Come on and Take a Free Ride: Contributing to Public Goods in Native and Foreign Language Settings

DIEMO URBIG
University of Wuppertal, Germany, Indiana University

SIRI TERJESEN
American University, Norwegian School of Economics, Norway

VIVIEN PROCHER
Bergische Universität Wuppertal, Germany,
Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI), Essen, Germany

KATRIN MUEHLFELD
Trier University, Germany, Utrecht University, The Netherlands

ARJEN VAN WITTELOOSTUIJN
Tilburg University, The Netherlands, University of Antwerp,
Belgium, Cardiff University, United Kingdom

Business schools around the world must prepare their students for two realities: operating in an English-speaking business world and working in teams. As yet, there is limited understanding of how operating in a native or a foreign language impacts students' propensity to free ride in group settings. Building on general dual process theory of higher cognition and using a unique dataset of 276 Dutch business school students, we find that students are more inclined to free ride in a foreign language setting than in a native language setting. A student's conscientiousness attenuates this relationship such that this effect is stronger for students who are less conscientious, and weaker and almost absent for those who are more conscientious. After a student decides not to free ride but to positively contribute to the group, the specific level of contribution is not affected by foreign language. We discuss implications for practice, policy, theory, and future research.

English is the "*lingua franca*" in the business world (Tietze & Dick, 2013). Consistent with this view, the world's business schools, even those based outside

native English-speaking countries, are increasingly offering a large share of the coursework, and sometimes the entire program, in English. For example, the long-standing Global Alliance for Management Education (CEMS) facilitates exchange programs across 29 universities, which is only possible due to the high proportion of English-language business classes offered by each institution. Although it has long been known that people may encounter a variety of pitfalls in foreign language

contexts (Agar, 1993), recent research documents that people even think and act differently depending on whether they are operating in a native or foreign language setting (Akkermans, Harzing, & van Witteloostuijn, 2010; Keysar, Hayakawa, & An, 2012; Brannen, Piekkari, & Tietze, 2014). This raises concerns about how individual learning and group dynamics in classrooms may change due to teaching and learning in a foreign language.

A second critical concern that business schools face is how the actual classroom experience ensures that students develop good skills that will help them to navigate their future careers. One desired skill is cooperation, as evidenced by the emphasis on groups and teams across organizational behavior syllabi (Brown, Rynes, Charlier, & Hosmanek, 2013), increased focus on group projects (Ferrante, Green, & Forster, 2006), and growing recognition of collaborative and student-centered learning (Brooks & Ammons, 2003). Furthermore, recruiters are interested in students' group work experience, as many businesses rely on teams. Numerous students report negative experiences with groups that did not function well; a common complaint is that some individuals benefit from resources, goods or services, but do not contribute—a phenomenon known as the *free rider problem* (Brooks & Ammons, 2003). In fact, free riding is particularly prevalent among students in business and economics relative to their counterparts in other contexts, such as nursing (Cadsby & Maynes, 1998). Taken together, students' positive contributions to classroom activities and group work are desirable social outcomes that may not only impact how students learn, but also how they—later on and based on their study experiences—act in the workforce.

Our research addresses these two concerns with the following research question:

> *Does the use of a native or a foreign language in the classroom impact students' propensity to free ride?*

In addressing this knowledge void, we respond to calls to examine the role of language in management behavior (Brannen et al., 2014; Tenzer, Pudelko, & Harzing, 2014), the multicultural learning environment (Mintzberg & Gosling, 2002), and how business schools can best prepare their graduates for global careers (Egan & Bendick, 2008). Our study focuses on the causal effect of *using a foreign language*, because, besides the obvious factor of an intercultural group composition, using a foreign

language is a crucial element in multicultural learning environments.

We build on recent advancements in dual-process theory of higher cognition (Evans, 2008; Evans & Stanovich, 2013) to derive hypotheses about how using a foreign language may affect students' propensity to free ride. We also examine the antithesis of free riding, referred to as "prosocial behavior," which is voluntary behavior that is intended to benefit others (Eisenberg, Fabes, & Spinrad, 2007). We test these hypotheses with an in-class experiment measuring contribution in the context of a public goods game. Extending prior research, we suggest this effect is strongest for the decision of whether to contribute, but less strong or even absent for students' subsequent decisions about the specific level of contribution, including the specific degree to which peers' contributions are matched. Utilizing unique data gathered from two points in a semester and including a diverse set of control variables, we find that students are less inclined to contribute to a public good and to positively reciprocate their peers' contributions in a foreign language setting than in a native language setting. Furthermore, we find that conscientiousness—a personality trait that corresponds to more deliberate thinking—attenuates the language-induced effect.

THEORETICAL BACKGROUND

We frame our contribution based on general dual-process theory of higher cognition, which describes how individuals utilize two distinct types of thinking that, in turn, influence their decisions (e.g., Evans, 1989; Evans & Stanovich, 2013; Sloman, 1996; Stanovich, 1999). This framework has been successfully employed to understand the cognitive processes that encourage or hamper prosocial behavior (e.g., Palfrey & Prisbrey, 1997; Rand, Greene, & Nowak, 2012), as well as to investigate the effect of using a foreign language on behavior in ethical dilemmas (Costa et al., 2014) and on other patterns of economic behavior such as loss aversion (Keysar et al., 2012). We begin by introducing the dual-process framework of higher cognition (to simplify descriptions; hereafter, we use the simpler label: dual-process theories), and then explicate the linkage to social behavior and the potential influence of using a foreign language on prosocial or free-riding behavior.

Dual-Process Framework

Dual-process theories assume that there are two general types of thinking associated with different

parts of the brain (Evans & Stanovich, 2013). *Type 1* processes are intuitive and contextualized. Typical correlates include rapid, autonomous, nonconscious, and emotional processing. *Type 2* processes are reflective and decontextualized, involving higher cognitive functions and working memory, and are characterized as being rather slow, controlled, conscious, and deliberate. Although Type 1 processing is often assumed to be the default response, Type 2 processing may intervene and override Type 1 processing by triggering cognitive decoupling and hypothetical thinking (Evans, 2007; Evans & Frankish, 2009).

Individuals, however, may not be motivated to engage in Type 2 processing, but will instead rely on Type 1 processing, for example, because they lack incentives or an understanding of the relevance of the decision. The individual will attempt to strike a balance between minimizing cognitive effort incurred by Type 2 reasoning and satisfying current motivational concerns. That is, an individual will only invest the effort that will satisfy current goals. If the behavior under consideration is very important to the individual, then he or she will be less likely to use intuitive Type 1 processing and more likely to use Type 2 processing (Chen & Chaiken, 1999). Type 2 processing might also be activated by metacognitive experiences of difficulty or disfluency during the process of reasoning; that is, when individuals recognize the need and are, consequently, motivated to engage in more effortful reasoning (Alter, Oppenheimer, Epley, & Eyre, 2007; Thompson, 2009). Furthermore, there is heterogeneity among individuals with respect to their general tendencies to engage in systematic and reflective Type 2 processing (Thompson, 2009).

Although individuals may engage in analytic Type 2 processing, their decisions and resulting behavior may nevertheless reflect less analytic Type 1 processing. First, Type 2 processing can agree with Type 1 processing. Second, Type 2 processes often work on representations formed by Type 1 processing and may "inherit" related biases (Thompson, 2009). Third, individuals who face complexity or insufficient cognitive resources and a lack of working memory may be unable to rely on Type 2 processing, and will, thus, fall back on Type 1 processing (Thompson, 2009). In sum, individuals must balance between intuitive Type 1 and more deliberate Type 2 processing. Disconnectedness, complexity, and difficulties may trigger Type 2 processing (Thompson, 2009), but when these difficulties become too large to manage, an individual's

Type 1 processing then determines his or her behavior.

These two types of thinking, the intuitive and heuristic Type 1 and the more deliberate and analytic Type 2, are based in very different parts of the brain. They employ different capacities of working memory, and use different degrees of cognitive decoupling and mental simulation (Evans & Stanovich, 2013). The two types are likely to lead to substantially different behavioral outcomes, an observation we explore for students' fundamental inclination toward either prosocial or free-riding behavior in a classroom.

Prosocial Behavior in a Public Goods Dilemma

Prosocial or free-riding behavior in a classroom setting can be abstractly reflected in a public goods game in which members of a group voluntarily contribute more or less to a group project and, later on, every group member receives an equal share from the group's overall project returns. The returns to the group are larger than the individuals' total investments; however, the returns are shared. The dilemma results from the fact that due to the sharing, each group member's individual return to increasing his or her contribution—assuming no change in the other group members' contributions—is less than his or her contribution. Thus, if individuals think about their own contributions, then the individual benefit of contributing is lower than the incurred individual cost. When making their decisions, students are, therefore, all individually better off if every member contributes, but each one has an incentive to free ride; that is, to receive returns from the others' contributions, but not to contribute themselves. There are two patterns of prosocial behavior. First, if one does not know what others contribute, then contributing (more) to the public good displays a prosocial behavior. Second, if one knows (or has a good guess, e.g., by experience) what others contribute, then (more) positively reciprocating the others' contributions displays a prosocial behavior (Cox, Lobel, & McLeod, 1991). The latter pattern is referred to as conditional cooperation or conditional contribution (Fischbacher, Gächter, & Fehr, 2001; Hermann & Thöni, 2009; Kocher, Cherry, Kroll, Netzer, & Sutter, 2008). While contributing more even when one knows that others do not contribute is probably practically less relevant prosocial behavior, conditional contribution has been argued to be a key element of effective collective action (Ostrom, 2000): Small changes in

individuals' tendencies to conditionally contribute can substantially alter and eventually harm collective action.

