2017; Bruttel and Stolley, 2018). My findings provide new evidence on the role of "gender-as-culture" in linguistics. While the studies of Newman et al. (2008) and Schwartz et al. (2013). have already reported that males and females use tenses significantly different in their daily lives[16], I additionally show that they also react differently to the variation of tenses when making economic choices.

My findings are complementary to those of Faralla et al. (2017) on gender differences due to framing in intertemporal choices. They did not find gender differences if the wording for the sooner and later rewards are similarly (treatment *standard monetary choice questionnaire*) which is in line with our finding in DISTANT in which we framed both rewards in a distant tense and find no gender differences either. However, Faralla et al. (2017) observed that males selected significantly more often the smaller but sooner rewards compared to females once the wording of the sooner rewards changed compared to *standard monetary choice questionnaire* and contains also information on the difference to the later reward (treatment *explicit penalty choice questionnaire*). We find a similar pattern in

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[16]Both studies reported that females use present significantly more often compared to males in their daily lives. However, they mainly focused on the English language in which present tense cannot be used in prediction-based contexts which makes their results hard to compare with our findings.

CLOSE in which we changed the wording of the sooner rewards compared to DISTANT. Then, we also find that males choose significantly more often compared to females the smaller but sooner rewards. My study has limitations. For example, I can only make a statement about the effect of a targeted use of close and distant tenses of the German language on intertemporal behavior. Therefore, it seems worth to study the targeted use of close and distant tense within further languages aside German and Chinese (Chen et al., 2019) which also enable their speakers to use both tenses when referring to the future. In this context, future research projects may involve languages, such as Danish, Dutch or Japanese to name just a few. Nevertheless, my findings can be used by policy-makers in German-speaking countries (Austria, German, Switzerland) as well as German-speaking regions (such as, South Tirol in Italy) to attain more socially desirable outcomes when it comes to males. For instance, policy-makers could highlight the positive future effects of vaccinations and professional dental cleaning, such as a lower probability to get infected or to undergo a serious surgery by using *close tense* instead of *distant tense* when referring to future benefits to make such actions more attractive. In this context, the variation of *close* and *distant tenses* might reflect a useful nudge.

6   Special acknowledgements

7 Appendix

7.1 Instructions

Welcome and thank you very much for your participation in this experiment. From now on we ask you to remain seated in your booth and do not talk with other participants anymore. Please turn also your electronic devices off. It is very important that you follow these rules. Otherwise, you will be excluded from this experiment and from the payment. If you have technical problems please raise your hands. During the experiment it is possible that you have to wait for some time. This is no error in the program but refers to the fact that the experiment can only proceed if all participants have left a stage.

Please read the following instructions carefully. If you have questions with regard to the instructions please raise you hands.

You are making decisions in an experiment today. In this context, you make in total 11 decisions between two financial rewards (**Option A** and **Option B**).

You receive Option A in three weeks.[17]   **You will receive Option B in six weeks.**

If you have made all your decisions, one of the 11 decisions will be selected at random. You will be informed about the randomly selected decision. We will carry out this decision and transfer the money at the specific date to you.

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[17]**You receive Option A in three weeks** was the wording in Close. In treatment Distant it was replaced by **You will receive Option A in three weeks.**

7.2 Balance of Covariates

	Treatment DISTANT	Treatment CLOSE	Difference
Female	0.458	0.423	0.035
	(0.055)	(0.059)	$p = 0.660$
Age	22.181	22.662	-0.481
	(0.373)	(0.500)	$p = 0.434$
Financial Well-Being	0.831	0.817	0.014
	(0.041)	(0.046)	$p = 0.815$
German Native Speaker	0.940	0.915	0.025
	(0.026)	(0.033)	$p = 0.560$
Bilingual (weak & strong-FTR)	0.048	0.141	-0.093
	(0.024)	(0.041)	$p = 0.046$

