Corporate Social Responsibility and Governance in young SMEs

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Change log

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[1]Please start with version 0.1. All minor changes will lead to a new number (0.2, 0.3, 0.4 etc.). The first complete draft will get the number 1.0. Again all minor revisions will lead to a new decimal number (1.1, 1.2, 1.3 etc.). A major revision will become 2.0 etc. etc. Until there is a final version which will be called 'final'.

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List of Abbreviations

BT	Business Talent
CSR	Corporate Social Responsibility
CT	Creative Talent
CG	Cooperation Game
DG1	Dictator Game 1
DG2	Dictator Game 2
ECFI	European Conference on the Future Internet
EI	Entrepreneurial Intent
E	Entrepreneur
E-H	Entrepreneur in High Stakes Experiment
E-L	Entrepreneur in Low Stakes Experiment
E-S	Entrepreneurial Student
FIRES	Financial and Institutional Reforms for the Entrepreneurial Society
GSOEP	German Socio-Economic Panel
IC	Incorporated Corporation
M	Mean
MNC	Multinational Corporation
MSc.	Master of Science
NE	Non-Entrepreneur
NE-H	Non-Entrepreneur in High Stakes Experiment
NE-L	Non-Entrepreneur in Low Stakes Experiment
NE-S	Non-Entrepreneurial Student
ORP	Other Regarding Preferences
p	p-value
PR	Public Relations
PVQ	Portrait Value Questionnaire
SCALE	Sharing and Cooperative Attitudes Lab Experiment
S.D.	Standard Deviation
SME	Small and Medium Sized Enterprise
SOEP	Socio-Economic Panel
SVS	Schwartz Value Scale
TOA	Tech Open Air
WVS	World Values Survey
z	z-value

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Executive Summary

This report has two related parts. Together they support the conclusion that a transition to a more Entrepreneurial Society will increase the overall adoption and implementation of corporate social responsibility (CSR) compliant behaviour in the economy.

First, we provide an overview of the relevant literature, collecting the available evidence on the link between corporate governance and CSR-performance in young, small- and medium sized companies (SMEs). From this literature review we conclude the evidence is rather scanty and weak due to data problems. What we can learn from the literature, however, is that the personality of the leading manager is often instrumental in implementing CSR-compliant behaviour, more so in SMEs than in multinational (MNCs) and incorporated (ICs) corporations.

The positive effect on CSR-compliance is thus conditional on entrepreneurs being socially oriented early on in the firm's life. To investigate if that is indeed the case, we present results of the Sharing and Cooperative Attitudes Lab Experiment (SCALE). We designed and implemented this experiment in Hamburg and Berlin in 2015-16. Our results will obviously have to be replicated in different settings to form a sounder basis for policy intervention, but the results across our three different subject pools show that indeed entrepreneurs tend to be more cooperative and sharing than non-entrepreneurs and future professional managers.

On the question: "How will the transition to a more Entrepreneurial Society affect the attitudes towards CSR?" we therefore tentatively conclude that the effect will be positive. This outcome is conditional on policies being put in place to ensure it is especially the creatively talented that (continue to self)select into entrepreneurship.

Policy implications we discuss in some detail in the report can be found in the design of educational programs, entrepreneurial support programs, fiscal and subsidy programs for (young) SMEs and public procurement procedures. All these policy instruments should be carefully (re)designed such that the creative, not necessarily only the business savvy entrepreneurs will benefit. As creatives thrive in high trust environments with little external control and few high-powered incentives, this will clearly prove most challenging in low-trust societies.

Introduction

Work package 3 in the FIRES-project establishes the need for and desirability of a more Entrepreneurial Society in Europe. In this report, we zoom in on desirability and answer the question whether an Entrepreneurial Society could bring benefits in the form of more CSR-compliant behaviour in the economy.[2] In an Entrepreneurial Society more economic activity will be organized in young SMEs and even the incumbent ICs and MNCs will be managed more entrepreneurially (Audretsch, 2007). Arguably, firms will therefore be managed and governed in different ways than in the Managed Economy (Audretsch and Thurik, 2001). But does this imply they will be managed more socially responsible?

We first assess that question by surveying the literature on CSR with an explicit focus on firm size and age. From this evidence, we learn that the personality of the top-manager is a key driver of CSR in any firm.[3] The evidence on CSR in SMEs, however, is limited, probably because collecting the data required to properly analyse it is complicated. There are many case studies, but they suffer from the "small *n* problem" and their generalizability is typically an issue as cases are often selected because they are interesting. The broader survey based studies suffer less from selection bias, but must deal with socially desirable answering, even if one can get the busy top-managers to respond. Finally, more rigorous statistical analysis requires internationally comparable data that is beyond the reported CSR statistics and is simply unavailable to date. The available evidence does suggest that, if anything, more socially oriented top-managers will lead to better CSR performance of the firms they manage.[4] It is therefore interesting to collect data on the social orientation of entrepreneurs.

The second part of the report presents the design and results of the Sharing and Cooperative Attitudes Lab Experiment (SCALE) we implemented in two cities in Germany to complement the existing evidence with new data. In our experimental design, we overcome the selection

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[2] In the definition of Holme and Watts (1999) CSR is "the duty of every company to protect the interest of society at large". We keep to this very broad definition here, implying that, when more firms adopt CSR, this will indeed be "beneficial" for society.

[3] In the remainder of this report we will refer to "top-managers" referring to founders and founding team in start-ups, owner-managers in non-incorporated SMEs and CEOs in incorporated and multinational firms. It refers to the strategic decision makers at the top of the hierarchy.

[4] Note that "better" here implies that CSR engagement is more genuine and penetrates deeper in the procedures and operations of the firm. It does not necessarily imply this CSR is also reported and communicated explicitly. See e.g. Baumann-Pauly et al. (2013) and Gamerschlag et al. (2011).

bias and socially desirable answering that plague case studies and survey based data.[5] In the SCALE-experiment we compared entrepreneurs to non-entrepreneurs (and MSc. students in economics) in a controlled environment and tested their willingness to behave cooperatively and share windfall gains. With the SCALE-experiment, we can answer the question: Are entrepreneurs systematically more cooperative and do they care more about others than non-entrepreneurs? Arguably, although we were not in the position to test this link more formally, such social attitudes also have predictive power on their willingness to consider the interests of other stakeholders and society at large in the ventures they are setting up. Our results suggest that entrepreneurs are indeed more cooperative and more generous than the non-entrepreneurs in our sample.

Considering the combined evidence presented in the literature review and the SCALE-experiment we conclude that first the link between personal characteristics and firm CSR performance maps out a fruitful area for future research. And second, the transition to a more Entrepreneurial Society is likely to support the trend towards a more socially oriented corporate sector when the right types (self)-select into entrepreneurial venturing. Because young SMEs typically cannot be bothered to join sweeping international initiatives and spend millions on CSR related reporting and communication, however, it may look as if CSR-compliance declines.

In our discussion, we propose some policy interventions that may help selecting especially creative talent into entrepreneurship. Under that condition society will benefit from the transition to a more Entrepreneurial Society.

This report starts with a literature review on CSR in young SMEs in section 2. Section 3 presents the set up and results of the SCALE-experiment and ends with our conclusions, the discussion of policy implications and the agenda for future research.

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[5] Because subjects are anonymous, randomly matched and play for real cash, we can trust the subjects to reveal their true preferences in their choices. Unfortunately, lab-experiments also suffer from the small n problem and need to be replicated often to ensure external validity of the results. Due to time and financial constraints, we could only replicate the experiment three times in different subject pools, all still in Germany. Further replication is beyond the scope of the FIRES-project but on the agenda for future research.

2. Literature Review: Corporate and Social Responsibility and Governance in young SMEs

CSR is a hot topic in the management and business economics literature. Google Scholar returns 415.000 results on "Corporate Social Responsibility" with two pages of academic books with only those words in the title. But zooming in on the empirical evidence on the relation between CSR and firm size and age, we quickly reduce the relevant literature to more manageable size. There is still a huge literature linking CSR to financial performance from the seminal paper by Cochran and Wood (1984) to Aigner (2016). These studies typically put financial performance on the left-hand side and firm size and age are often controls in the analyses performed there. But such analyses do not allow for inference on the link between firm size and age and CSR directly. In addition, as statistical and econometric analysis requires variables that quantify CSR. Therefore, these studies tend to zoom in on larger firms and MNCs that report more, better and in internationally comparable ways on their CSR performance. This problem seems pervasive. It is therefore largely unknown whether the propensity to display socially responsible behaviour is correlated with firm size. Based on their review of the literature Lepoutre and Heene (2006) conclude that SMEs in general and by extension young SMEs face more difficulties in engaging in CSR than their larger counterparts. Moreover, they cite several early studies (e.g. Observatory of European SMEs, 2002) that establish a (positive) link between firm size and CSR compliant behaviour. This finding was more recently confirmed by Gamerschlag et al. (2011) zooming in specifically on disclosure and the reporting on CSR. Reasons managers indicate in surveys for not engaging in CSR include lack of financial means (Palmer, 2000), organisational slack (e.g. Bourgeois, 1981; Bowen, 2002; Hitchens et al., 2005; Hunt, 2000; Schaper, 2002; Nohria and Gulati, 1996), lack of knowledge and competitive pressure (Gertsenfeld and Roberts, 2000; Anglada, 2000; Tilley, 1999). On first look it would therefore seem that an economy that is developing a high incidence of young SMEs will be less CSR-focused than an economy that is betting on large corporations. There is, however, more to tell. In this section, we first discuss the evidence on the CSR-firm size nexus. Then we turn to corporate governance structures and CSR. The role of top-manager characteristics in general and the social entrepreneur in particular are discussed before we conclude.

CSR in Small versus Large Firms

Behaviour is generally determined by institutional factors, external pressures and internal drivers in various and varying proportions. Closely matching these three factors and adding personal drivers of top-management, Lepoutre and Heene (2006) distinguished issue, personal, organisation and external characteristics as driving the willingness and ability to engage in CSR. Thus, to motivate the hypothesis that a growing prevalence of young SMEs would be moving us towards more CSR, we would have to make it plausible that SMEs find themselves in a more favourable institutional environment, feel more external pressure or are perhaps intrinsically more motivated to "do well by doing good".

The methodology for testing this hypothesis would be straightforward: we should compare which institutional factors have been found to apply in the case of young SMEs, and which in the case of large corporations. Similarly, we do this for external pressure, internal drivers and personal motivations. We would find factors that are less of a barrier to CSR-compliant behaviour for young SMEs than for large corporations and vv. Subsequently, we systematise these comparisons into an aggregate assessment. Obviously, this methodology would require sets of comparable standardised data, preferably across institutional settings (e.g. countries) on the object of study, CSR-compliance. In a literature review, we would then collect the studies that have followed these procedures, and inform the reader on shared or contradictory findings and on methodological flaws, if any.

Unfortunately, the state of the art in the literature does not (yet) allow us to adopt this straightforward approach. In fact, not much at all is known about the pertinent mix of these factors in explaining the incidence of CSR-compliant behaviour throughout economies (apart from truisms). As there clearly is a positive relation between firm size and CSR reporting (e.g. Gamerschlag et al. 2011) the sampling in the few studies that exist is biased and focused on large, publicly quoted firms. Generally, the literature on SMEs on the one hand, and CSR on the other, is therefore limited in quantity and quality. We concur with Vo (2011: 89), that it is "fragmented and underdeveloped".