Students frequently face decisions about how much effort to contribute to a public good, such as a group assignment. Initially, when an individual does not know how much others will contribute, he or she will make first commitments, and over time will see how much others contribute and will then adjust his or her own commitment. If a student's grade is based on the final group outcome rather than individual contribution, he or she might be inclined to contribute less or nothing at all—that is, to free ride—especially if other group members make substantial contributions. Although free riding is rational from an individual perspective, if many or all members of a group free ride, the quality of group outcome suffers. For example, a group that fails to hand in the group assignment will earn a failing grade. Moreover, a desired outcome in a classroom is that all students positively contribute to the learning experience. If students learn that it is acceptable to not contribute to group work, there are potential issues when these students join the workforce and display similar free-riding behavior in work teams.

Dual-process theory can explain individuals' decision making with respect to prosociality in such public goods games (e.g., Rand et al., 2012; Rand et al., 2014; Verkoeijen & Bouwmeester, 2014). This line of research considers whether the two types of thinking processes (more intuitive Type 1 or more deliberate Type 2) are related to different decisions in public good games: Are individuals intuitively selfish and only behave prosocially through deliberate thinking and active self-control, or are individuals intuitively prosocial, but reflection and deliberation causes them to behave selfishly? Researchers seeking answers to these questions have manipulated the experimental conditions such that decision-making processes shift toward Type 1 processing; that is, by creating a sufficiently high cognitive load such that Type 2 processing is rendered ineffective and the resulting behavior becomes more intuitive, and thus, reflects Type 1 processing. A substantial body of empirical research associates intuition with cooperation, such that intuition triggers cooperation under time pressure and other cognitive load manipulations (Cornelissen, Dewitte, & Warlop, 2011; Rand et al., 2012, Rand et al., 2014; Schulz, Fischbacher, Thöni, & Utikal, 2014; for exceptions, see Cappelletti, Güth, & Ploner, 2011; Tinghög et al., 2013; Verkoeijen & Bouwmeester, 2014).

In sum, these findings suggest that any manipulation that shifts individuals' thinking toward more deliberate and reflective processing likely induces them to engage in more pronounced free-riding behavior. In contrast, any manipulation that prompts individuals to think more intuitively makes them more likely to engage in prosocial behavior.

Language and Prosocial Behavior

Prior research has shown that using a foreign language may shift individuals' reasoning toward a more reflective, deliberate Type 2 processing rather than an intuitive, automatic Type 1 processing (Keysar et al., 2012). These effects arise because operating a foreign language entails greater psychological distance and fewer emotional responses compared to using a native language (Alter et al., 2007; Keysar et al., 2012). However, despite being very proficient, individuals may nevertheless experience difficulty or disfluency, which would cue them to adopt systematic Type 2 processing (Alter et al., 2007). If foreign language use triggers a difficulty and disfluency sufficiently strong to create confusion and a lack of understanding of the experiment's rules, deliberate and systematic thinking is not likely to provide a solution and, therefore, individuals would be more likely to rely on Type 1 processing in the foreign language setting. Keysar and colleagues (2012) excluded individuals who could not demonstrate a clear understanding of the experiment, thus minimizing the potential for this kind of switching back from Type 2 to Type 1 thinking.

Costa and colleagues (2014) apply this logic developed for individual economic behavior to decision making in an ethical dilemma in which sacrificing one man can save five other men. Compared to a native language setting, individuals operating in a foreign language setting are more likely to make the more utilitarian decision to sacrifice the one man for the five men. We are interested in a dilemma that involves a choice between a more socially attractive and a more individually attractive alternative, rather than a choice between two moral imperatives favoring one or the other alternative (i.e., favoring the essential rights of every person vs. favoring the greater good). Thus, results by Costa and colleagues cannot be directly transferred to our social dilemma context. For the ethical dilemma, Costa et al. (2014) also demonstrate that relatively minor changes in framing the structure of the decision impact their findings. In a version of their experiment in which people could influence—that is, direct—an external force to kill the

one man instead of the five men rather than themselves (i.e., sacrificing the other man to keep the external force from killing the five), Costa and colleagues (2014) did not observe a language effect. Costa and colleagues (2014) argue that the two situations differ only in the sort of decisions that lead to the outcomes, but do not differ in the final outcomes. The differences make the second setting less emotionally aversive, triggering a less emotional and less intuitive decision; that is, Type 2 processing (Alter et al., 2007). Thus, elements of a decision context that are not related to the ultimate outcomes can influence the degree to which foreign language use affects individuals' behaviors.

We extend Costa and colleagues' (2014) suggestion that the specific structure of the decision can influence individuals' tendencies to engage in Type 1 or Type 2 thinking. We assert that in complex decisions that involve multiple, but decomposable steps, that is, parts that could also be separately decided on, individuals may use different types of thinking for different parts. More specifically, we suggest that in public goods games, we should distinguish two steps in the contribution decision. The first decision is *whether or not* to positively contribute or whether or not to positively reciprocate others' contributions. The second decision (conditional upon the first decision to actually contribute or reciprocate) is *how much* to contribute. In case the outcome of the first decision is that individuals do not contribute at all, they obviously need to neither specify an amount nor consider the balance of other group members' contributions. As a result, this decision requires substantially less cognitive effort. We argue that once individuals actively think about the trade-offs between contributing more versus contributing less, which might include thinking about others' contributions and related mental simulations, they tend to perceive a more difficult and complex decision. This complexity and related disfluency triggers more deliberate Type 2 processing (Alter et al., 2007; Evans & Stanovich, 2013). As a consequence, we expect that the initial binary decision of whether or not to positively contribute or reciprocate is more susceptible to effects of foreign language use on Type 1 versus Type 2 processing and, consequently, more or less free-riding behavior.[1]

Taken together, these arguments suggest that compared to Type 2 processing, Type 1 processing is associated with less free-riding behavior. Furthermore, as long as an individual's cognitive load is not exceeded, foreign language use triggers a more deliberate thinking, and this effect is stronger for the initial binary decision of whether or not to positively contribute or reciprocate others' contributions. Thus, we expect:

> *Hypothesis 1: Students are less inclined to positively contribute and reciprocate in a foreign language setting than in a native language setting; however, the students' specific level of contribution is less or even not affected.*

In addition to the external context of the foreign language setting, we expect that individuals' internal dispositions might moderate the foreign language effect in decision-making processes. This line of argument rests on recent developments in dual-process theories, specifically Stanovich's model of the mind that links an individual's regulatory states of mind to differences in decisions (Thompson, 2009; Evans & Stanovich, 2013; Stanovich, 2009). According to Evans and Stanovich (2013: 230), individual differences in thinking dispositions are measures of the reflective mind and include "the disposition to think extensively about a problem before responding, […] the tendency to think about future consequences before taking action, and the tendency to explicitly weigh pluses and minuses of situations before making a decision." Considering the language context, we expect that individuals who are predisposed to deliberate thinking will be less affected by using a foreign language. That is, the language-triggered shift to a more deliberate thinking matters less because these individuals are already using more deliberate thinking processes. This leads to our second hypothesis:

> *Hypothesis 2: Students are less inclined to positively contribute and reciprocate in a foreign language setting than in a native language setting; however, the effect is stronger for students who are less predisposed to deliberate thinking.*

DATA AND METHODOLOGY

Data

We conducted a survey and a public goods game in a compulsory introductory course on organization

---

[1] Empirical observations in the context of charitable giving also indicate that framing effects, such as the suggested amounts of contributions, may differently affect the response rate vis-á-vis the amount given (e.g., Karlan & List, 2007). Separating the decision to positively contribute from the decision about how much to contribute is, thus, also advisable based on these previous empirical studies.

sciences for first-year undergraduate business students at a major university in the Netherlands. In September 2012, all students were randomly assigned to tutorial groups consisting of approximately 30 students each. At the beginning of the course, students were asked to participate in an online survey to collect information about their sociodemographics, personality traits, and culture-related characteristics. In November 2012, the students participated in a monetarily incentivized experiment during the regular tutorial sessions. The experiment was run either in Dutch or English. This choice was randomized by tutorial groups, resulting in roughly half the tutorial groups playing the public goods game in Dutch or English. Participation was voluntary; however, only students who completed the online questionnaire and participated in the experiment were eligible for monetary prizes.

We ensured participant's anonymity in the survey and experimental data by matching each student's self-created 12-digit code comprised of unique personal information, such as the first two letters of the students' birthplace. The temporal separation of the elicitation of sociodemographic and personality variables and the subsequent experiment, as well as the strict enforcement of anonymity, substantially reduced the potential for common-method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). After excluding unmatched and missing data from the public goods game and unreasonable responses in the control variables, the sample consisted of 288 participants. We further excluded 12 respondents who indicated that Dutch is not their native language, leading to a final sample of 276 students with 125 participating in the foreign language (English) and 151 participating in the native language (Dutch) treatment. The average age of participants was 18.7 years, and 32.6% of the respondents were females.