Table 4: Summary statistics of control variables

Note: Reporting means with standard deviations in parentheses based on the 154 observations which I focused on mainly. Difference column reports mean difference: CLOSE minus DISTANT and p-values based on two-sided t-tests and two-sided proportion tests.
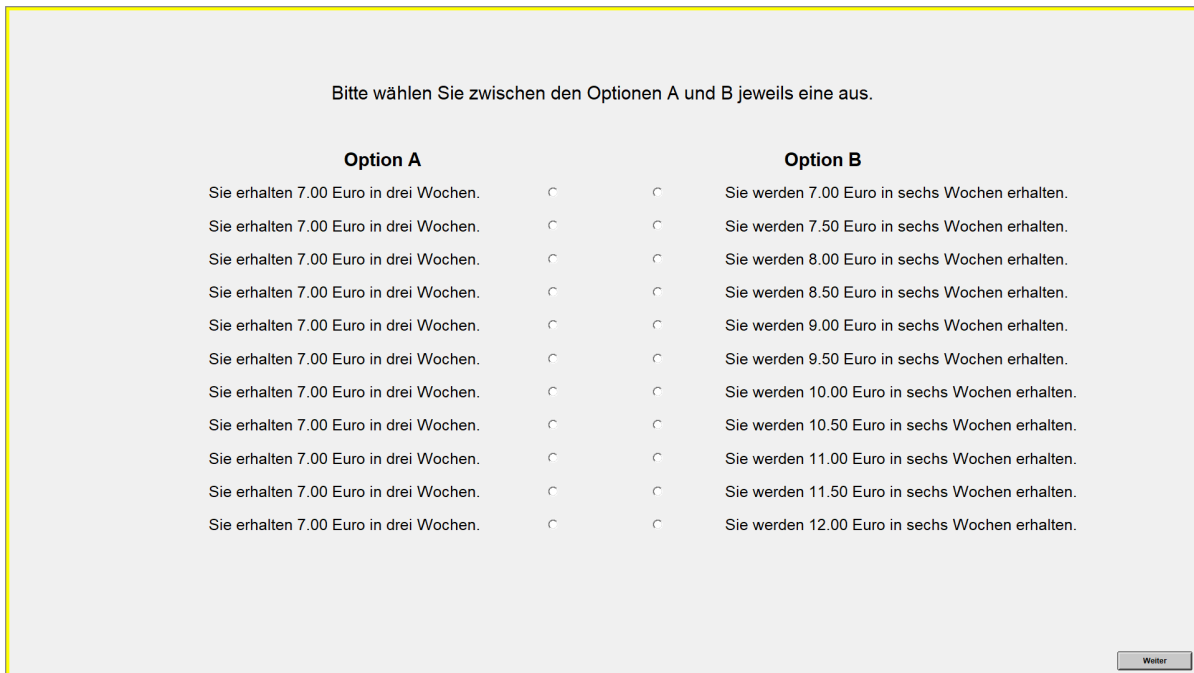
7.3 Screenshots

Bitte wählen Sie zwischen den Optionen A und B jeweils eine aus.

Option A			Option B
Sie erhalten 7.00 Euro in drei Wochen.	○	○	Sie werden 7.00 Euro in sechs Wochen erhalten.
Sie erhalten 7.00 Euro in drei Wochen.	○	○	Sie werden 7.50 Euro in sechs Wochen erhalten.
Sie erhalten 7.00 Euro in drei Wochen.	○	○	Sie werden 8.00 Euro in sechs Wochen erhalten.
Sie erhalten 7.00 Euro in drei Wochen.	○	○	Sie werden 8.50 Euro in sechs Wochen erhalten.
Sie erhalten 7.00 Euro in drei Wochen.	○	○	Sie werden 9.00 Euro in sechs Wochen erhalten.
Sie erhalten 7.00 Euro in drei Wochen.	○	○	Sie werden 9.50 Euro in sechs Wochen erhalten.
Sie erhalten 7.00 Euro in drei Wochen.	○	○	Sie werden 10.00 Euro in sechs Wochen erhalten.
Sie erhalten 7.00 Euro in drei Wochen.	○	○	Sie werden 10.50 Euro in sechs Wochen erhalten.
Sie erhalten 7.00 Euro in drei Wochen.	○	○	Sie werden 11.00 Euro in sechs Wochen erhalten.
Sie erhalten 7.00 Euro in drei Wochen.	○	○	Sie werden 11.50 Euro in sechs Wochen erhalten.
Sie erhalten 7.00 Euro in drei Wochen.	○	○	Sie werden 12.00 Euro in sechs Wochen erhalten.

Weiter

Figure 4: Decisions in CLOSE in original German language

Please select always one from the Options A and B.

Option A			Option B
You receive 7.00 euros in three weeks.	○	○	You will receive 7.00 euros in six weeks.
You receive 7.00 euros in three weeks.	○	○	You will receive 7.50 euros in six weeks.
You receive 7.00 euros in three weeks.	○	○	You will receive 8.00 euros in six weeks.
You receive 7.00 euros in three weeks.	○	○	You will receive 8.50 euros in six weeks.
You receive 7.00 euros in three weeks.	○	○	You will receive 9.00 euros in six weeks.
You receive 7.00 euros in three weeks.	○	○	You will receive 9.50 euros in six weeks.
You receive 7.00 euros in three weeks.	○	○	You will receive 10.00 euros in six weeks.
You receive 7.00 euros in three weeks.	○	○	You will receive 10.50 euros in six weeks.
You receive 7.00 euros in three weeks.	○	○	You will receive 11.00 euros in six weeks.
You receive 7.00 euros in three weeks.	○	○	You will receive 11.50 euros in six weeks.
You receive 7.00 euros in three weeks.	○	○	You will receive 12.00 euros in six weeks.

Weiter

Figure 5: Decisions in CLOSE translated into English

Figure 6: Decisions in DISTANT in original German language

Figure 7: Decisions in DISTANT translated into English

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