It is not the literature that is to blame for this. Empirical research is fraught with difficulties because these factors are typically hard to substantiate or even proxy, so that it is unsurprising that conclusions are mixed if not at loggerheads (Chegut et al., 2011). To begin with, despite the term having achieved wide referencing, it is still ill defined what exactly constitutes CSR-compliant behaviour (Carroll, 1979; 2000). To some it is synonymous to ethical behaviour, to

others it includes discretionary behaviour (i.e. beyond focusing on what is considered the basic task of business, profit making); some focus on behaviour meant to mitigate environmental effects, others include a focus on care for workers that goes beyond paying decent wages, while others again focus on activities that are usually labelled as philanthropy. Secondly, aggregate data on SMEs, let alone on young SMEs, are difficult to come by, basically because publication requirements for SMEs are rather rudimentary, certainly in comparison with large corporations. Surveys suffer from biased response and socially desirable answering. Case research helps in getting to grips with some drivers as well as barriers, but makes it difficult to generalise, especially when no comparative analysis is endeavoured, as in Yu (2010). Third, SMEs are not usually tracked by organisations that provide CSR benchmark information and rankings (such as [Dow Jones](); [Sustainalytics]()). Thus, econometric research is, and will be, fraught with even more than the usual caveats in establishing and assessing relationships, e.g. those between firm size and CSR focus, or firm behaviour (either from a 'pure' economic perspective of from a CSR-perspective) and firm performance. In the case of young SMEs, all this is likely to be worse, since such firms do not have the historic record that we would need to perform any longitudinal comparison. Moreover, empirical research that has focused on the size-CSR nexus has focused on within-group variations. That is, it has focused on finding the correlates of CSR amongst SMEs (and micro-firms) only (e.g. Lepoutre and Heene, 2006).

Corporate Governance and CSR

Corporate governance structures have been found important in the implementation of CSR in large and small firms alike (Aras and Crowther, 2016). These structures are partially chosen and partially imposed and can differ significantly over jurisdictions and sectoral or corporate cultures. Professional observation tells us, for example, that SMEs and especially start-ups do not have the elaborate governance structures that are legally required for publicly quoted, usually large, firms. That is, they usually do not have supervisory boards with a certain number of independent members. The two-tier type of governance, prevalent in e.g. Germany and the Netherlands, has been given an explicit oversight task, sometimes on behalf of other stakeholders than just shareholders. Although it remains an unanswered question to which extent this requirement is really met in practice, Dutch supervisory boards are even legally required to attend to the "interests of the firm", not its shareholders per se. The most recent

Dutch corporate governance code has added that this interest should be interpreted as the long-term interest of the firm (Monitoring Committee, 2016). In an economy that is focused more on short-term gains, this obviously provides ample room for debate, thus for CSR awareness, and maybe a rise in CSR-compliant behaviour.

The soft law of corporate governance codes, however, is usually only applicable to quoted firms (although unlisted companies may decide to introduce these on their own account). Following institutionalist thinking (e.g. DiMaggio and Powell, 1983), it could be argued that as more large firms display CSR-compliant behaviour, more SMEs would follow, because it is 'in the air', or a 'sign of the times'. Obviously, CSR-inclined large firms could also be pushing for CSR-compliant behaviour in their supply chain. But their success in doing so ultimately comes back to two issues which we will discuss further below, i.e. the degree to which young SMEs are permeable for ideas that trickle down from large corporations and the importance of the views of top-managers in the domain of CSR.

On the former, it is noteworthy to remark that although the totality of SME behaviour has significant social and environmental impact, each individual firm's impact is mostly negligible.[6] Individual firms, therefore, are likely to feel less responsible for social and environmental impacts than would be the case for large firms. Normally this will lead to off-loading awareness upon others. From this, one can hypothesise that feelings of guilt deriving from the severity of impact may not be a strong motivator for CSR-compliant behaviour in SMEs. Alternatively, however, as Vo (2011) has noted, SMEs may be particularly sensitive to some CSR issues because their top-managers (i.e. owner-managers) experience these in person, together with their family and employees, so that such issues may chime relatively well in the company.

Connected to the differences in corporate governance between large and small firms is the fact that SMEs do not face the elaborate requirements on reporting and risk assessment, including extensive disclaimer statements that large firms often must respect. With the increasing incidence of integrated reporting, large firms are thus forced to demonstrate awareness of CSR issues (Humphrey et al., 2014). There is no such requirement yet in the domain of SMEs. Moreover, internationally agreed codes of responsible behaviour (e.g. the *Principles for Responsible Investment*, initiated in 2005), to which firms can commit

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[6] E.g. Parker et al. (2009) estimate that around two-thirds of environmental pollution originates in SMEs and according to the EC (2016) they employ 90 million people or about 2/3 of EU-28 employment.

themselves by formal statement, are typically the province of large, internationally operating corporations in specific global industries like insurance and capital investment.

Although it is an open question whether such corporate governance systems encourage or discourage CSR-compliant behaviour or just promote ticking processes, large corporations and young SMEs clearly operate in very different governance systems. One might even state that because the behaviour of large firms may have large effects on the environment, climate change, pollution and the social welfare of their employees, society has imposed corporate governance systems that make top-managers in large MNCs pay more attention to CSR than they would perhaps have done without these governance systems. For young SMEs such external constraints are much less stringent.

The corporate governance aspects that typically characterize young SMEs (e.g. charismatic leadership, informal communication channels, flat hierarchies and proactive stakeholder engagement), however, are consistently found particularly important in MNCs and SMEs alike in predicting comprehensive implementation of CSR practices (Jamali et al., 2009; Lerberg-Jorgensen and Steen-Knudsen, 2006; Rahbek-Pedersen, 2009). This implies they engage CSR not necessarily less, but more voluntarily and therefore very differently. In one of the rare comparative case studies we encountered on this question, Baumann-Pauly et al. (2013) conclude that indeed the visibility of SMEs is lower and for that reason top-managers in SMEs (often the founder or owner-manager) will engage in CSR from a much more personal motivation. They typically select smaller issues, closer to home (e.g. hiring handicapped people from the local community rather than reporting on carbon footprint to fight global climate change), communicate and report on it less but at the same time embed their CSR-compliance much more profoundly in the organisational processes.

Top-Manager Personality Traits and CSR

Since the behaviour of SMEs, and by extension young SMEs, is depending much on the personality attributes of their owner-managers and founders, this would suggest studying whether these individuals display higher degrees of openness and intrinsic motivation towards CSR issues than executives of large firms. More generally, we would be interested in studies that have uncovered the personality attributes of CSR-compliant behaviour.

Already in 2005 Hemingway studied the philosophical and psychological concepts that would be involved in answering this question. Unfortunately, this has not been followed by a great

number of empirical studies, with the notable exception of Chin et al. (2013) and Gupta et al. (2017). Neither of these studies relate to any differences between (young) SMEs and large corporations. Instead, they exclusively focus on the largest US firms. Still their findings are very interesting from the perspective of the current project. Chin et al. (2013) examine a sample of 249 US CEOs for testing the hypothesis that liberal CEOs would emphasise CSR more than conservative CEOs.[7] It turns out that liberal CEOs exhibit greater advances in CSR and that CSR initiatives in firms run by liberal CEOs are less contingent on previous performance. Gupta et al. (2017), essentially using the same idea, asking whether it is possible to extend this from CEOs to what they call the firm's body politic, i.e. the ideological footprint of the firm's employees. The firm's body politic is what ultimately results when individuals feel "attracted to places where current members and policies suit them, and organizations correspondingly select new individuals who appear to 'fit'." (Gupta et al., 2017: 1020). They too find a strong association between organisational ideology and advances in the three forms of CSR that were examined (among others using categories that gauge the firm's commitment to product quality, employee relations, community relations, environment, human rights and female representation in executive ranks). These effects appear stronger when the CEO has had long organisational tenure and therefore more time to influence the organisation.

In a related piece of work Gupta and Wowak (2017) show that the Board's ideological orientation also predicts level and structure of executive pay (conservative boards pay CEOs more than liberal boards and the relationship between recent firm performance and CEO pay is stronger for conservative boards than for liberal boards). These results are interesting because they suggest that political ideology is a strong predictor of CSR-compliance, rather than—or next to—institutional factors and external pressure. They suggest that a firm's culture as well as its strategies may be more dependent on the political orientations of the people that are leading it than, for example, on economic rationales and legal requirements.

Translating these findings in terms of our main goal, the question would arise: Are owner-managers of young SMEs relatively more of liberal orientation than top-level executives of large corporations? Unfortunately, we cannot answer this question, since no literature on the subject is available. Still, after studying 355 small and micro firms located in central Italy, Testa et al. (2016) suggest that similar conclusions would be drawn for the case of SMEs, i.e.

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[7] Where Chin et al. (2013) proxied ideological type by coding political donations over the ten years prior to becoming a CEO.

that next to external pressures, entrepreneurs' attitudes are the most important predictors of environmental proactivity both for small and micro firms. They also find that the extent to which CSR-relevant information, expertise and training is available or supplied, preferably by non-partisan parties like governments, the likelier it is that motivations are triggered or built, thus contributing to CSR-compliant behaviour (Spence et al., 2000). The evidence available is circumstantial, but clearly suggests that the incidence of CSR is heavily dependent on the personality attributes of top-managers and leading employees.

The Social Entrepreneur?

Added to the heterogeneity that is so typical for SMEs, the last few decades have seen the rise of firms that have been explicitly set up to serve a social or an environmental cause. More and more, often young firms that have embraced the idea of social enterprise (see e.g. Lepoutre et al., 2013; SER, 2016). Such firms have not been set up to earn the owner an income or profit but to change the way in which businesses normally operate, i.e. as organisations that hire labour for serving a cause that is considered valuable if not crucial for society or the survival of the planet rather than for serving the perceived and narrow financial interests of the owner and/or financiers. Developments in social entrepreneurship are promising, but quantitatively not very important yet (Lepoutre et al., 2013). Still it is noteworthy that the phenomenon is almost fully carried by young SMEs and by SMEs that have gone through a turn-around. Large established firms would have to go through such an extensive process of reconstitution that it might take years of off-business focus to get them aligned with this new way of doing business. Therefore, it seems likely that the propensity to engage in this type of CSR-compliant behaviour will be much higher among young SMEs (in fact, start-ups) than among large corporations. In addition, social entrepreneurship is, by definition, not motivated by profit. It is instead largely brought about by intrinsic and deeply personal motivation of the founder or owner-manager.