Experimental Design: Public Goods Game

The experiment begins by giving each student a budget of 20 euro that can be invested into a group project in increments of 1 euro; for example, 0 euro, 1 euro, or up to 20 euro. Each group consists of three students. In addition to the individual money endowment, each student also receives 60% of the whole student group's contribution to the project. All group members attain the maximum payoff (36 euro) when each member invests the full initial endowment in the public good (20 euro).

Students played two versions of the game: (1) an unconditional contribution setting where all three group members make decisions without knowing what the others contribute, and (2) a conditional contribution setting where two group members do not know what others contribute, but one student in a group can condition his or her contribution on what the others contributed. That is, this selected student does not literally know what others contribute, but can say, for each possible case, what he or she would do. These two settings allow us to elicit both students' contributions to a public good when they do not know what others contribute (e.g., at the beginning of group work) and the degree of reciprocation; that is, their contribution when they know what others contributed (e.g., after experiencing some group work). In the case that he or she would be the selected player in the conditional setting, each student indicates his or her own contribution for each possible average contribution of the other two group members (between 0 and 20 euro in increments of 0.50 euro). This enables us to study the degree to which students will reciprocate prosocial behavior.

After initially introducing the experimental setting, we asked 13 control questions. These questions relate to various conditions and behaviors of group members, as well as how payoffs may change when the individual's contribution or a group member's contribution increases by one euro. Once all students have answered those questions, we provide the correct answers to the students and explain the rules to ensure that there is a clear understanding of the task setting. For the English-language tutorial groups, this follow up ensures that there is no information deficit due to the foreign language setting.

We implement the game using the strategy method (Selten, 1967), which has been shown to be valid in similar settings (Brandts & Charness, 2011; Fischbacher, Gächter, & Quercia, 2012), and the random lottery method (Starmer & Sugden, 1991). That is, we ask students for their decisions to contribute to the project in both the conditional and the unconditional settings and for the conditional setting for both roles, that is, being the selected one who can condition the behavior, and being among the others. We randomize the order of presentation of both settings. After the experiment, we randomly select four groups (two per setting) that are paid in real terms according to their decisions. These groups received amounts between 20 and 34 euro (about 26 to 45 USD).

Variables

We describe the students' behavior in the unconditional and conditional contribution setting by two types of decisions. As noted earlier, the first decision refers to a basic behavioral pattern; that is, whether or not students positively contribute to the public good in the unconditional setting or whether they positively reciprocate others' positive contributions in the conditional setting. The second decision refers to the specific level of contributions.

Positive contributor (PC) is a dummy variable indicating whether or not an individual contributes a positive amount in the unconditional setting. Overall, 134 (49%) students contribute a positive amount to the public good and 142 (51%) students contribute zero.

Conditional contributor (CC) is based on a classification of three basic behavioral patterns for public goods games that allow for conditional contributions (e.g., Fischbacher et al., 2012). Individuals are classified as *conditional contributors* if their contributions are positive at least once and do not decrease when others increase their contributions. That is, in at least one instance, when an individual was aware that others made a higher contribution, then he or she positively reciprocated and in no case did he or she decrease the contribution.

Individuals who either do not contribute at all or display negative reciprocity are classified into the remaining two classes: *free riders* who do not contribute anything for any level of the others' contributions, and *hump-shaped contributors* who increase their contribution with increasing contributions by others for smaller levels of others' contributions, but not so for higher levels of others' contributions. That is, hump-shaped contributors display a sort of free-riding behavior for higher levels of other's contributions: They decrease their contribution at least once and do not raise it for even higher levels. In our sample, 100 participants (36%) are conditional contributors, 149 (54%) are free riders, 22 (8%) are hump-shaped contributors, and 5 (2%) cannot be classified.[2] Because the low number

of hump-shaped contributors is insufficient for further statistical analysis, we focus our subsequent analysis on the two largest groups of "conditional contributors" and "free riders." These two groups' prevalence is consistent with prior studies (Fischbacher et al., 2001; Gächter, 2007).

Individuals who positively contribute to the public good are further classified by their specific *level of contribution* (LC), which is a full euro amount in the range of 0 to 20 euro. In the unconditional setting, the level of contribution is a single value. Among all individuals who positively contribute, the average contribution is 11.24 euro (for the others, the average is zero). In the conditional setting, participants provide 41 values, one for each possible average contribution of other group members. Figure 1 provides the average level of contributions for the four classes: conditional contributors, free riders, hump-shaped contributors, and others. As constructed, the conditional cooperators contribute more for higher levels of others' contributions and hump-shaped contributors' average contribution drops for higher levels of others' contributions. Overall, the four groups' relative patterns are consistent with prior studies (e.g., Fischbacher et al., 2001; Gächter, 2007).

Foreign language setting (FLS) is a dummy variable that concerns the language of the experimental session. English as the foreign language is coded as 1 and Dutch as the native language is

---

[2] To further improve our generic classification, four participants are manually classified as conditional contributors. These individuals once decreased their contribution by the smallest amount possible (50 cents), but otherwise display behavior that perfectly matches the pattern of conditional contributors. Furthermore, two participants are manually classified as free riders because, for a very small range of low levels of others' contributions, they contribute the smallest amount possible (50 cents), but otherwise their behavior matches the free riders' behavioral pattern.
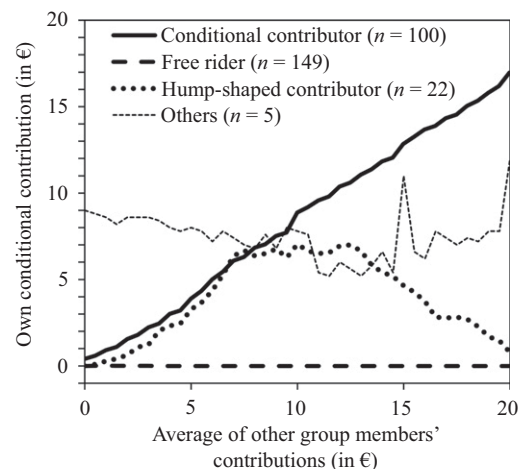

FIGURE 1

Participants' Average Level of Contribution in the Conditional Contribution Setting for Each Level of the Other Group Members' Contribution for Each Type of Behavioral Pattern

coded as 0. The participation split is 45% (English) and 55% (Dutch).

Individual disposition to engage in deliberate thinking is operationalized through the conscientiousness dimension in prominent personality models. It is defined in the more recent HEXACO personality inventory (Ashton & Lee, 2007, 2009) and in the older Big-Five framework (McCrae & John, 1992) in a way such that persons who score high on conscientiousness organize their time and their physical surroundings, work in a disciplined way toward their goals, strive for accuracy and perfection, and *deliberate carefully when making decisions*. In contrast, individuals who score low on conscientiousness tend to be unconcerned with orderly surroundings or schedules, avoid difficult tasks or challenging goals, are satisfied with work that contains some errors, and *make decisions on impulse or with little reflection* (Lee & Ashton, 2004; Ashton & Lee, 2009). The conscientiousness subscale of the HEXACO personality inventory, consisting of 10 Likert-type items with responses from 1 = *strongly disagree* to 5 = *strongly agree*, achieves good internal reliability ($\alpha = 0.81$).

Individual-level control variables include *gender* (0 = male; 1 = female), *age*, and all remaining basic personality characteristics operationalized through the HEXACO personality inventory (Ashton & Lee, 2007, 2009; each based on 10 Likert-type items with responses from 1 = *strongly disagree* to 5 = *strongly agree*): honesty-humility ($\alpha = 0.75$), emotionality ($\alpha = 0.82$), extraversion ($\alpha = 0.82$), agreeableness ($\alpha = 0.71$), and openness to experience ($\alpha = 0.75$). To control for students' language background, which could influence their reactions to foreign languages (Dewaele & Shan Ip, 2013) and, specifically their basic tendency to switch between Type 1 and Type 2 processing (Costa et al., 2014), we control for the *age at which students started learning English (in years of age)*, their self-reported level of *proficiency in understanding English* (average of two items related to understand written English and spoken English with 7-point scales from 1 = *very poor* to 7 = *excellent*; $\alpha = 0.79$), and a dummy variable for whether or not they have *lived in an English-speaking country* for 3 months or more. Because behavior in a public goods experiment might depend on how many students are personally acquainted with one another (Gächter, 2007), we ask each participant to report how many *students from class they personally know* (one missing value set to sample average). Tables 1 and 2

TABLE 1
Individual-Level Summary Statistics

		M	SD	N
Independent variables				
1	Gender (female)	0.33	0.47	276
2	Age	18.73	1.05	276
3	Age when learning English	9.87	2.29	276
4	English proficiency	5.18	1.16	276
5	Lived in English-speaking country	0.05	0.23	276
6	Number of classmates known	17.35	11.15	276
7	Personality: Honesty-Humility	3.16	0.57	276
8	Personality: Emotionality	2.82	0.64	276
9	Personality: Extraversion	3.55	0.56	276
10	Personality: Agreeableness	3.08	0.52	276
11	Personality: Openness to experience	2.76	0.63	276
12	Personality: Conscientiousness	3.43	0.61	276
13	English treatment	0.45	0.50	276
Dependent variables: Unconditional setting				
14	Positive contributor	0.49	0.50	276
15	LOC if positive contribution	11.24	4.86	134
Dependent variables: Conditional setting				
16	Conditional contributor	0.36	0.48	276
17	Free rider	0.54	0.50	276
18	Hump-shaped contributor	0.05	0.23	276
19	Others	0.02	0.13	276
20	LOC if conditional contributor	8.39	6.47	100