This brings back into focus the personality of the entrepreneur in general. Is she indeed more social than the average person, or are the 0.2-4.9% of adult populations across 49 countries reported "engaged in social entrepreneurship" in Lepoutre et al. (2013) an exception to the rule? Early survey based evidence suggests entrepreneurs perceive themselves to be more ethical than their peers (e.g. Ludevid Anglada, 2000; Tilley, 2000; Vitell et al., 2000) but it remains to be seen if such (self-reported) high ethical standards indeed translate into actual

behaviour. According to Lepoutre and Heene (2006) the literature specifically addressing the ethical orientation of entrepreneurs goes back to the work of McCuddy and Peery (1996), Quinn (1997), and Zahra (1989) who connected well-known entrepreneurial traits, such as locus of control, need for achievement and tolerance of ambiguity to more ethical behaviour. More recent studies by Solymossy and Masters (2002), Morris et al. (2002), Yurtsever (2003) and Longnecker et al. (2002) present evidence that indeed leans towards entrepreneurs being more disposed towards CSR than managers in large corporations. Such good intentions, however, are put to the test in situations where free riding of competitors cannot be excluded (e.g. Vyakarnam et al., 1997) and entrepreneurs are constrained in their ability to engage in CSR due to lack of time (e.g. Hitchens et al. 2005), resources and knowledge (e.g. Brio and Junquera, 2003). Baumann-Pauly et al. (2013) conclude that for that reason owner-managers of young SMEs implement CSR policies in different ways and with different, perhaps less visible results. MNCs where such personal characteristics in the corporate governance were missing, were found to more likely end up with a façade of strong commitments and communication that is detached from the core business of the organisation (Banjeree, 2007; Haack et al., 2012). In MNCs the CSR looks better, but often runs only skin deep, whereas in SMEs it is perhaps less visible but often its commitment runs right down to the core.

A final reason to focus on the personal attitudes of the founder-entrepreneurs in young SMEs is given by Schein (1983, 1990, 2010). His work shows that the cultural attitudes and "firm DNA" are heavily influenced by the founder-entrepreneur. Bill Gates for example said in an interview with Rolling Stone Magazine (2014): "I start with architecture, and Mark [Zuckerberg] starts with products, and Steve Jobs started with aesthetics." That very basic difference in approach to, in this case, software development can still be traced in the now mature and billion dollar corporations these entrepreneurs founded. The lasting influence of firm founders' background, attitudes and leadership is confirmed in e.g. Beckman (2006) and for family firms specifically in Kelly et al. (2000). It suggests that owner-managers of young SMEs shape the culture of future mature large corporates which may even be more relevant than the behaviour of the SMEs themselves in their early years.

Conclusion

Having surveyed the literature that connects in case studies, surveys and more sophisticated statistical analyses CSR-compliance to firm size and age, we conclude first that a lot more

research needs to be done to get to more definitive answers on this important question. Empirical research in this area had a strong focus on the financial and CSR-performance link and has been held back by a combination of limited data on both CSR and SMEs. Second, from the little available evidence we gathered we may conclude that the personal motivations and preferences of leading managers are an important driver for CSR-compliance and, more importantly, for the overall socially responsible behaviour of firms. Strong evidence for the case of SMEs is lacking, but given their less formal governance structure, we hypothesise this is likely to be stronger for SMEs than ICs and MNCs.

This motivates us to investigate in more detail the social attitudes of young SMEs founders. For that purpose we designed the Sharing and Cooperative Attitudes Lab Experiment (SCALE). In the next section, we introduce and present our experimental design and the results from three subject groups we have recruited. In this experiment, we can investigate directly how willing founders/owner-managers of young SMEs are to cooperate and share.

3. The Sharing and Cooperative Attitudes Lab Experiment

In the above we have established that it matters a lot how entrepreneurs manage their firms. Given the novelty and uncertainties involved in entrepreneurial venturing, they face much less established rules and protocols, much less scrutiny and much less regulation to hold on to or hide behind. In addition, time and resource constraints reduce the ability and attention an entrepreneur can pay to CSR compliance. Therefore, we see SMEs spend little time and effort on reporting, communication and joining global initiatives and organisations (Gamerschlag et al., 2011). Instead, in young SMEs, CSR develops much more hidden but is embedded much stronger in the processes and corporate culture that is forming as the firm matures (Baumann-Pauly et al., 2013). In this process, it is the moral compass of the entrepreneur and that of the members of the founding team, that determine the direction and societal impact of the venture being developed. Moreover, the imprint of founders on their firms' culture is profound and therefore their attitudes have a lasting impact how the firm will behave in the future. It would therefore probably be bad news if the institutional environment motivates, selects and promotes entrepreneurs with little regard for other concerns than their own, private income, profit and wealth. If entrepreneurship, because of its inherent lack of strong and established institutionalized constraints, gives free reign to the strong in society to prey on the weak, a transition to a more Entrepreneurial Society would perhaps be a bad idea, even if it brings economic benefits on average. Fortunately, there is hope and people, including entrepreneurs, are rarely as single minded, self-interested and unboundedly rational as standard economic theory typically assumes. The latter model may be a reasonable approximation for the description of long-run aggregate equilibria to which evolution and learning push all agents in the economy through selection and frequent feedbacks. We know that in the end economic incentives matter (e.g. Camerer and Fehr, 2006). But we also know that this decision model fails miserably as a description of actual economic behaviour in the short run and at the micro level (e.g. Gneezy et al., 2011). Real decision makers, including entrepreneurs, operate in a social context, hold strong preferences for fairness and equity and may have limited cognitive capabilities to act fully rationally even in maximizing their social preferences. The theory of other-regarding preferences (ORP) assumes peoples' utility functions incorporate the outcomes or consequences of other people by some dimension. Most of the models developed in this context are based to some extent on a concept of fairness (Camerer and Fehr, 2006). To investigate the degree to which entrepreneurs have ORP, we can make use of game theoretic concepts, which allow us to closely study altruism and cooperative behaviour by contrasting it

to the predictions of behaviour under the assumption of narrowly self-interested preferences and unboundedly rational behaviour. As will be outlined in more detail in the following section, we make use of two simple games to capture the preferences of interest to us: in case of eliciting the preferences of fairness and altruism we let subjects play a simple, one shot (static) dictator game; for measuring cooperative tendencies, we apply a dynamic voluntary contribution game. Dynamic games are played over time (i.e. over several rounds or periods) and allow players to develop ongoing relationships (Aumann and Hart, 1992). A feature of iterated games is that choices made in each period, do not only affect the payoff of the current period, but also influence future interactions of the players. Further, by providing feedback or information to the players during the game, i.e. about the behaviour of the counterparty, we allow for learning and potentially adjusting one's own strategies throughout this game. The rational game-theoretic equilibria in repeated games are determined by backward induction. This implies anticipating the behaviour of the counterparty in the last round of the game and to adjust one's own behaviour according to this expectation. This process is repeated iteratively for the second to last round and so on, until the first round of the game is reached. [8] The voluntary contribution game in our case presents a social dilemma. Social dilemma games are characterized by a Pareto deficient equilibrium, and off-equilibrium behaviour within these games is generally interpreted as *cooperative* behaviour because cooperation within the context of these games increases efficiency as well as overall welfare. Hence, immediate self-interest within these games conflicts with social efficiency. In a voluntary contributions game both parties benefit from the cooperation but defecting cooperation (also termed freeriding) remains the dominant strategy for every individual in the game. In this section, we next outline our motivation for eliciting these preferences in the context of entrepreneurship and describe the games applied for this purpose in more detail. Then we describe how these games were implemented in three different instances and groups of subjects. After presenting and analysing the results we briefly conclude.

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[8] Strategies that take into account the whole sequence of periods is termed „super game", while each period and its adjunct previous/following period is termed a sub-game.

Theory and Hypotheses

The theory of other-regarding preferences (ORP) assumes peoples' utility functions to incorporate the outcomes or consequences of other people (generally their monetary payoff) to some dimension. Most of the models developed in this context are based to some extent on the concept of fairness.[9] To investigate the degree to which entrepreneurs hold positive ORP, that is, they weigh the welfare of others positively in their own utility, we make use of game theoretic concepts, allowing us to closely study altruism and cooperative behaviour, by contrasting it to the predictions of behaviour under the assumption of narrowly self-interested preferences and unboundedly rational behaviour. As will be outlined in more detail in the following section, we make use of two simple games to capture the preferences of interest to us: in case of eliciting the preferences of fairness and altruism we let subjects play a simple, one shot (static) dictator game; for measuring cooperative tendencies, we apply a dynamic voluntary contribution game. Dynamic games are played over time (i.e. over several rounds or periods) and allow players to develop ongoing relationships (Aumann and Hart, 1992). A feature of iterated games is that choices made in each period, do not only affect the payoff of the current period, but also influence future interactions of the players. Further, by providing feedback or information to the players during the game, i.e. about the behaviour of the counterparty, we allow for learning and potentially adjusting one's own strategies throughout this game. The rational game-theoretic equilibria in repeated games are determined by backward induction. This implies anticipating the behaviour of the counterparty in the last round of the game and to adjust one's own behaviour according to this expectation. This process is repeated iteratively for the second to last round and so on, until the first round of the game is reached.[10] The voluntary contribution game in our case presents a social dilemma. Social dilemma games are characterized by a Pareto deficient equilibrium, and off-equilibrium behaviour within these games is generally interpreted as *cooperative* behaviour because cooperation within the context of these games increases efficiency as well as overall welfare. Hence, immediate self-interest within these games conflicts with social efficiency (as is the case in many real-world situations). In a voluntary contributions game both parties benefit from the cooperation but defecting cooperation (also termed freeriding) remains the

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[9] The literature distinguishes between different types of ORP: (1) distributive ORP (Bolten, 1991; Bolton and Ockenfels, 2000; Fehr and Schmidt, 1999), (2) reciprocal ORP (Fehr et al. 1993; Berg et al. (1995), (3) both distributive and reciprocal ORP (e.g. Bolton and Ockenfels, 2000; Charness and Rabin, 2002; Dufwenberg and Kirchsteiger, 2004).

[10] Strategies that take into account the whole sequence of periods is termed „super game", while each period and its adjunct previous/following period is termed a sub-game.

dominant strategy for every individual in the game. In this section, we next outline our motivation for eliciting these preferences in the context of entrepreneurship and describe the games applied for this purpose in more detail. Then we describe how these games were implemented in three different instances and groups of subjects. After presenting and analysing the results, we briefly conclude.

Fairness and Altruism in the Entrepreneurial Context.

Understanding how entrepreneurs perceive fairness and to what degree they behave altruistically might offer important insights, not only in relation to devising government policies inducing desirable behaviours but also for gaining a better understanding of entrepreneurial decision making in general. Empirical investigations regarding entrepreneurs' social preferences in the literature appear scarce; a notable exception are the studies by Weitzel et al. (2010) and Urbig et al. (2010). Weitzel et al. (2010) empirically investigate selfish behaviours of entrepreneurially *talented* people (using a student sample), by analysing allocation choices within various forms of dictator games. Their findings show, that people with high business talent (self-efficacy) generally care less about others within these games. Subjects' beliefs regarding their own creative and business skills (relative to their peers) play a significant moderating role and lead to systematic differences in the findings: whereas all other groups cooperate and give approximately the same, subjects indicating higher talent in business-related skills and low creative skills allocate significantly less money to their counterparty. Considering these findings, we control for entrepreneurial self-efficacy in our experiment. Moreover, we partially replicate their design, and expand it with a standard cooperation game to be able to test for the importance of strategic interaction (see section on cooperation) using actual entrepreneurs and professionals as well as students as subjects.

Urbig et al (2012) complement the study by Weitzel et al (2010) and investigate how student subjects with entrepreneurial intent exploit risky investment opportunities with positive and negative externalities. The authors find subjects with high levels of entrepreneurial intent to invest significantly less into destructive scenarios. This suggests that individuals with the intent of becoming an entrepreneur might exhibit higher levels of ORP than others.

Within their experimental design, Urbig et al. (2012) control also for entrepreneurial talent (self-efficacy) and find, in line with the findings by Weitzel et al. (2010), individuals scoring high on business talent items to invest significantly more into the destructive scenarios.

Taking these results together, one may conclude that entrepreneurial intentions are good, as is creative talent to become an entrepreneur. But (self-reported) business talent would seem to characterize the less socially oriented. However, one could raise concerns of external validity due to the application of the experiment in a student subject pool rather than experimenting with actual entrepreneurs. That is, students who express an interest in starting a business and self-assess their ability to do so, may well not be the people that go on to become (successful) entrepreneurs later in life. If their willingness and ability to cooperate and share has any systematic relationship to their probability of starting a venture, then such selection effects may well offset or even reverse the results. Our first contribution to this emerging literature therefore consists of implementing the same game with a subject pool of actual entrepreneurs. To be more specific, we want to investigate whether entrepreneur's other-regarding preferences differ to those of non-entrepreneurs. Past research has made extensive use of experiments in this regard (e.g. Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000; Andreoni and Miller, 2002) and findings clearly demonstrate that people generally do care about the outcome of others. To the best of our knowledge, we are the first to show how entrepreneurs compare in this regard.

To test for the preferences of altruism and fairness, we follow Weitzel et al. (2010) and make use of the standard dictator game (Kahnemann et al., 1986; Forsythe et al., 1994) in our experimental design. In the classic dictator game, originally invented to test the income maximization assumption, there are two players: the dictator and the recipient. The dictator, endowed with a sum of money, decides how much of her endowment she is willing to allocate to the recipient, who simply must accept the offer.[11] Standard behavioural assumptions in economic theory would predict the dictator to make zero allocations, as this strategy maximizes her private returns. However, past research (Engel, 2010) has shown most dictators deviate from this strategy and allocate some of their endowment to the recipient. A review of the evidence shows that average offers range between 0.275 and 0.383 between Western and indigenous cultures (Engel, 2010) and vary significantly over time and space within these groups. These differences have been related to cultural and social characteristics. Concepts used to explain the behaviour in this game range from the notion of fairness and altruism to inequity aversion (e.g. Kahneman et al, 1986; Rabin, 1993; Fehr and Schmidt,

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[11] It is important to note that the recipient's role in this game is completely passive, i.e. he cannot object the allocation decision of the dictator (as in the Ultimatum Game). Moreover, both the dictator and the recipient are anonymous and randomly assigned roles. Consequently, strictly speaking, since any strategic component or risk is missing, the dictator game does not really qualify as a game but an allocation task.

1999). For a debate on this, see for example Binmore and Shaked (2010) and Fehr and Schmidt (2010). For our research, it is mainly important to note that the caring behaviour measured in this game is a form of *unconditional* kindness and hence unrelated to the concept of reciprocity (Fehr and Gächter, 1999) or strategic interaction. These notions we therefore investigate separately in our experiment and outline in more detail in the following section. The results in Urbig et al. (2012) suggest we might expect a positive difference, as entrepreneurial intent correlates positively with social behaviour, but we do not have a directional hypothesis in relation to the concept of altruism. We are rather interested how entrepreneurs' action within these games compare to those of other subject groups.

Cooperation and Venture Success

We know from stakeholder theory the importance for firms to build strong and trusting relationships with relevant stakeholders (Barringer and Harrison, 2000). Such relationships are especially important in the context of entrepreneurship. Faced with major resource constraints entrepreneurs need to develop strategic relationships as to successfully found and grow their ventures (Maxwell and Levesque, 2014; Pollack and Bosse, 2014; Sheperd and Zacharakis, 2001). Moreover, entrepreneurs generally need to initiate and build most of these relationships themselves and from the ground up. New ventures, by definition, lack a record of accomplishment, and engage in innovative, risky activities. This might induce behaviours and decision-making not captured by general stakeholder theory (Pollack et al. 2017). For example, research in the field of entrepreneurial finance has shown the reliance on reciprocal, cooperative relations and social control mechanisms, like trust, to be potentially more important than standard formal control mechanisms (Sapienza and Korsgaard, 1996; De Clercq and Sapienza, 2001; 2006).[12] Further, entrepreneurial environments are characterized by high risk and uncertainty (Knight, 1921), information asymmetries (Dutta and Folta, 2015) and oftentimes misaligned interests (Cable and Shane, 1997). All circumstances offering a viable environment for opportunistic behaviour. Especially, since the given context does not allow for the design of complete and enforceable contracts (Williamson, 1985; Cable and Shane, 1997; Hellman, 2007). Consequently, trust and cooperation (social norms) between the parties appear to be essential for overcoming fear of opportunistic behaviour. Inaugurating qualitative and long-term relationships is therefore important for risk reduction[13] and venture

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[12] E.g. having the investors on the Board of Directors.
[13] Thereby, referring to the reduction of performance risk. Obviously, entering a relationship introduces relational risk.

success (Mayer, Davis and Schoorman, 1995; Howorth and Moro, 2006; Schoorman et al. 2007; Welter and Smallbone, 2006; Larson, 1991; Parkhe, 1993) and e.g. Suarez-Villa (1998) shows that entrepreneurial firms engage in significantly more cooperative strategies than their larger, more mature counterparts. The ability and willingness to cooperate could therefore be an important asset to entrepreneurs. We investigate cooperative behaviour of entrepreneurs by using a dynamic voluntary contribution mechanism, called a standard public good game (see Ledyard, 1995), in our case with two players.[14] Dilemma games, such as the public good game, are generally used for modelling and studying interactive and strategic behaviour of individuals. The game's set-up is as follows: At the beginning of the game, each player, i=1,2, is given a certain monetary endowment. The players then *simultaneously* decide, how much of their endowment they want to invest to the creation of a public good or project.[15] The individual's monetary payoff π_i strategically depends to the actions of the counterparty and is defined by the following payoff function:

$$\pi_i(g_1, g_2) = endowment - g_i + \alpha\,(g_1 + g_2)$$

Thereby, g_i denotes player $i's$ contribution to the project. The production function of the project is given by the sum of both players' contribution to the public good $(g_1 + g_2)$. The marginal per capita return of investing into the project is given by α. Since the game is designed as a social dilemma game, it must hold that 1/n < α <1[16]. Based on this condition, whatever the contribution of the opponent, the marginal cost of investing (equal to one) is higher than the marginal return of investing and the dominant strategy for both players would be not to invest any endowment to the project $(g_1 = g_2 = 0)$. The Nash Equilibrium payoff is therefore defined by $\pi_i^{NE} = endowment.$ However, since the joint marginal return $(n^*\alpha)$ is *higher* than the cost of investing, the Pareto efficient outcome is characterized by both players contributing their entire endowment to the project. In that case, the payoff to both players is $\pi_i(g_1, g_2) = 1.4 * endowment.$

This game has been used extensively in experimental economics to study whether individuals play the self-interested Nash solution or act cooperatively and contribute to the project. Playing the game in an iterated version further allows us to measure subjects' levels of conditional cooperation or reciprocity.

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[14] We apply non-cooperative game-theory, entailing only situations in which contracts or arrangements are not binding or enforceable, resembling the entrepreneurial environment.
[15] The project in our case was not framed or specified further. It was just called "the project".
[16] In our experimental design, α was set at α=0.7.

An important technical distinction needs to be made between reciprocity and cooperative behaviour. While the former is described as responsive behaviour to the previous actions of the counterparty *regardless* of potential future material gains/losses, cooperative behaviour is rather in direct relation to these future potential payoffs (Fehr and Gächter, 2000). The willingness to contribute to the project because other players are also contributing describes the notion of positive reciprocity. Negative reciprocity arises when an individual, who contributed to the project in the previous round of the game (t-1), while the counterparty contributed nothing or significantly less (free-rode), decides in the current round (t) of the game to penalize the counterparty for this behaviour by contributing significantly less (or zero) to the project (tit-for-tat). This means that after several rounds of the game, the behaviour of free-riders and (negative) reciprocators is indistinguishable when considering their contribution levels in the current round only. The same holds for (positive) reciprocators and players who always play a cooperative strategy. In game theory, it has been shown that variations of a tit-for-tat strategy in (infinitely repeated or open ended) games can sustain cooperation even among self-interested individuals (Axelrod, 2006). That is, cooperation need not be the manifestation for ORP, but it has also been shown that the cooperative equilibrium is much easier to reach and sustain when ORP and some altruism is present (Camerer and Fehr, 2006).

In our experiment, we empirically investigate whether cooperative types, who understand the importance of strategic cooperation, are more prevalent in the entrepreneurial environment. The context of the public good game has also been used to analyse the establishment and maintenance of social norms (Ostrom, 2014). Understanding the occurrence (or lack thereof) and nature of social norms seems particularly relevant in an entrepreneurial environment, where contracts are oftentimes informal, due to the high level of uncertainty surrounding this field. Fehr and Gächter (2000) describe the important impact of social norms in our decision-making, be it in our personal or working life, and state "[…] the role of reciprocity as a norm enforcement device is perhaps its most important function." (p.168). Because entrepreneurs should be more experienced with cooperation and understanding the strategic importance thereof, we expect this group to exhibit higher levels of (conditional) cooperation in the public good game.

Cooperation Hypothesis

We expect entrepreneurs to exhibit higher average contribution levels in the Cooperation Game in relation to the other subject groups.

Recruitment Procedure

For our entrepreneurial subject pool, we conducted so-called lab-in-the-field experiments at two different entrepreneurship conferences in Hamburg and Berlin. Both conferences had a strong focus on high technology and innovation – particularly in relation to the internet. The first four experimental sessions were conducted at the ECFI – the European Conference on the Future Internet in Hamburg in November 2015.[17] More than 1000 international guest participated at the conference. The crowd consisted largely of entrepreneurs, venture capitalists, business angels, accelerators and scientists. The conference provided numerous workshops (e.g. hackathons), lectures, pitching competitions, and networking opportunities; all catered towards an entrepreneurial crowd.

An additional four sessions were conducted at the Tech Open Air (TOA) in Berlin, one of Europe's leading interdisciplinary technology festivals.[18] The festival is a well-known technology conference (founded in 2012) in and out of Europe.[19] At Tech Open Air, a large number of entrepreneurs, investors and start-ups (predominantly from the digital and high technology industry) come together, with the aim of generating a platform for multidisciplinary knowledge exchange, collaboration, and development. The conference's program includes speeches, pitches and various workshops, again catered to an entrepreneurial crowd. The experiment was computerized using the experimental software z-Tree (Fischbacher, 2007) and run via a mobile laboratory, consisting of 20 laptops and sideboard blinders to increase the level of anonymity and privacy.[20]

The recruitment process for both conferences was identical: Subjects were recruited directly at the conference location. Upon approach, it was briefly explained to them that they had the opportunity to participate in a decision-making experiment in which they, based on their decisions, could earn money. Potential subjects further received information about (a) the location of the room (which was also provided in the programs of the conferences), (b) the duration of the experiment and (c) the different time slots available for participation. Additionally, flyers with this information were handed out. We cannot, based on the

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[17] Note, all sessions were conducted as high-stake treatments.