Note: Abbreviations: LOC = level of contribution; SD = standard deviation; N = number of observations.

provide summary statistics and correlations for individual-level characteristics.[3]

RESULTS

We first compare the probabilities of prosocial instead of free-riding behavior between both the Dutch and the English language treatments and for both the unconditional (probability of positive contribution) and the conditional contribution settings (probability of conditional contribution). There are—as theoretically expected—fewer positive and fewer conditional contributors and, thus, more free

---

[3] Note there are only two variables that vary within individuals: the conditional contribution depending on the level of others' average contributions and the level of others' average contributions. Due to the experimental manipulations, the latter variable has the same distribution for all individuals, and thus, does not vary between individuals. The former may vary between individuals, which is why we included the individual's average response as an individual-level characteristic. The overall correlation of these two variables including the within-individual variation is 0.78 with $p < 0.001$ (for the relevant subsample, i.e., conditional contributors). Given that conditional contributors are defined based on increasing their contribution depending on the level of others' average contributions, this correlation is not surprising.

TABLE 2
Binary Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Independent variables																		
1 Gender (female)	1																	
2 Age	-.04	1																
3 Age when learning Engl.	.07	-.00	1															
4 English proficiency	-.15*	.13*	-.34***	1														
5 Lived in Engl.-speak. ctr.	.04	.06	-.25***	.04	1													
6 Number of classmates known	-.09	-.10+	-.18**	.03	-.06	1												
7 Honesty-Humility	.28***	.09	.09	-.03	-.06	-.10	(.75)											
8 Emotionality	.53***	-.20***	.08	-.23***	-.01	-.06	.06	(.82)										
9 Extraversion	-.16**	.11+	-.08	.12*	.03	.17**	-.08	-.31***	(.82)									
10 Agreeableness	-.05	.04	.07	-.11+	.01	-.01	.16**	-.09	-.09	(.71)								
11 Openness to experience	-.02	.14*	-.19**	.22***	.15**	.01	.12*	.01	.00	-.03	(.75)							
12 Conscientiousness	.20***	.00	.18**	-.17**	-.06	-.10+	.26***	.16**	-.06	.04	-.02	(.81)						
13 English treatment	.07	.01	.04	-.06	.07	-.01	.11+	.03	-.12*	.07	.21***	.07	1					
Dependent variables: Unconditional setting																		
14 Positive contribution	.16**	-.05	-.01	.01	.05	-.12*	.13*	.11+	-.02	.03	.08	-.02	-.08	1				
15 LOC if positive contribut.	-.14	-.09	.02	.02	.04	.05	.01	-.02	-.13	.06	.12	.02	-.07	—	1			
Dependent variables: Conditional setting																		
16 Conditional contributor	.20***	-.04	.09	-.08	-.01	-.14*	.06	.16**	-.09	.04	.08	.04	-.05	.4***	-.01	1		
17 Free rider	-.20***	.07	-.06	.05	.00	.12*	-.10	-.19**	.14*	-.08	-.08	-.01	.07	-.5***	-.10	-.82***	1	
18 Hump-shaped contributor	-.03	-.08	-.03	.06	.05	.07	.03	.06	-.02	.01	.03	.00	.03	.14*	.05	-.22***	-.32***	1
19 Others	.08	.06	-.04	-.03	-.03	-.11+	.08	.03	-.13*	.12*	-.06	-.10+	-.12*	.14*	.19*	-.10+	-.15*	-.04
20 LOC if cond. contributor	-.18+	.19+	-.12	-.05	.25*	-.02	.01	-.16	-.08	.23*	.16	.08	.05	-.00	.27*	—	—	—

Note: Where applicable, Cronbach's α reported in parentheses on the diagonal. Abbreviation: LOC = level of contribution.
+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

riders in the English treatment as compared to the Dutch treatment. In the conditional setting, English decreases the share of conditional contributors from 43 to 37%; in the unconditional contribution setting, English decreases the share of positive contributors from 52 to 44%. When focusing on those with below-average conscientiousness, the effects get—as expected—much stronger: In the conditional setting, English decreases the share of conditional contributors from 50 to 27%; in the unconditional contribution setting, the share of positive contributors decreases from 58 to 37%. Using two-sided tests of proportions, only these latter two differences are statistically significant ($p < 0.05$). Note that even a small or medium variation in the share of free riders versus conditional contributors (or positive contributors) can destabilize an otherwise successful group or population (Ostrom, 2000).

To more thoroughly investigate the foreign language effect, we employ logistic regression analyses to test the extent to which the language treatment affects participants' basic behavioral pattern when contributing to the public good. Regression analyses allow us to statistically control for differences in samples in the control and treatment group, for example, personality-related differences between Dutch and English treatments, when randomization did not work out perfectly. Table 3 reports estimations for both the conditional (model C1) and the unconditional (model U1) settings including only control variables. Although not statistically significant in the unconditional contributing setting, females and those who are open to experience tend to contribute to the public good (rather than free ride), and thus, display more prosocial behavior.

Across both the conditional (model C1) and the unconditional (model U1) settings, we find that individuals who know more classmates are less likely to contribute to the public good. At first glance, this is a somewhat counterintuitive result. Yet, the dual-process framework employed in this study suggests a tentative explanation: When students have fewer acquaintances in a class, they know much less about the others. Due to this lack of information, deliberate Type 2 processes cannot provide sufficient guidance. Consequently, individuals might rely more on intuitive Type 1 processing (Evans & Stanovich, 2013). Type 1 processing, as suggested throughout this study, typically triggers more cooperative behavior than Type 2 processing, which might thus explain the observed effect.

When adding the language treatment to the estimations (models C2 and U2), we find that in foreign language (English) treatments, and for both the conditional and the unconditional contribution settings, students are less likely to contribute to the public good. We also expected that the language treatment would affect participants' basic and primary decisions of whether to contribute at all to the public good and reciprocate others' contributions more than their specific levels of contribution (conditional upon contributing and reciprocating at all; the secondary decision). Table 4 reports OLS estimations of the language effect for these secondary decisions after participants decided to positively contribute or to positively reciprocate contributions of other group members. In our estimations, we acknowledge that for conditional cooperation language might not only affect the overall level of contributions, but also the degree to which an increase in other group members' contribution(s) is reciprocated by an increase in ones' own contributions. Thus, we include an interaction of the language treatment with the other group members' average contribution. To reduce correlations between other group members' average contribution (OAC) and related interactions, we center and rescale this variable with -1 indicating that others do not contribute anything and $+1$ indicating that these others contribute the maxim possible amount. Overall, we observe (in Table 4) that language does not affect behavior once participants have decided not to free ride.[4] This observation applies to both the positive contribution in the unconditional contribution setting and the positive reciprocation (as a conditional contributor) in the conditional contribution settings. The related effects are not statistically significant. In sum, we find support for Hypothesis 1, which states that foreign language use affects the initial decision about positively contributing or reciprocating, but does not affect the specific level of contribution.

Adding the interaction of the language treatment with conscientiousness as proxy for an individual's predisposition to engage in deliberate thinking, we find that the English language effect is less negative for highly conscientious individuals and more

---

[4] Note for behavior in the conditional cooperation setting, this analysis focuses on those classified as conditional contributors. Due to the construction of this group, the variable "others' average contribution" has a substantial influence on the group members' level of contribution. That is the reason for its substantial effect as well as the rather high explained variance (R^2) of the overall model. Excluding this variable does not change our results; despite the explained variance drops to about 7%, remaining coefficients remain rather equal and, particularly, the estimated language effect and its associated standard errors remain constant.