[18] Thereby, 2 sessions were conducted as low stake treatments and 2 were conducted as high stake treatments. It was randomly decided at the beginning of the session (by getting a randomly chosen subject to pick a sealed envelope, with the choice of whether the session would be played as high or low stake treatment).

[19] TOA started in Berlin but has also organized conferences in Los Angeles and Tokyo.

[20] In particular, in relation to the games played anonymity is very important as to avoid reputation concerns, beyond those intended by the game, are avoided.

questionnaire design, make any statements regarding the degree of acquaintance between the subjects. However, throughout the recruitment process people were generally approached individually or if they were in pairs, they were asked to come to sessions at different time slots. Additionally, we beforehand set the minimum level of subjects per session to N=8, to assure sufficient anonymity.

All eight sessions lasted between 45 and 60 minutes. When subjects arrived at the experimental lab, they were randomly allocated to one of the 20 laptops. This was done by blindly drawing a numbered ticket, linked to one of the laptops. Once all subjects were allocated to a laptop, the experimental instructions were read out aloud by the experimenter and at the same time visible on the computer screens. Subjects were informed not to communicate with each other throughout the entire experiment. Also, they were ensured that all information provided by them would be treated confidentially and anonymously and that none of the other participants would be able to trace their contribution decisions back to them. During the first instructions, subjects received information about the general structure of the experiment and the incentive compatibility mechanism of the experiment. Finally, they were informed that they would receive further, more detailed instructions once they would enter the different parts of the experiment.[21] Subjects had the opportunity to raise their hand and ask the experimenters questions throughout the entire experiment.

The experiments with the student subject pool were conducted in the laboratory of Humboldt University in Berlin in Mai 2017. Here students from the field of business and economics were recruited via the recruitment system ORSEE (Greiner 2015). In total N= 62 subjects participated. The operational procedure in the laboratory was identical to the one outlined for the participants at the conferences. Sessions lasted again between 45-60 minutes.

Experimental Structure of SCALE

The experiment itself consisted of several different parts, which will be outlined in detail next. The first four parts of the experiment represent the incentive compatible parts, followed by a questionnaire collecting control variables, which, based on past research, might be relevant for the study at hand. We changed the stake sizes of the incentive compatible part of the experiment (i.e. the Holt and Laury Lottery, the Dictator Games, and the Public Good Game) within our entrepreneurial crowd sample.

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[21] Copies of the complete instructions are available from the authors upon request.

Holt and Laury Lottery

In the first part of the experiment, subjects played a "Holt and Laury" lottery, whereby ten paired lottery choices (lottery "A" and lottery "B") were presented. Subjects have, for each of the 10 presented lottery pairs, to decide which lottery type (A or B) they would prefer to play. This method allows eliciting an individual's level of risk preference by observing at which lottery pair an individual makes the crossover from lottery "A" (the less risky lottery) to lottery "B" (Holt and Laury, 2002). A participant consistent with standard expected utility theory (monotonicity axiom) can only have one crossover point. Further, the crossover always goes from the safe option (A) to the risky option (B). Finally, sticking with option "A" for all 10 lotteries violates the axiom of dominance. Some of our participants do violate the assumptions of rational behaviour within this game (i.e. depicting more than one crossover point), hence exhibiting inconsistent risk attitudes. These individuals are eliminated from the analysis whenever risk attitudes are assessed. Higher values of this variable denote higher levels of risk aversion. In the high /low stake treatment subjects could earn up to €15.40 / €3.85 Euros in this part, respectively.

Dictator Game 1

In the second part of the experiment, subjects played the first dictator game.[22] Thereby, subjects received the general instructions of the game, and were informed that the computer would randomly assign them to the role of "participant 1" (the dictator) or "participant 2" (the receiver). The game was worded in an unframed, neutral context, in which simply an "opportunity" was presented. All student subject dictators received an endowment of 5 Euros. The endowment in the entrepreneurial sample varied: dictators received a 20 Euros endowment in the high-stake case, and a 5 Euros endowment in the low stake case. All endowments were payoff relevant. Instructions further highlighted that the matched counterparty would hold only for this part of the experiment and be randomly matched anew for each of the following parts. Subjects were further informed that no money earned in any part of the games could be transferred to other parts. Next, subjects had to answer comprehension questions to ensure their understanding of the payoff function. Once completed, the computer randomly allocated the roles, and the dictator made his/her

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[22] Note, subjects were not informed of playing another dictator game later in the experiment. They were simply told there would be several different parts of pay-out relevant games.

allocation choice. It was possible to split the endowment in cent amounts.[23] The receiver did not obtain any feedback information regarding the dictator's choice until the very end of the experiment, as we wanted to avoid subjects being potentially influenced by feedback regarding the received contribution (or lack thereof) in the following games. Since we are interested in eliciting subjects' intrinsic preference of altruism/ fairness in this section, we aimed to exclude any potential mixed motive, i.e. strategic considerations. Therefore, this game was played as a "one-shot", or static game.

Cooperation Game

In the third part of the experiment, subjects played a standard linear so called public good game (for an overview see Ledyard, 1995) with 2 players.[24] Subjects were randomly matched with a new counterparty. The following monetary payoff function (1) was carefully explained to the subjects, thereby providing several in-depth calculation examples in the instructions.[25]

$$\pi_i(g_1, g_2) = endowment - g_i + \alpha\,(g_1 + g_2) \tag{1}$$

The instructions described the public good neutrally as "the project" and we avoided the term "public good". For that reason, we will also refer to this game as the "Cooperation Game". The total contribution to the project is given by the sum of contributions $g_1 + g_2$. In our design, the marginal payoff from individual i's contribution to the project, $\frac{d\pi_i}{dg_i} = -1 + \alpha = -0,3$ is negative, but the social marginal benefits $\frac{d\sum \pi_i}{d\sum g_i} = -1 + 2\alpha = 0,4\ are$ positive. The payoff function is designed so that the Pareto optimum is defined by all participants contributing everything to the "project", while the dominant strategy for an individual subject is to contribute nothing.

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[23] Hence, action space in this game was continuous, and not as usual quasi-continuous, as subjects could decide to give any amount, and were not limited to giving in integer dollars. This was also decided on the basis, that an equal (50:50) split had to be made available to the subjects, which involved cent amounts in the 5 Euro endowment case. We deemed this crucial also for cross-sample comparison reasons.

[24] We decided on a two-player game, rather than a multi- player game as we wanted to minimize the coordination aspect and focus rather on the strategic aspect of cooperation, in line with our research question. In addition, while a public good game with two individuals is often argued to be like a classic Prisoners' dilemma game, the games are not identical. The voluntary contribution mechanism in the Public Good Game has a considerably larger strategy set than in the classic Prisoners' dilemma game with only two choices (defect/cooperate) (Isaac and Walker 1988).

[25] Thereby, the examples were constructed, ordered and written up in such a way that the possibility of subjects becoming anchored in their decision choice was minimized.

After reading-out the instructions, subjects had to answer six comprehension questions[26], thereby ensuring that all subjects clearly understood the procedure and the financial consequences of their choices. Once all participants had correctly completed the comprehension questions, they received further, more detailed, game-specific information, namely that several rounds of the game would be played and that their randomly assigned counterparty would remain the same for all rounds played. As we are interested in investigating inter-temporal, strategic choices, subjects played ten rounds of the public good game. After every round, subjects received feedback about (i) their counterparty's contribution, (ii) their own contribution and (iii) the consequently resulting (potential) profit from the respective round. Information in the context of voluntary contribution games allows subjects to engage in social comparison, whereby the behaviour of the counterparty serves as a reference point (Bazerman et al. 1992). This information is important when individuals strongly care about how their contribution compares to the contribution behaviour of the counterparty (Andreoni and Petrie, 2004).

We decided not to explicitly inform subjects about the exact number of rounds to be played - instructions simply informed that they would play "several rounds of the game" – as we wanted to avoid behaviour of strong iterated thinking. This arguably makes the situation more realistic (see Progrebna et al. 2011).[27] Finally, participants were informed that out of the "several" rounds played, one would randomly be drawn by the computer for compensation purposes at the end of the experiment. Again, none of the profits earned in current rounds could be accumulated or used in following rounds. [28]

Dictator Game 2

Once the public good game was completed, participants continued with part four of the experiment – the last game. Here, subjects played another one-shot dictator game, this time taking the opposite role as in the first dictator game (i.e. if they were the receiver in the first game they were allocated the dictator role in this part and vice versa if they were dictator in

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[26] Again, the questions were constructed, ordered and written up in a way that we believed would minimize the possibility of subjects becoming anchored in their decision choices.

[27] It could be argued that noise is generated within our data by not telling subjects about the exact number of rounds to be played, as subjects could potentially guess about the exact number of rounds to be played, creating endgame effects. However, as subjects were aware, that there would be more parts in the experiment (of which they had no detailed information, i.e. regarding their required time frames) we believe it was hard for them to estimate or make guess about this.

[28] We further decided not to elicit subjects' beliefs regarding the actions of the counterparty, as beliefs don't allow us to distinguish between free riders and distrustful conditional co-operators (i.e. those that contribute nothing AND believe the other will not contribute anything either and people that contribute nothing BECAUSE they believe others will contribute nothing (see Fischbacher and Gächter 2010).

the first part). The counterparty, however, was not the same as in Dictator Game 1 but was randomly matched anew by the computer. It was stressed in the instructions that the counterparty in this part would most likely not be the same person as in the previous parts. Again, students received 5 Euros endowment, while in the "entrepreneurial crowd" sample the dictator was endowed with 20 Euros in the high-stake treatment and 5 Euros in the low-stake treatment. Endowments and allocation choices were pay-out relevant. Subjects received feedback regarding the allocation decision at the end of the experiment (after the questionnaire, described below, was completed).

Stake Size

There is mixed evidence regarding the strategic effect of different stake sizes on players. While most studies found no difference in this regard[29] others found a negative correlation between stake size and contribution behaviour.[30] In Engel's (2011) meta-study on the Dictator Game, the author finds a significant negative effect on dictators' allocation decisions for high stakes. Camerer et al. (1999) deal with the literature of stake size within bargaining games and conclude that stake size within this context does not affect subject's average level of self-interest, but that higher stakes potentially decreases the variance of subjects' behaviour. Within this context, also risk aversion might play a significant role (however, this should be more the case in the Public Good Game as in the Dictator Game, as it is unclear how risk would factor into this non-strategic game). To control for stake size, we implemented our experiment at Berlin TOA with two average levels of pay-out, one corresponding to the stake size used in Hamburg and one equal to the stake size in the student sample.

Incentives

Subjects' total pay-out was determined by the previously described four parts at the very end of the experiment (after the questionnaire). Thereby, for the first part (Holt and Laury lottery) the computer randomly chose one of the ten lottery pairs relevant for pay-out. For the dictator game, subjects were paid out the money they decided to keep for themselves (when allocated

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[29] Forsythe et al. (1994) and List and Cherry (2008) in case of the Dictator Game. Hoffman, McCabe and Smith (1996) and Slonim and Roth (1998) using the Ultimatum Game. Carpenter, Verhoogen and Burks (2005), applying both the Dictator and Ultimatum Game. Fehr et al. (2002) for the gift-exchange game. Clark and Sefton (2001) for a sequential Prisoner's Dilemma game. Kocher et al. (2008) for a linear Public Good Game.

[30] Johannson-Stenman et al. 2005 in the trust game; Andersen et al. (2011) in the Ultimatum Game (however, it should be noted, that the stakes in this study were very high (some as high as an average annual income).

the role as dictator) and the money they potentially received (in the role of the receiver). Finally, as previously described, one of the ten rounds in the public good games was randomly selected for pay-out.

The experiment concluded with a questionnaire collecting additional (control) variables, which, based on the literature, might be important for understanding the behaviour during the games. Thereby, subjects first had to answer general demographic questions, followed by questions from the German socio-economic panel (SOEP) measuring trust. Next, participants answered questions eliciting personal values based on Schwartz's value theory (Schwartz, 1992). Finally, we measured entrepreneurial self-efficacy in the same manner as done in the study by Weitzel et al. (2010).

Data

Entrepreneurial/Professional subject pool

Across the two conferences, in total N=120 entrepreneurial subjects participated: n=46 from the ECFI in Hamburg (all high stakes) and n=74 from the TOA in Berlin (n=36 for the low stake and n=38 for the high-stake treatment). The sample's overall average age was 31.9 years (S.D. 6.61) and consists to 77 percent (n=92) of males. As we are particularly interested in the behaviour and decision-making of entrepreneurs, we split the entrepreneurial sample further into sub-samples of entrepreneurs (E) (n=77) and non-entrepreneurs (NE) (n=43)[31]. The gender ratio varies across these sub-populations: the male ratio amounts to 85 percent males in the entrepreneurial sample and 60 percent in the non-entrepreneurial sub-sample. While this ratio might appear unbalanced, in particular in the sub-sample of entrepreneurs, it is in fact reflective of the current gender ratio prevailing in the start-up industry. According to the German start-up monitor (2016), the ratio of female founders within the German start-up industry currently amounts to 13.9%. Correspondingly, the Diana Project [32] (2014), investigating the gender gap within the venture capital industry, finds that out of all US companies receiving venture capital only 15 percent had at least one woman on the executive team. If anything, one would have expected the gender bias to be even stronger in the high-

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[31] The non-entrepreneurial sample consists of e.g. employees of the start-up and technology industry (16.2%), consultants (14%), engineers/developers (12%), product managers (14%), creative artists (12 %), and students (12%).

[32] This project was funded by the Kauffman Foundation, the U.S. Small Business Administration, the National Women's Business Council, and the Swedish Institute for Small Business Research.

tech events we recruited our subjects at. Most subjects in our entrepreneurial sample grew up in Europe (84.2 Percent) and/or live there now (92.5 percent). The average working experience amounts to 4.3 years (S.D. 4.8) for the entrepreneurs and 5.3 years (S.D. 5.6) for the non-entrepreneurs.

Student subject pool

The average age of our (N=62) student subjects is 22.9 years. Thereby, females constitute 53.2 percent within this group. We recruited students exclusively from the faculty of economics and business.[33] Again, most subjects from this group (93.5%) grew up in Europe. In addition to the same trust (SOEP), value (WVS) and entrepreneurial self-efficacy questions, elicited in the professional group, we asked student subjects questions regarding their entrepreneurial intentions (EI). We measured this construct using a 5-item measure developed by Chen, Greene, and Crick (1998). Example items include "How interested are you in setting up your business" and "How likely is it that you will set up your own business in the near future." Responses to items were averaged to form an overall measure of entrepreneurial intention. Higher scores thereby represent greater levels of intentions.

Throughout the rest of this section, a considerable part of the analysis will focus on the factors of "group" and "stake size": Thereby, the professional sample is sub-divided into the groups of entrepreneurs (E) and non-entrepreneurs (NE), the student sample (S) constitutes the third level of the group factor. Stakes are based on the two levels of high (H) and low (L) stakes. The notation used in the following is summarized in table 1 below.

Table 16: Experimental Group Notations

	High-stakes	Low-stakes
Entrepreneurs	H-E	L-E
Non-Entrepreneurs	H-NE	L-NE
Students	n/a	L-S

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[33] Thereby, 50% studies economics, 35% are business students; 10% study a combination of economics and business, and about 5% major within statistical methods.

Psychometric Variables

We start our analysis by looking at the results of the psychometric scales. We thereby compare whether results on the respective scales are similar across all (sub) - group, or whether we find significant differences.[34]

Trust

Comparing the levels of the SOEP trust items between the sub-groups of our professional sample (E vs. NE), we find no significant differences on any of the trust items elicited.[35] [36] Comparing the (joined) professionals' (NE and E) trust levels to those of the student sample, we observe students to display significantly lower levels of trust on all three main items of the scale.[37] Table A1 in the Appendix summarizes the findings across groups for the trust measure. The table also compares our results to those obtained by Caliendo et al. (2012). In their study, the authors analysed, using SOEP data, the same set of trust questions across different employment states. Comparing the trust level of our entrepreneurial/professional crowd, to the group of self-employed individuals obtained by Caliendo et al. (2012), we observe higher levels of trust within our entrepreneurial sample on every item elicited.[38] This is worth noting, given the fact, that the authors report the self-employed to display significantly higher levels of trust in relation to those not being self-employed or employed at all. Our student sample, in contrast, is found between Caliendo's self-employed and our entrepreneurial crowd, leaning more towards the self-employed, meaning they are still more trusting than the average employee or unemployed person. The first impression here, however, is that students are not representative of entrepreneurs, professionals or of the general population when it comes to trust. This is not too surprising, as students live in a particular stage of their lives and experience can of course shape their attitudes in later life.

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[34] Although most of our psychometric variables are ordinal in nature, we treat them in our analysis as interval data and use mostly parametric analytics. Applying parametric test to ordinal data has widely been acknowledged as suitable for analysis (see Carifio and Perla, 2008; Lee and Soutar, 2010). However, we also use non-parametric tests, such as the Wilcoxon rank sum and Kruskall Wallis test to check for the robustness of the findings.

[35] Using both a t-test and the Wilcoxon rank-rum test.

[36] Thereby, it should to be stressed that our NE group does not really represent "employed" individuals in the broader sense. While not being self-employed, a large share of them actively engage with entrepreneurs and entrepreneurial venturing, and/or work in start-ups, creative or scientific organizations, partially at high managerial levels. This might be an explanation why we observe no differences between NE and E in this group.

[37] Note: we calculated an overall index of trust (termed trustscoremain), following the approach by Caliendo et al. (2012). The difference on the overall index is highly significant (p<0.000).

[38] But not testing statistically for significance.

World Values Survey

Based on the average ratings of the 6-point Likert scale, the entrepreneurs' ranking of the 10 values from highest to lowest is as follows: (1) Self-Direction, (2) Stimulation, (3) Benevolence, (4) Universalism, (5) Hedonism, (6) Achievement, (7) Conformity, (8) Power, (9) Security (10) Tradition. For the non-entrepreneurs, the ordering of ranks is very similar: (1) Self-Direction, (2) Benevolence, (3) Universalism, (4) Hedonism (5) Stimulation (6) Achievement, (7) Conformity, (8) Security, (9) Power and (10) Tradition. Comparing the individual values between the two groups, we find, applying univariate analyses, (marginally) statistically significant differences on the values of self-direction (p=0.02)[39] and power (p=0.07). However, when additionally controlling for gender, the effect disappears for the variable of power.[40] . The finding seems sensible, given that the defining objective of self-direction presents independent thought and action, such as choosing own goals and being creative (Schwartz, 1992). Entrepreneurship research has well documented the need of entrepreneurs to act independent and autonomous (e.g. Carland et al. 1984). The similar ratings on the remaining items could be driven by the fact that this sample of professionals, works in very similar environments and therefore value similar aspects. We know for example that jobs within start-ups are not as secure as in other industries (Van Praag and Versloot, 2007), it consequently takes individuals, placing less value on job security to work for these young companies. At the same time, these young companies often provide stimulating environments, where allowed or even encouraged to think "outside the box", where employees are less confronted with conformity rules (i.e. dress codes), but enjoy the flexibility and oftentimes low hierarchy structures of these companies.

Comparing the entrepreneurial (both E and NE joined) and student sample in relation to their value scores, we find the two groups to significantly differ on the values of self-direction ($M_{prof.}$= 5.4; $M_{student}$= 4.4 ; p=0.00), security ($M_{prof.}$= 2.83; $M_{student}$= 3.69 ; p=0.00), tradition ($M_{prof.}$= 2.3; $M_{student}$= 2.9 ; p=0.01) and conformity ($M_{prof.}$= 3.5; $M_{student}$= 4.0 ; p=0.01). The direction of differences makes thereby sense: security and, tradition and conformity are of less relevance within the entrepreneurs' value system, reflecting the generally disruptive, uncertain and innovative aspects of the entrepreneurial environment. At the same time, self-direction seems to be an essential and highly valued aspect for the group

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[39] The non-parametric Wilcoxon rank sum test confirms the difference on the Self-Direction variable (p=0.01) between E and NE.

[40] In line with research, we find males to rate the value of "Power" significantly higher than females (p=0.025).

of entrepreneurial professionals, in particular the entrepreneurs. Detailed results of the outcome between the groups can be obtained from the Appendix.[41]

Entrepreneurial Self-Efficacy

Weitzel et al (2010) find individuals to differ significantly in their contribution behaviour towards others, based on their *type* of entrepreneurial self-efficacy (i.e. business vs. creative talent). Consequently, we control for these aspects in our experimental design. For measuring entrepreneurial self-efficacy, we collect the same items as done in their research paper (based on Wilson et al. 2007, Zhao et al. 2005, and Monsen[42]). In total 12 items are collected, (please refer to the Appendix for the listing and wording of the items). On a seven-point Likert-scale, subjects had to rate their confidence regarding their ability to perform creative or business tasks (i.e. ability to be creative; ability to manage money, etc.) *relative* to their peers. For validation purposes, we run a principal factor analysis, producing two factors with eigenvalues close to (0.93) or above 1. In line with Weitzel et al. (2010) and other past research (see Danziger et al., 2008; Chen et al., 1998; Long, 1983), proposing managerial talent and creativity to be distinct constructs, we find the two factors to load on creative and business scales respectively (i.e. creativity factors load highly negative on the second factor). Next, we run principal factor analysis on the 10-business talent (BT) items of the self-efficacy scale and find only one factor with an eigenvalue above 1. We consequently split the business and creativity items into two distinct factors: Creative talent (CT) (2 items, α=0.87) and Business Talent (BT) (10 items, α=0.82)[43]. These two factors will later be employed for testing their respective impact on contribution behaviour, to compare the results to those of Weitzel et al. (2010).