TABLE 3
Effects of Language on Basic Behavioral Patterns

Setting	Conditional contribution			Unconditional contribution		
(Dependent variable)	(Conditional contributor vs. free rider)			(Positive contributor vs. free rider)		
Model	C1	C2	C3	U1	U2	U3
Constant	1.68 (2.80)	2.03 (2.83)	1.56 (2.89)	3.12 (2.58)	3.45 (2.60)	3.27 (2.62)
Gender (female)	0.76 (0.36)*	0.80 (0.36)*	0.86 (0.37)*	0.50 (0.33)	0.54 (0.33)	0.55 (0.33)
Age	-0.12 (0.14)	-0.12 (0.14)	-0.11 (0.14)	-0.17 (0.13)	-0.17 (0.13)	-0.17 (0.13)
Age when learning English	0.05 (0.07)	0.05 (0.07)	0.06 (0.07)	-0.01 (0.06)	-0.00 (0.06)	0.00 (0.06)
English proficiency	-0.02 (0.13)	-0.05 (0.13)	-0.04 (0.14)	0.05 (0.12)	0.03 (0.12)	0.04 (0.12)
Lived in English-speak. ctr.	-0.21 (0.64)	-0.11 (0.65)	-0.13 (0.67)	0.34 (0.58)	0.43 (0.59)	0.43 (0.60)
Number of classmates known	-0.03 (0.01)+	-0.03 (0.01)+	-0.02 (0.01)	-0.02 (0.01)*	-0.02 (0.01)+	-0.02 (0.01)+
Honesty-Humility	0.00 (0.15)	0.01 (0.15)	-0.00 (0.15)	0.22 (0.14)	0.24 (0.14)+	0.25 (0.14)+
Emotionality	0.13 (0.18)	0.12 (0.18)	0.10 (0.18)	0.14 (0.16)	0.13 (0.16)	0.11 (0.16)
Extraversion	-0.10 (0.15)	-0.15 (0.16)	-0.13 (0.16)	0.11 (0.13)	0.08 (0.14)	0.08 (0.14)
Agreeableness	0.17 (0.14)	0.20 (0.14)	0.20 (0.15)	0.09 (0.13)	0.11 (0.13)	0.10 (0.13)
Openness to experience	0.25 (0.15)+	0.35 (0.16)*	0.35 (0.16)*	0.14 (0.13)	0.20 (0.14)	0.20 (0.14)
Conscientiousness (CS)	-0.12 (0.15)	-0.11 (0.15)	-0.36 (0.19)+	-0.18 (0.13)	-0.18 (0.14)	-0.31 (0.18)+
English treatment		-0.63 (0.30)*	-0.65 (0.30)*		-0.53 (0.27)*	-0.53 (0.27)*
English treatment × CS			0.62 (0.29)*			0.33 (0.26)
Log likelihood (χ^2)	-155.7 (24.04)*	-153.5 (28.55)**	-151.1 (33.24)**	-181.5 (19.40)+	-179.5 (23.38)*	-178.7 (24.97)*
Pseudo-R^2	0.071	0.085	0.099	0.051	0.061	0.065
Observations	249	249	249	276	276	276

Note: Logistic regression analyses. Robust standard errors in parentheses.
+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 4
Effects of Language on the Specific Instantiation of Basic Behavioral Patterns (Level of Contribution)

Setting (Dependent variable) Model	Conditional contribution (Level of contribution)						Unconditional contribution (Level of contribution)			
	C4		C5		C6		U4		U5	
Constant	-0.77	(7.27)	-0.54	(7.32)	-0.54	(7.32)	16.19	(10.73)	17.00	(10.77)
Gender (female)	-1.04	(0.66)	-1.04	(0.66)	-1.04	(0.66)	-1.58	(1.11)	-1.44	(1.13)
Age	0.82	(0.37)*	0.83	(0.38)*	0.83	(0.38)*	-0.39	(0.51)	-0.41	(0.51)
Age when learning English	-0.28	(0.15)+	-0.28	(0.15)+	-0.28	(0.15)+	0.19	(0.20)	0.19	(0.20)
English proficiency	-0.65	(0.23)**	-0.67	(0.24)**	-0.67	(0.24)**	0.08	(0.41)	0.06	(0.41)
Lived in English-speaking country	3.79	(1.19)**	3.80	(1.20)**	3.80	(1.20)**	1.17	(1.81)	1.19	(1.81)
Number of class mates known	0.02	(0.04)	0.01	(0.04)	0.01	(0.04)	0.04	(0.05)	0.04	(0.05)
Honesty-Humility	-0.17	(0.33)	-0.18	(0.34)	-0.18	(0.34)	0.12	(0.48)	0.12	(0.48)
Emotionality	-0.62	(0.48)	-0.63	(0.49)	-0.63	(0.49)	-0.23	(0.56)	-0.26	(0.57)
Extraversion	-0.50	(0.41)	-0.52	(0.41)	-0.52	(0.41)	-0.81	(0.48)+	-0.82	(0.48)+
Agreeableness	0.34	(0.31)	0.36	(0.31)	0.36	(0.31)	0.14	(0.43)	0.13	(0.43)
Openness to experience	0.56	(0.30)+	0.63	(0.33)+	0.63	(0.33)+	0.40	(0.45)	0.47	(0.46)
Conscientiousness	0.78	(0.34)*	0.84	(0.37)*	0.84	(0.37)*	0.27	(0.47)	0.31	(0.47)
Others' average contrib. (OAC)	8.49	(0.28)***	8.49	(0.28)***	8.52	(0.38)***				
English treatment			-0.53	(0.62)	-0.53	(0.62)			-0.81	(0.90)
English treatment × OAC					-0.07	(0.56)				
R^2 (F)	0.675	(144.8)***	0.676	(141.0)***	0.676	(135.1)***	0.074	(0.80)	0.080	(0.80)
Observations (subjects)	4100	(100)	4100	(100)	4100	(100)	134	(134)	134	(134)

Note: Ordinary least square regression analyses. Robust standard errors in parentheses (clustered at the level of subjects).
$^+ p < 0.1$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$

negative for students who score low on conscientiousness (see Model C3 and U3 in Table 3). To better illustrate these effects, we consider two meaningful levels of observed conscientiousness: the mean plus one standard deviation and the mean minus one standard deviation as high and low levels, respectively. Concerning the decision about whether to contribute, the language effect for the conditional contribution setting is virtually absent for highly conscientious individuals ($\beta = -0.03$, $SE = 0.41$, $p = 0.940$), but is statistically highly significant for individuals who score low on conscientiousness ($\beta = -1.27$, $SE = 0.44$, $p = 0.003$). Although the interaction between language treatment and conscientiousness is statistically not significant for the unconditional contribution setting, it shows a similar pattern: The language effect is very low and not statistically significant for those scoring high on conscientiousness ($\beta = -0.21$, $SE = 0.37$, $p = 0.74$), but statistically significant for those scoring low on conscientiousness ($\beta = -0.86$, $SE = 0.38$, $p = 0.023$). Thus, individuals' decisions about whether to contribute to the public good are not only affected by the foreign language, but also by their individual

predisposition to engage in deliberate thinking; the effect is stronger for individuals who score low on conscientiousness and smaller as well as indistinguishable for those who score high on conscientiousness. Figure 2 illustrates these findings by plotting the probability of being a conditional contributor vis-á-vis a free rider in the conditional contribution setting and a positive contributor vis-á-vis a free rider in the unconditional contribution setting. The plots provide these probabilities for each language treatment and for low and high levels of conscientiousness. One clearly sees that the effect of language is about 20% or more for people low in conscientiousness, which speaks to the practically meaningful strength of the effect. Thus, our data and statistical tests support Hypothesis 2.

We further explore the data to address an additional question. If both foreign language use and an individual's disposition to engage in deliberate thinking are alternative routes to deliberate thinking, then the effect of either of these two should be smaller if the other had already triggered a more deliberate thinking process. This implies that not only should the foreign language effect be smaller
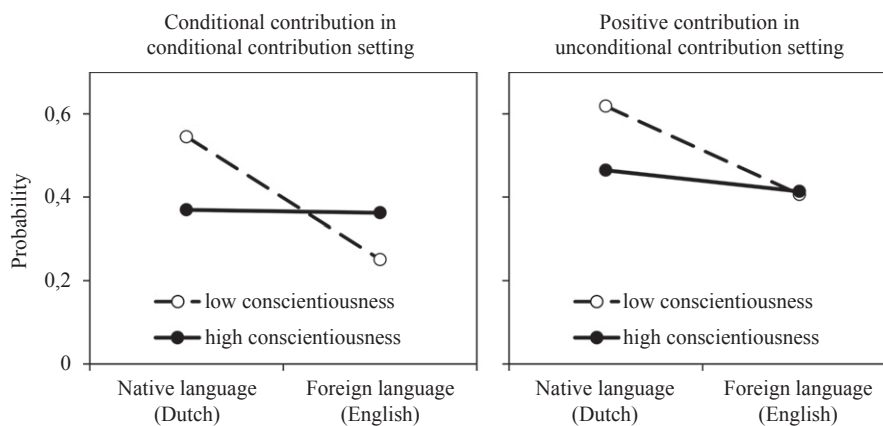
FIGURE 2

Interactive Effect of Language Use on Probabilities of Conditionally Contributing (Conditional Contribution Setting) and Positively Contributing (Unconditional Contribution Setting)

for individuals who are predisposed to a more deliberate thinking, but also that the effect of this predisposition should be smaller in a foreign language context. In the latter case, even individuals who are less disposed to deliberate thinking are more likely to engage in deliberate thinking. Considering our data, it seems that the conscientiousness effect is indeed, on average, stronger in the native language treatment (Dutch) than in the foreign language treatment (English). Calculating the effect for conscientiousness in native (Dutch) treatments (unconditional contribution setting: $\beta = -0.38$, $SE = 0.19$, $p = 0.063$; conditional contribution setting: $\beta = -0.31$, $SE = 0.18$, $p = 0.075$), we find statistically significant and—in terms of magnitude—larger effects than in the English treatments (unconditional contribution setting: $\beta = 0.26$, $SE = 0.23$, $p = 0.258$; conditional contribution setting: $\beta = 0.01$, $SE = 0.20$, $p = 0.942$). These results suggest that students' disposition to deliberate thinking, approximated with their conscientiousness, affects their contribution behavior more strongly in native (Dutch) language settings. While not hypothesized, this finding also lends support to the dual-process account of the related foreign language effect.

DISCUSSION

This study aimed at testing and identifying the causal effect of foreign language use on prosocial versus free-riding behavior within classroom settings. We thereby focus on one particular facet of the multicultural learning environment, that is, the foreign language use. In keeping with recent studies,

our results provide further support that using a foreign language triggers a more deliberate decision mode due to reduced emotional responses and less pronounced decision-making biases (cf. Keysar et al., 2012; Costa at el., 2014). We demonstrate that a foreign language context (here, English) elicits more free riding and less prosocial behavior in a social dilemma context; that is, individuals are less inclined to contribute something to a public good and, further, they do not positively reciprocate others' contributions to a public good. In addition to situational influences such as language, a student's behavior and resulting group dynamics might also be driven by individual differences. Accounting for students' personalities, we find that the language effect may override students' predispositions with respect to types of thinking: Foreign language use might induce students with a low disposition to think deliberately (i.e., who are not very conscientious) to switch to a more deliberate mode of thinking. Observing this moderating effect further supports the dual-process account for explaining the foreign language effect. Through identifying additional moderating or mediating effects for the foreign language effect, for example, perceptions of interpersonal closeness as a potential mediator (cf. Cornelissen et al., 2011), or positive and negative emotional reactions to the language context itself (Dewaele & MacIntyre, 2014; Dewaele, Petrides, & Furnham, 2008), future research might further enhance our understanding of the underlying processes creating the observed language effect.

Building on Costa and colleagues' (2014) argument that the language effect is contingent on the

presentation and structure of a decision, our results indicate the benefit of modeling the decision-making procedure in a public goods context as a 2-step process: (1) *whether,* and if yes, (2) *how much* to contribute. In the first step, students choose a fundamental behavioral pattern, and hence whether to free ride or to positively contribute, respectively, reciprocate others' contributions. This first step is highly susceptible to the influence of a (foreign) language context. The second step of fixing a specific level of contribution requires a balance between the pros and cons of contributing more or less to public goods and triggers more deliberate thinking (Type 2 processing). That is, independent of the language, participants already engage in a more deliberate type of processing. Consequently, we find a strong language effect in the first, but not the second, step.

Our results have implications for the business school classroom environment given the worldwide demand to offer more classes in English. In fact, our findings suggest that if the increased emphasis on groups and teams across organizational behavior syllabi (Brown et al., 2013), group projects (Ferrante et al., 2006), and collaborative and student-centered learning (Brooks & Ammons, 2003) is accompanied by the introduction or use of English as foreign language, this linguistic element may potentially counteract at least partly the desired effects on formation of cooperation skills on the part of nonnative speakers. Below, we discuss some of the practical implications for business schools that stem from our findings.

Just as corporations require a language strategy (Neeley, 2013), business schools should also consider the ramifications of English as a global language for their activities and for students' behaviors. Students may contribute less to the public good and hence their study groups, depending on the number of people not speaking English as their native language; thereby aggravating the free-rider problem discussed by Brooks and Ammons (2003). Although one could recommend that instructors seek to mitigate these tendencies, one could also argue that these experiences should become an integral part of training, reflection, and preparation for working in a global business environment. More specifically, we suggest expanding our understanding of cross-cultural competence and cultural intelligence by raising the awareness on how foreign language use can affect judgment and decision-making processes. Cultural intelligence is "an outsider's seemingly natural ability to interpret someone's unfamiliar and ambiguous gestures the way that [this] person's compatriots would" (Earley & Mosakowski, 2004: 3) and is a key part of cross-cultural competence in international business (Johnson, Lenartowicz, & Apud, 2006). Education related to cultural intelligence and cross-cultural competence focuses on conscious changes in behavior that enable someone to adapt toward individuals in another culture (Egan & Bendick, 2008; Earley & Peterson, 2004). Complementing these deliberate adaptation processes, our study and related work on the decision-making in foreign language contexts (e.g., Keysar et al., 2012, Costa et al., 2014; Volk, Köhler, & Pudelko, 2014) clearly point at unintended and unconscious changes in behavior once people are exposed to such contexts. We suggest that students who are cross-culturally competent should develop ways to ensure consistent behavior across linguistically and culturally diverse situations. Subconscious processes render this behavior inconsistent across contexts, and may lead to potential conflict and lack of efficient global coordination. Thus, attention for the metacognitive facet within a cultural intelligence training (Earley & Peterson, 2004) should not only include metacognition related to people in the target culture, but should also cover experiencing and reflecting on a foreign language context. As the language effect is robust but also subtle and difficult to imagine, we advocate for classroom simulations that focus on such language effects as an important supplementary tool for cultural intelligence training. Such tools may also contribute well to the "being-element"—that is, self-awareness and value-based learning—of MBA programs (cf. Brown et al., 2013) and especially those focusing on international business. This implication is consistent with earlier work, which indicates that well-implemented public goods experiments in the classroom can help students learn how to achieve socially optimal outcomes (Marks, Lehr, & Brastow, 2006). A caveat to this suggestion is, however, that recruiters may not pay attention to such behavioral course elements (Rynes, Trank, Lawson, & Ilies, 2003).

Finally, although our study is not directly related to teams in a business environment, our results contribute to the broader context of research on the impact of foreign language use and, in particular, resulting language barriers, on multinational teams in general (Hinds, Neeley, & Cramton, 2014) and, more specifically, on trust formation in multinational teams, which is one basis for effective cooperation (Tenzer et al., 2014). Tenzer and colleagues

(2014) and Hinds and colleagues (2014) showed that language diversity and language asymmetries in multinational teams may create fault lines which, in turn, may adversely impact trust formation (Tenzer et al., 2014). To the extent that our results for a culturally and linguistically homogeneous student sample in the public goods game could be replicated in a "true" work group setting, they would suggest that even beyond language barriers created by a team's linguistic diversity (Tenzer et al. 2014; Hinds et al., 2014), the use of a foreign language can change people's thinking, which eventually changes the cooperative behavior even among linguistically homogeneous subgroups. As such, our work contributes to the development of conceptual foundations of multilingual work teams.[5]

We also acknowledge four limitations of our study, which suggest directions for future research. First, we only include English as foreign and Dutch as native language. While English is the most common foreign language used in business degree programs around the world, future research could examine other frequently used languages that are important in international business, such as Spanish and any of the languages from the Chinese language family (e.g., Mandarin). While suggesting that individuals' behaviors change due to falling back on or deviating from more intuitive and heuristic types of thinking, the heuristics that our participants employ could possibly be specific to their Dutch cultural background. In addition, using the English language might not only change the type of thinking, but also—due to its association with the Anglo-Saxon culture—change the salience of different heuristics, values, or norms. In this case, our experiment might be simultaneously affected by two cultures, albeit embodied in different ways: Dutch with Dutch students being embedded in the Dutch culture and English with the English language which students are required to speak in the classroom and with which certain norms and values are associated. Replicating the experiment with other

cultures and even multiple cultural backgrounds would further advance our understanding of the language effects.

Second, to identify the *causal* effect of foreign language use, we had to avoid associated covariations of any possibly confounding factor, such as group composition, that is, with respect to group members' cultural or national background. If we vary the group composition along with the language use, then we are not able to unambiguously identify the causal effect of language. Also varying the language among groups composed of people speaking different native languages would not only vary the foreign language use, but also the sort of people speaking their foreign or native language. Because our focus is on the causal effect of foreign language use, we therefore employ a sample that is homogeneous with respect to the native language. Future research could expand on our findings by further studying if the identified language effect might be moderated by group composition.

Third, our study only includes one round of cooperation without rich communication between group members. Focusing on individuals' decisions improves the identification of the effect under consideration and supports a causal interpretation of the experimentally identified foreign language effect. Through incorporating settings related to conditional cooperation, we address issues relevant in games with multiple rounds, but still remain focused on individuals' decisions without introducing a noisy "real interaction" element. Yet, future research could examine whether similar effects show up when groups are involved in intensive interaction over time.

Fourth, following prior research such as that of Keysar and colleagues (2012) and Costa and colleagues (2014), we focus on settings where people have sufficient time and a complete understanding of the rules of the game. Consequently, the foreign language is unlikely to create confusion or misunderstanding, and cognitive load is likely to not restrict deliberate Type 2 processes. In contrast, if a student lacks basic language proficiency, his or her cognitive load may be exceeded (cf. Volk et al., 2014; Takano & Noda, 1993), and thus, he or she may fall back on intuitive Type 1 processing rather than more deliberate thinking (Thompson, 2009). In this case of language-induced confusion, more intuitive Type 1 processing would likely lead to more prosocial and less free-riding behavior. The fragile balance between Type 1 and Type 2 processing should be examined further.

Before concluding, we highlight several other promising directions for future research. First, because

---

[5] Although this study focuses on groups within a classroom, and we tentatively extrapolate to work teams, our study might also have implications for studying behavior in hotspots of migration and "super-diverse" niches with extreme linguistic diversity. The extreme linguistic diversity generates complex multilingual repertoires in which often several (fragments of) "migrant" languages and *lingua francas* are combined (Blommaert, 2010). Although group dynamics, language barriers, and fault lines, as well as language-based power dynamics will be of extreme relevance in explaining dynamics in such super-diverse niches, the way thinking changes when confronted with foreign languages may add another small part to the picture.

our study has illustrated the importance of examining steps independently, we encourage other researchers to consider even seemingly simple decisions as multistep processes where each step can be affected differently by exposure to a foreign language. This could be especially promising when investigating language effects in more realistic contexts characterized by more complex decisions.