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[41] Note: The parametric (t-test) and non-parametric tests give the same results in terms of significance. An exception is on the item of universalism, where we find a sig. difference when looking at the Wilcoxon test (p=0.04) but not the t-test (p=0.16). Professionals score thereby higher than the students. While we do keep the finding in mind, we do not want to over interpret it, as we consider the aspect of other-regarding preferences – which universalism has been linked to- in more detail at a later stage of the report.

[42] The items by Monsen were suggested verbally during the study (see Weitzel et al, 2010 for details).

[43] Whereby the ability to manage money presents a reversed item – also in the study by Weitzel et al. This item is an item with weak loadings.

Figure 7: Mean values of entrepreneurial self-efficacy (12 items) by group.
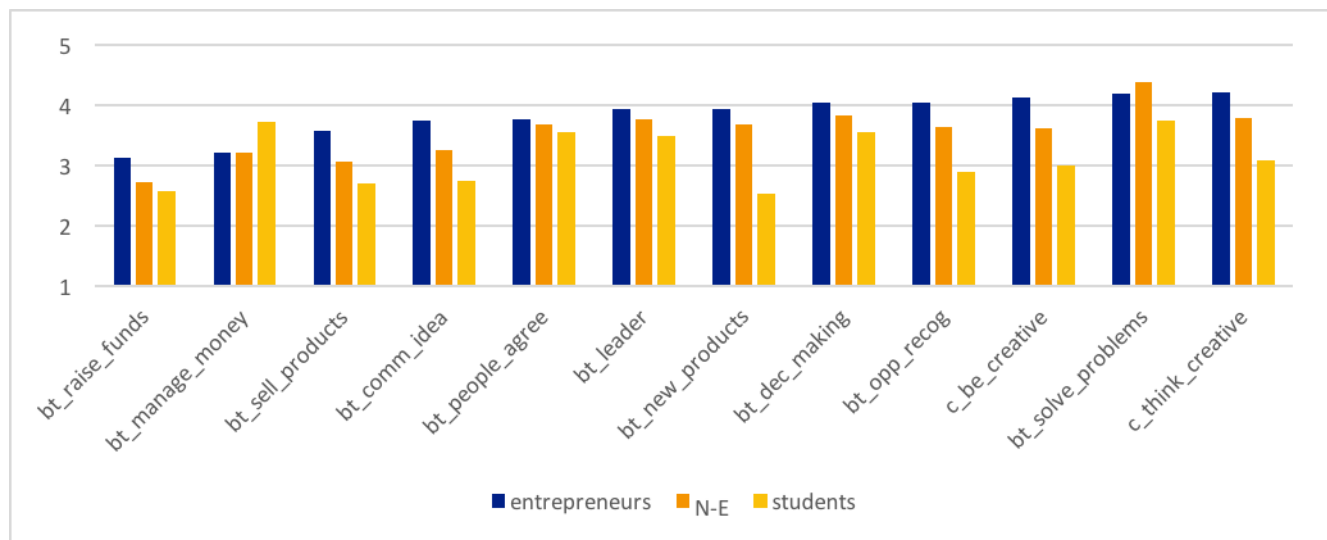
Figure 1 above shows the mean scores of the self-efficacy items for the professional crowd (separately for entrepreneurs and non-entrepreneurs) as well as the student sample. Thereby, the order of skills represents the ability ranking of the entrepreneurs, i.e. on average, they regard their ability (in comparison to their peers) lowest on the item of "raising funds" (M= 3.1) and highest on "thinking creative" (M= 4.2). Entrepreneurs' (E) ratings are the highest on almost every item of the scale higher, except on the item of "problem solving" (where NE score marginally higher) and "managing money"[44] (where students rate themselves higher than both E and NE). These findings are not surprising, given that the scale reflects *entrepreneurial* self-efficacy. We apply a Kruskal-Wallis equality-of-population rank test, to check whether the results differ across the three groups (E, NE and S). We find, except for the item "get people to agree with you" (p=0.53), the tests to be (highly) significant on all other items.[45]

Running the analysis separately for the BT and CT items (based on the results of the factor analysis) with the professional sample, we find significant differences on the average rating of the 10 BT items between entrepreneurs M_E=3.76 and non-entrepreneurs M_{NE}=3.53 (p= 0.02) and highly significant differences on the CT scale (p<0.01).[46] Looking at the individual items, we find highly significant differences (p<0.01) on both individual items of the creative factor (CT). Entrepreneurs regard their creative abilities in relation to their peers' as

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[44] Note: this item is a reversed item in the internal reliability analysis.
[45] No p value exceeds >0.02; For a summary of the results check the Appendix
[46] The two-sample t-test and Mann Whitney U test give identical results.

significantly better than their non-entrepreneurial counterparts. [47] We also find some significant differences on the individual business talent items:[48] In particular in skill-sets strongly related to business venturing, such as identifying opportunities, raising funding, commercializing ideas and selling products entrepreneurs consider their skills more superior (in relation to their peers) in comparison to the NE group.[49]

An additional explanation for observing the consistently higher ratings of the entrepreneurs on this scale (especially on items less related to exclusively entrepreneurship but business in general), might relate to the fact that entrepreneurs have been shown to exhibit inflated levels of confidence (Köllinger et al. 2007).[50]

Conferences

Before analysing the "games section" of our experiment, we checked if the data of the two conferences could be merged. We thereby compared the behaviour of both dictator games, as well as the first round of the public good game. The first round of the public good game is analysed separately from the other rounds of the game, as it constitutes an initial condition to cooperation (first-period play) and is unrelated to any learning (they may at best guess what the counterparty will do). As only the high-stake treatment was carried out at the ECFI, we applied also only the high-stake data from the TOA in this analysis to avoid any potential confounding effects in relation to treatment size and conference type.

Results of all games show, using a Wilcoxon rank sum test, no significant differences in the contribution behaviours of the ECFI and the TOA (Results for DG1: M=6.89, S.D.=3.34 and M=6.8, S.D.=3.95 respectively; z= 0.13, p=0.89. Results for DG 2: M=8.01, S.D.=6.41 and M=7.22, S.D.= 3.81 respectively; z=0.367; p=0.71. Results Public Good Game: M=14.39,

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[47] (M=4.2 (S.D.=0.108) vs. M=3.8 (S.D. =0.100); p=0.005 for the item of "thinking creative"; M=4.1 (S.D. =0.108) vs. M=3.6 (S.D.=0.128), p=0.003 for the item „being creative").

[48] On some of the BT no (significant) differences are observable across the groups of entrepreneurs and non-entrepreneurs (i.e. on the items ability to solve problems, manage money, get people to agree with you, being a leader, make decisions and create new products no differences are found).

[49] Opportunity recognition: E: M=4.05 (S.D. = 0.101) vs. NE: M=3.65 (S.D. =0.140); p=0.02. Fund raising: E: M=3.1 (S.D. =0.123) vs. NE: M=2.72 (S.D. =0.153); p=0.04. Commercializing ideas: E: M=3.7 (S.D. =0.118) vs. NE: M=3.25 (S.D. =0.141); p<0.01. Selling products: E: M=3.57 (S.D. = 0.14) vs. NE: M=3.07 (S.D. =0.15); p=0.01.

[50] Comparing the results to Weitzel et al. (2010) we find, that the student population rated themselves even higher than our entrepreneurial sample, in relation to BT and CT. We presume that this might be driven by the fact that the questions ask to compare yourself to your peers, and that the comparison to other professionals within the same industry and fellow students, who might not even study in a business-related field, could drive this difference.

S.D. = 5.83 and M=12.21, S.D. = 6.55 respectively; p=0.13).[51] We consequently merge the data across the conferences and proceed with the analysis.

Results Dictator Game 1 and Dictator Game 2

In this section, we describe the results between factors, stake and group types, for the first (DG1) and second (DG2) dictator game, separately. As we join the low and high stake data in the following, we run the analysis on the variable of contribution to the receiver as percentage of total endowment.

Starting with the first dictator game, we run a Kruskall-Wallis equality of populations rank test between the three groups (E, NE and students) confirming the groups to differ from each other (p=0.02 for both stakes, p=0.01 for low stakes) in relation to their donation behaviour.

Table 17: Summary Statistics Dictator Game 1

Dictator Game 1						
Allocation (in % of endowment) of dictator to receiver.						
	Obs	Mean	Std. Dev.	Min	Max	Wilcoxon Rank Sum Test
E	35	38.31%	17.54%	0	0.6	z=1.859; p=0.06
NE	25	31.60%	19.13%	0	0.75	
H-E	23	34.65%	17.95%	0	0.5	z=0.6 ; p=0.54
H-NE	18	33.89%	18.28%	0	0.75	
L-E	12	45.33%	15.00%	0	0.6	z=2.154; p=0.03
L-NE	7	25.71%	21.49%	0	0.5	
Students	32	26.38%	24.72%	0	0.98	

In a next step, we more closely investigate the differences between the individual groups. Table 2 summarizes the results of the individual groups' allocation behaviour. Comparing the two sub-groups of our professional sample, using Wilcoxon rank sum tests, we find entrepreneurs to allocate overall more to the receiver than the non-entrepreneurs (M_E=38.31%; M_{NE}= 31.60%; z=1.86, p=0.06). However, this difference is driven by a large divergence of the groups' contribution behaviour in the low stake case: Entrepreneurs allocate about 20% more of their endowment to the receiver than the NE group in this scenario (z=2.15, p=0.03). Due to the small number of observations driving this result (n=19), we

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[51] Using simple regression analysis, with contributions made to the receiver as the dependent variable, and controlling in addition to conference type also for group type (dummy variable termed entrepreneur) and gender, we find no significant relationship between the contribution behaviour and conference type for both dictator games and the contribution behaviour in the public good game.

refrain from placing a too strong emphasis on the potential meaning of these findings[52]. Looking at the high-stake treatment (n=41), we see entrepreneurs and non-entrepreneurs to allocate very similar amounts to the receiver (M_F=34.65%; M_{NE}= 33.89%; z=0.6, p=0.54). Consequently, we are unable to make definite statements as to whether the behaviour of these two groups differ in the DG1. While we do see entrepreneurs to behave at least as generous as NE in the DG1, the variation of behaviour in relation to stake size is something that needs to be investigated in more detail in future research.

Comparing the donation behaviour of entrepreneurs and students (E vs. S), we find entrepreneurs to allocate significant more money to the receiver, regardless of stake size, using a Wilcoxon rank sum tests (z=2.61, p=0.01 for both stakes; z=3.00, p=0.003 for low stakes). On average entrepreneurs allocate about 10 percent more of their endowment to their counterparty than the student sample (M_F=38.31%; $M_{Students}$= 26.38 %).[53]

To confirm the above outlined results, we run tobit regressions (censored at zero), with the dependent variable presenting the allocation (as % of the endowment) to the receiver, controlling additionally for gender and stake size.[54] Results confirm the above outlined results (please refer to the Appendix for the exact results of the regressions). While we find males to generally allocate less to the receiver than their female counterparts[55], the stake size dummy is insignificant.