Second, although our study focuses on the effect of foreign language on the type of thinking, it can have additional effects on individuals. In particular, three effects that have received some attention in the language-related management literature are linguistic relativity, cultural accommodation, and cross-cultural code-switching. *Linguistic relativity* is "the idea that culture, through language, affects the way we think, especially perhaps our classification of the experienced world" (Gumperz & Levinson, 1996: 1). Individuals' perceptions, values, and resulting behaviors are influenced by differences in classifications that may create different foci through which language eventually shapes behavior (Carroll, 1956; Gilbert, Regier, Kay, & Ivry, 2008). For instance, a recent study by Santacreu-Vasut, Shenkar, and Shoham (2014) revealed that language-based gender distinctions within languages' grammatical structures significantly impact women's corporate presence on firms' boards, in multinational enterprises' subsidiary boards, and in leadership positions. Independent of the initial association of culture and language, linguistic relativity and coevolution both illustrate that whether the association is perfect, imperfect, strong, or weak, "incidental acculturation" may play a role in further stabilizing this association (Yang & Bond, 1980). That is, while learning a language, individuals are exposed to the culture related to the corresponding language, and thereby develop a link between this language and culture (Ralston, Cunniff, & Gustafson, 1995). When exposed to the language, individuals' values and norms associated with this language tend to be more salient. Thus individuals may subconsciously adapt toward the culture associated with the foreign language—a phenomenon known as cultural accommodation.[6] Consistent with this view, Akkermans and colleagues (2010) report that the

effect of using English—independent of a person's level of foreign language proficiency—becomes even stronger the greater the length of exposure to and interaction with the corresponding Anglo-Saxon culture (e.g., by having lived in an Anglo-Saxon country). That is, any language effects arising from linguistic relativity and cultural accommodation should yield distinct results depending on the (pair of) languages under consideration. In turn, the effect based on switching thinking types examined in the present study is argued to be independent of the specific foreign language (Costa et al., 2014). To further disentangle the effect investigated here from linguistic relativity and cultural accommodation, future studies should vary the foreign language.

A third set of promising research avenues extends beyond such subconscious processes, as individuals may also consciously and purposefully modify their behavior in a foreign setting to accommodate different cultural norms for appropriate behavior, an act referred to as cross-cultural code-switching (e.g., Molinsky, 2007; Milroy & Muysken, 1995). Building on this research and on our findings related to shifts from less to more deliberate thinking, we might expect that individuals who engage in such deliberate code-switching are—by definition—more deliberate and, consequently, less inclined to contribute to public goods or to cooperate in other manners. This tendency, however, might overlap with the intentions to adapt toward the target culture, which could be to adopt behavior that is more cooperative (e.g., in case of strongly collectivist cultures). The overall effect will likely be a "negotiated" balance between the two effects. Because our study included only students operating in a native environment who are approached in a different language, we were not able to observe conscious code-switching. Future research could enrich the experimental setting to actually consider such code-switching. Here it might be especially interesting to study the impact of professors' code-switching on students' learning.

CONCLUSION

Our research has examined the impact of foreign language on students' willingness to contribute to a collective effort. We find that students are more inclined to free ride in a foreign language setting than in a native language setting; however, conditional upon making any contribution at all, the actual level of this contribution is not affected. Furthermore, we find that a student's predisposition toward

---

[6] Further complications arise from recent arguments suggesting the norms and values associated with a language, such as English, are more and more a question of whose English it is and where it is spoken; that is, the meanings associated with a global language may become highly localized (Blommaert, 2010).

deliberate thinking modes, with the personality trait conscientiousness as a proxy, attenuates this relationship. We hope that this study enriches our understanding of the individual-level processes underlying social dynamics in foreign language settings and helps other researchers to further develop related theories.

REFERENCES

Agar, M. 1993. *Language shock: Understanding the culture of conversation*. New York: William Morrow.

Akkermans, D., Harzing, A. W., & van Witteloostuijn, A. 2010. Cultural accommodation and language priming: Competitive versus cooperative behavior in a prisoner's dilemma game. *Management International Review*, 50: 559–584.

Alter, A. L., Oppenheimer, D. M., Epley, N., & Eyre, R. N. 2007. Overcoming intuition: Metacognitive difficulty activates analytic reasoning. *Journal of Experimental Psychology. General*, 136(4): 569–576.

Ashton, M. C., & Lee, K. 2007. Empirical, theoretical, and practical advantages of the HEXACO model of personality structure. *Personality and Social Psychology Review*, 11: 150–166.

Ashton, M. C., & Lee, K. 2009. The HEXACO-60: A short measure of the major dimensions of personality. *Journal of Personality Assessment*, 91: 340–345.

Blommaert, J. 2010. *The sociolinguistics of globalization*. Cambridge, England: Cambridge University Press.

Brandts, J., & Charness, G. 2011. The strategy versus the direct-response method: A first survey of experimental comparisons. *Experimental Economics*, 14(3): 375–398.

Brannen, M. Y., Piekkari, R., & Tietze, S. 2014. The multifaceted role of language in international business: Unpacking the forms, functions and features of a critical challenge to MNC theory and performance. *Journal of International Business Studies*, 45: 495–507.

Brooks, C. M., & Ammons, J. L. 2003. Free riding in group projects and the effect of timing, frequency, and specificity of criteria in peer assessments. *Journal of Education for Business*, 78: 268–272.

Brown, K. G., Rynes, S. L., Charlier, S. D., & Hosmanek, A. 2013. What do we teach in organizational behavior? An analysis of MBA syllabi. *Journal of Management Education*, 37: 447–471.

Cadsby, C. B., & Maynes, E. 1998. Gender and free riding in a threshold public goods game: Experimental evidence. *Journal of Economic Behavior & Organization*, 34(4): 603–620.

Cappelletti, D., Güth, W., & Ploner, M. 2011. Being of two minds: Ultimatum offers under cognitive constraints. *Journal of Economic Psychology*, 32: 940–950.

Carroll, J. B. 1956. *Language, thought and reality: Selected writings of Benjamin Lee Whorf*. Cambridge, MA: MIT Press.

Chen, S., & Chaiken, S. 1999. The heuristic-systematic model in its broader context. In S. Chaiken, & Y. Trope (Eds.), *Dual-process theories in social psychology*: 73–96. New York: Guilford Press.

Cornelissen, G., Dewitte, S., & Warlop, L. 2011. Are social value orientations expressed automatically? Decision making in the dictator game. *Personality and Social Psychology Bulletin*, 37: 1080–1090.

Costa, A., Fourcart, A., Hayakawa, S., Aparici, M., Apesteguia, J., Heafner, J., & Keysar, B. 2014. Your morals depend on language. *PLoS One*, 9(4): e94842.

Cox, T. H., Lobel, S. A., & McLeod, P. L. 1991. Effects of ethnic group cultural differences on cooperative and competitive behavior on a group task. *Academy of Management Journal*, 34: 827–847.

Dewaele, J.-M., & MacIntyre, P. D. 2014. The two faces of Janus? Anxiety and enjoyment in the foreign language classroom. *Studies in Second Language Learning and Teaching*, 4(2): 237–274.

Dewaele, J.-M., Petrides, K. V., & Furnham, A. 2008. The effects of trait emotional intelligence and sociobiographical variables on communicative anxiety and foreign language anxiety among adult multilinguals. *Language Learning*, 58(4): 911–960.

Dewaele, J.-M., & Shan Ip, T. 2013. The link between foreign language classroom anxiety, second language tolerance of ambiguity and self-rated English proficiency among Chinese learners. *Studies in Second Language Learning and Teaching*, 3(1): 47–66.

Earley, P. C., & Mosakowski, E. 2004. Cultural intelligence. *Harvard Business Review*, 82(10): 139–146.

Earley, P. C., & Peterson, R. S. 2004. The elusive cultural chameleon: Cultural intelligence as a new approach to intercultural training for the global manager. *Academy of Management Learning & Education*, 3(1): 100–115.

Egan, M. L., & Bendick, M., Jr. 2008. Combining multicultural management and diversity into one course on cultural competence. *Academy of Management Learning & Education*, 7(3): 387–393.

Eisenberg, N., Fabes, R. A., & Spinrad, T. L. 2007. Prosocial development. In N. Eisenberg (Ed.), *Handbook of child psychology, vol. 3: social, emotional, and personality development*: 646–718. Hoboken, NJ: John Wiley and Sons.

Evans, J. St. B. T. 1989. *Bias in human reasoning: Causes and consequences*. Brighton, England: Erlbaum.

Evans, J. St. B. T. 2007. On the resolution of conflict in dual process theories of reasoning. *Thinking & Reasoning*, 13: 321–329.

Evans, J. St. B. T. 2008. Dual-processing accounts of reasoning, judgment, and social cognition. *Annual Review of Psychology*, 59: 255–278.

Evans, J. St. B. T., & Frankish, K. 2009. *In two minds: Dual - processes and beyond*. Oxford, England: Oxford University Press.

Evans, J. St. B. T., & Stanovich, K. E. 2013. Dual-process theories of higher cognition: Advancing the debate. *Perspectives on Psychological Science*, 8(3): 223–241.

Ferrante, C. J., Green, S. G., & Forster, W. R. 2006. Getting more out of team projects: Incentivizing leadership to enhance performance. *Journal of Management Education*, 30(6): 788–797.

Fischbacher, U., Gächter, S., & Fehr, E. 2001. Are people conditionally cooperative? Evidence from a public goods experiment. *Economics Letters*, 71(3): 397–404.

Fischbacher, U., Gächter, S., & Quercia, S. 2012. The behavioral validity of the strategy method in public good experiments. *Journal of Economic Psychology*, 33(4): 897–913.

Gächter, S. 2007. Conditional cooperation: Behavioral regularities from the lab and the field and their policy implications. In B. S. Frey & A. Stutzer (Eds.), *Economics and psychology. A promising new cross-disciplinary field*: 19–50. Cambridge: The MIT Press.

Gilbert, A. L., Regier, T., Kay, P., & Ivry, R. B. 2008. Support for lateralization of the Whorf effect beyond the realm of color discrimination. *Brain and Language*, 105: 91–98.

Gumperz, J. J., & Levinson, S. C. 1996. Introduction: Linguistic relativity re-examined. In J. J. Gumperz, & S. C. Levinson (Eds.), *Rethinking linguistic relativity*: 1–20. Cambridge: Cambridge University Press.

Hermann, B., & Thöni, C. 2009. Measuring conditional cooperation: A replication study in Russia. *Experimental Economics*, 12: 87–92.

Hinds, P. J., Neeley, T. B., & Cramton, C. D. 2014. Language as a lightning rod: Power contests, emotion regulation, and subgroup dynamics in global teams. *Journal of International Business Studies*, 45: 536–561.

Johnson, J. P., Lenartowicz, T., & Apud, S. 2006. Cross-cultural competence in international business: Toward a definition and a model. *Journal of International Business Studies*, 37(4): 525–543.

Karlan, D., & List, J. A. 2007. Does price matter in charitable giving? Evidence from a large-scale natural field experiment. *American Economic Review*, 97(5): 1774–1793.

Keysar, B., Hayakawa, S. L., & An, S. G. 2012. The foreign-language effect: Thinking in a foreign tongue reduces decision biases. *Psychological Science*, 23(6): 661–668.

Kocher, M. G., Cherry, T., Kroll, S., Netzer, R. J., & Sutter, M. 2008. Conditional cooperation on three continents. *Economics Letters*, 101(3): 175–178.

Lee, K., & Ashton, M. C. 2004. Psychometric properties of the HEXACO personality inventory. *Multivariate Behavioral Research*, 39: 329–358.

Marks, M., Lehr, D., & Brastow, R. 2006. Cooperation versus free riding in a threshold public goods classroom experiment. *The Journal of Economic Education*, 37(2): 156–170.

McCrae, R. R., & John, O. P. 1992. An introduction to the five-factor model and its applications. *Journal of Personality*, 60(2): 175–215.

Mintzberg, H., & Gosling, J. 2002. Educating managers beyond borders. *Academy of Management Learning & Education*, 1(1): 64–76.

Molinsky, A. 2007. Cross-cultural code-switching: The psychological challenges of adapting behavior in foreign cultural interactions. *Academy of Management Review*, 32(2): 622–640.

Milroy, L., & Muysken, P. 1995. *One speaker, two languages. Cross-disciplinary perspectives on code-switching*. Cambridge: Cambridge University Press.

Neeley, T. B. 2013. Language matters: Status loss and achieved status distinctions in global organizations. *Organization Science*, 24(2): 476–497.

Ostrom, E. 2000. Collective action and the evolution of social norms. *The Journal of Economic Perspectives*, 14(3): 137–158.

Palfrey, T. R., & Prisbrey, J. E. 1997. Anomalous behavior in public goods experiments: How much and why? *The American Economic Review*, 87: 829–846.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. 2003. Common method bias in behavioral research: A critical review of the literature and recommended remedies. *The Journal of Applied Psychology*, 88: 879–903.

Ralston, D. A., Cunniff, M. K., & Gustafson, D. J. 1995. Cultural accommodation: The effect of language on the responses of bilingual Hong Kong Chinese managers. *Journal of Cross-Cultural Psychology*, 26: 714–727.

Rand, D. G., Greene, J. D., & Nowak, M. A. 2012. Spontaneous giving and calculated greed. *Nature*, 489: 427–430.

Rand, D. G., Peysakhovich, A., Kraft-Todd, G. T., Newman, G. E., Wurzbacher, O., Nowak, M. A., & Greene, J. D. 2014. Social heuristics shape intuitive cooperation. *Nature Communications*, 5: 3677.

Rynes, S. L., Trank, C. Q., Lawson, A. M., & Ilies, R. 2003. Behavioral coursework in business education: Growing evidence of a legitimacy crisis. *Academy of Management Learning & Education*, 2(3): 269–283.

Santacreu-Vasut, E., Shenkar, O., & Shoham, A. 2014. Linguistic gender marking and its international business ramifications. *Journal of International Business Studies*, 45: 1170–1178.

Schulz, J. F., Fischbacher, U., Thöni, C., & Utikal, V. 2014. Affect and fairness: Dictator games under cognitive load. *Journal of Economic Psychology*, 41: 77–87.

Selten, R. 1967. *Strategiemethode zur Erforschung des eingeschränkt rationalen Verhaltens im Rahmen eines Oligopolexperiments, Beiträge zur experimentellen Wirtschaftsforschung, J.C.B*. Tübingen: Mohr.

Sloman, S. A. 1996. The empirical case for two systems of reasoning. *Psychological Bulletin*, 119: 3–22.

Stanovich, K. E. 1999. *Who is rational? Studies of individual differences in reasoning*. Mahwah, NJ: Erlbaum.

Stanovich, K. E. 2009. Distinguishing the reflective, algorithmic and autonomous minds: Is it time for a tri-process theory? In J. St. B. T. Evans & K. Frankish (Eds.), *In two minds: Dual processes and beyond*: 55–88. Oxford, England: Oxford University Press.

Starmer, C., & Sugden, R. 1991. Does the random-lottery incentive system elicit true preferences? An experimental investigation. *The American Economic Review*, 81(4): 971–978.

Takano, Y., & Noda, A. 1993. A temporary decline of thinking ability during foreign language processing. *Journal of Cross-Cultural Psychology*, 24: 445–462.

Tenzer, H., Pudelko, M., & Harzing, A. W. 2014. The impact of language barriers on trust formation in multinational teams. *Journal of International Business Studies*, 45(5): 508–535.

Thompson, V. A. 2009. Dual-process theories: A metacognitive perspective. In J. St. B. T Evans & K. Frankish, (Eds.), *In two*

minds: Dual processes and beyond: 171–196. Oxford, England: Oxford University Press.

Tietze, S., & Dick, P. 2013. The victorious English language: Hegemonic practices in the management academy. *Journal of Management Inquiry*, 22(1): 122–134.

Tinghög, G., Andersson, D., Bonn, C., Böttiger, H., Josephson, C., Lundgren, G., Västfjäll, D., Kirchler, M., & Johannesson, M. 2013. Intuition and cooperation reconsidered. *Nature*, 498: E1–E2.

Verkoeijen, P. P. J. L., & Bouwmeester, S. 2014. Does intuition cause cooperation? *PLoS One*, 9: e96654, 10.1371/journal. pone.0096654.

Volk, S., Köhler, T., & Pudelko, M. 2014. Brain drain: The cognitive neuroscience of foreign language processing in multinational corporations. *Journal of International Business Studies*, 45: 862–885.

Yang, K. S., & Bond, M. H. 1980. Ethnic affirmation by Chinese bilinguals. *Journal of Cross-Cultural Psychology*, 11: 411–425.

Diemo Urbig is an assistant professor at the Jackstädt Center of Entrepreneurship and Innovation Research (University of Wuppertal) and a research fellow at the Institute for Development Strategies (Indiana University). Urbig holds a PhD from Radboud University, The Netherlands. He studies entrepreneurship, innovation, and internationalization with a focus on cognition and decision making.

Siri Terjesen is on the faculty of American University's Kogod School of Business and the Norwegian School of Economics (NHH) in Bergen, Norway. Terjesen's research interests span entrepreneurship, corporate governance, and education. She holds a PhD from Cranfield, a masters from NHH, and a bachelors from the University of Richmond.

Vivien Procher is an assistant professor at the Jackstädt Center of Entrepreneurship and Innovation Research (University of Wuppertal). Procher studied at the LSE and HEC Paris and earned her PhD in economics at the Ruhr Graduate School of Economics. Her research interests range from international business innovation to entrepreneurship.

Katrin Muehlfeld (PhD, University of Münster) is a professor of management, organization studies, and HRM at Trier University, Germany, and is affiliated with Utrecht University School of Economics, the Netherlands. Muehlfeld's research interests include decision making and learning at individual, team, and organizational levels, and international (HR) management, especially the role of language.

Arjen van Witteloostuijn is a professor of economics and management at Tilburg University, University of Antwerp, and Cardiff University. van Witteloostuijn holds a PhD in economics from the University of Maastricht, The Netherlands. He is a multidisciplinary researcher in behavioral, economic, and social sciences on topics ranging from ambitious entrepreneurship to international trade.