Moving to the results of the second Dictator Game (DG2), we run a Kruskall-Wallis equality of populations rank test between the three groups (E, NE and students), confirming again that the three groups differ from each other in relation to their allocation choices (p=0.000 for both stakes, p=0.007 for low stakes). Table 3 below summarizes allocation choice statistics by groups.

The behaviour in the second dictator game is in many ways like the behaviour observed in the first Dictator Game (DG1), including the somewhat hard to interpret findings in case of low stake sizes. In the high-stake treatment, entrepreneurs and non-entrepreneurs again allocate very similar amounts towards their counterparty (M_F=38.03%; M_{NE}=39.44%; z=0.148,

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[52] Note: We did not expect such a change in behaviour due to stake size. Further research needs to establish whether the observed profound changes due to sample size can be replicated, and potential reasons underlying this.

[53] We also join the professional sample (NE and E) and compare their contribution behaviour to the students. Again, results show that students behave different to the professional crowd, by allocating significantly less ((z=2.17, p=0.03 for both stakes; z=2.28, p=0.02 for low stakes).

[54] We also run the regressions separately for respective stake sizes, where applicable.

[55] Only in the regression, run separately for the dummy E vs. NE in the high stake scenario we obtain a gender dummy coefficient of zero.

p=0.88). In comparison to the contributions in the first Dictator Game (concerning the high-stake treatment only), contributions increased by about 10 percent for the entrepreneurs and 15 percent for the non-entrepreneurs.

Table 18: Summary Statistics Dictator Game 2

Dictator Game 2						
Allocation (in % of endowment) of Dictator to Receiver						
	Obs	Mean	Std. Dev.	Min	Max	Wilcoxon Rank Sum
E	42	35.05%	25.37%	0	1	z=0.409; p=0.68
NE	18	42.28%	28.84%	0	1	
H-E	32	38.03%	25.51%	0	1	z=0.148; p=0.88
H-NE	9	39.44%	33.11%	0	1	
L-E	10	25.50%	23.62%	0	0.5	z=1.377; p=0.16
L-NE	9	45.11%	25.56%	0	1	
Students	32	14.92%	19.10%	0	0.5	

In the low stake treatment, we have, as in DG1, a notable, albeit statistically insignificant[56], difference between the allocation behaviour of E and NE (M_E=25.50%; M_{NE}=45.11%; z=1.38, p=0.16). Remarkably, the tendency of contributions in relation to DG1 has changed in reversed ways: While entrepreneurs give about 44 percent less in relation to DG1, NE increased their relative contributions by 44 percent from DG1 to DG2. Again, confirmation of these results via larger sample sizes would be needed to allow for a sensible and reliable interpretation of these results. One potential reason of observing this reversed behaviour could be the experience subjects made while playing the public good game, and this consequently affecting their allocation choices in DG2. We discuss the possibility of this in more detail, after presenting the results of the public good game. However, it is unclear why this should prevail only in the high stake and not in the low stake case. As we did not design our experiment anticipating this finding, we cannot explain this remarkable result.

Comparing the allocation behaviour of the entrepreneurs in DG2 to the students', we observe, in line with the results of DG1, students to allocate significantly lower amounts (M_E=35.05%; $M_{Students}$= 14.92 %; z=3.46, p=0.000).[57] The Tobit regressions, performed in the same manner as for DG1, again confirm the above results.

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[56] Most likely due to sample size.

[57] Again, results show that students behave also different to the professional crowd (E and NE), by allocating significantly less ((z=3.96, p=0.000 for both stakes; z=2.81, p=0.005 for low stakes).

To test the validity of using individuals (in particular, business and economics students) scoring high on entrepreneurial intent as a proxy for entrepreneurs (or reflecting entrepreneurial behaviour), we run regressions separately with the students, controlling for the impact of entrepreneurial intent and self-efficacy (as a construct overall and split into business and creative talent). The results are shown in table 4 below (for DG1 and DG2 together). We find neither entrepreneurial intent nor entrepreneurial self-efficacy to play a significant role in explaining students' allocation behaviours in the dictator games.

Table 4: Tobit regressions DG 1 and DG 2: Student sample only

Individual contributions (as % of endowment): tobit regressions for % of endowment send to the receiver

Variable	Dictator Game 1 (DG1)		Dictator Game (DG2)	
	Student sample		Student sample	
	Self Efficacy	BT & CT	Self Efficacy	BT & CT
Male	-0.223	-0.201	-0.203*	-0.195*
	(0.133)	(0.139)	(0.109)	(0.107)
Entrepreneurial Intent	-0.0375	-0.0333	0.172**	0.158**
	(0.0605)	(0.0611)	(0.0692)	(0.0704)
Entrepreneurial Self-Efficacy	-0.0941	-	-0.0652	-
	(0.144)		(0.100)	
Business Talent (BT)	-	0.0330		0.0385
		(0.0965)		(0.0703)
Creative Talent	-	-0.116		-0.0874
		(0.140)		(0.0934)
Constant	0.662	0.596	-0.0346	-0.0386
	(0.407)	(0.425)	(0.297)	(0.291)
Sigma	0.332***	0.332***	0.261***	0.257***
	(0.0578)	(0.0579)	(0.0512)	(0.0504)
Number of individuals	32	32	31	31
Log Likelihood	-16.12	-15.98	-10.96	-10.70
LR χ2	5.51	5.49	8.99	9.51
(Prob.>χ2)	0.16	0.24	0.03	0.05
Obs. censored at zero	12	12	15	15

Standard errors in parentheses

p<.1, ** p<.05, *** p<.01

Running the regression separately for the two DGs (see tables 13 and 14 in the Appendix), we find entrepreneurial intent has a significant positive influence on the contribution behaviour in DG 2 (β= 0.17, p=0.019), while entrepreneurial self-efficacy (also when split into the factors of BT and CT) still has no impact on the contribution levels as suggested by the results of Weitzel et al. (2010) and Urbig et al. (2012).

Results Cooperation Game

Figure 2 below shows the average contribution behaviour per round for the three groups respectively. When looking at subjects' contribution levels in the public good game, we observe generally similar contribution trends over time in relation to past public good game research. Usual contribution levels from past research amount to approximately 50% of the endowment (see e.g. Cookson, 2000; Croson, 1996 and Andreoni, 1988) and then decline over the periods of play. We observe (very) high initial contribution levels within our professional sample, starting between 55 % in the H-NE group, 65% for L-E, and 73 % in both the L-NE and H-E groups[58]. From the first to the last round, contributions decline between 14% (L-E) and 24% (L-NE), in line with past research (Isaac and Walker, 1988; Ledyard, 1995, Andreoni, 1988, Fehr and Gächter, 2000). However, due to the high initial levels of cooperation, we also end up with high *average* contributions of 49% in the last round (52% for entrepreneurs; 45% for non-entrepreneurs) – this is in comparison to e.g. 18.1 % in Andreoni and Petrie (2004) and 10.6 % in Croson (1996). While the student sample starts with a lower average contribution levels ($M_{students(Rd.1)}$=54.22%) in comparison to the professional sample, the level declines by only 6 percentage points across the 10 rounds to $M_{students(Rd.10)}$= 47.8%, higher than for the NE group ($M_{NE(Rd.10)}$=43.7%). None of our treatments thus drops to complete free riding. We observe entrepreneurs to make consistently higher allocation choices in comparison to the students and NE of the professional crowd.

Figure 8: Average contribution to the project by round and group

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[58] The average contribution across all rounds varies between 48% (L-NE) and 61% (L-E). In comparison to past research, these contribution levels are noticeably high (e.g. 44.07% Andreoni 1995; 30.3% Andreoni and Petrie, 2004; 33.2 % for Andreoni, 1988, 35.7 % Croson 1996). Figure 3 in the Appendix summarized the average contribution levels of the professional sample by group (E vs. NE) and stake size.

Overall, we see entrepreneurs to allocate on average M_F=59.22% of their endowment, while non-entrepreneurs allocate M_{NF}= 47.77 % to the joint project. This difference is significant using a Wilcoxon Rank sum test (2.171; p=0.03). Random-effects Tobit regressions confirm the result of entrepreneurs' higher contribution levels to the project (β=0.24, p=0.025) while controlling for stake size (p=0.844), gender[59] and a proxy for conditional cooperation[60] (β=0.561, p=0.000).

Comparing entrepreneurs' average contribution level to that of the student sample ($M_{Student}$= 47.47%), we find entrepreneurs to allocate significantly more of their endowment to the project (p=0.05; z=2.00), while students do not differ in their behaviour in relation to the NE group (p=0.83; z=0.124).

To get a better understanding of our sample and their respective cooperative behaviour, we classify subjects' behaviour based on their initial level of contribution, given by their contribution in the first round of the cooperation game. Classification regarding cooperative dispositions has been suggested as useful. Andreoni (1995) for example argues that the regularly observed decline of contributions over multiple rounds in the public good game is due to co-operators becoming discouraged by their free riding counterparties. Kurzban and Houser (2005) divide their subjects into co-operators, free-riders and reciprocators, based on their endowment proportion contributed to the pool, and their reaction to their co-players contributions. Their findings suggest stable individual differences in cooperative dispositions. Thereby, it should be noted that the literature does not provide a clearly defined theoretical cut-off point determining whether an individual classifies as free rider or co-operator. Hence, splitting our sample into such types of group classifications involves some degree of arbitrariness. We follow the approach of Isaac and Walker (1988) and classify someone as a "co-operator", if the contribution in the first round of the cooperation game exceeds 33 percent of the endowment; otherwise, (contributing 33 percent or less) subjects are classified as "free rider". A similar approach has been used by Gunnthorsdottir (2007) – where the cut-off value was set at 30 percent.[61]

Table 5 below shows the distribution of the types across our group factor.[62] The chi-squared test for difference in distributions between the groups is significant (p= 0.05). Findings show that we have more free riders in the sub-group of non-entrepreneurs and students, and more

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[59] While males contribute less, the coefficient is insignificant p=0.38
[60] Conditional cooperation is measured by the counterparty's contribution level in t-1.
[61] Similar results are obtained using this method (Chi-Squared test, p=0.05)
[62] Values "below" are expected values based on the null hypotheses of Pearson's Chi-squared test.

entrepreneurs in the "co-operator" classification. Again, this confirms our previous analyses of identifying the group of entrepreneurs as more cooperative within the game.

Table 19: Classification of subjects into Co-operators and Free riders by Group and Results of Chi Square test.

	Entrepreneurs (E)	Professionals (NE)	Students	Total
Freerider (n)	10	12	17	39
(expected frequency)	16.5	9.2	13.3	39
Cooperator (n)	67	31	45	143
(expected frequency)	60.5	33.8	48.7	143
Total	77	43	62	182
Pearson chi2(1) = 5.65	p=0.05			
Fisher's exact	p=0.05			

Running regressions on the student sample only (see Table 6 below) to evaluate the influence of entrepreneurial intent and self-efficacy on the contribution behaviour in the cooperation game (in the same way as performed for DG 1 and DG2), we find the coefficient of entrepreneurial intent to be negative (contradicting the results we obtained for the entrepreneur (E) sample) and insignificant (β=-0.04, p=0.16).

Table 20: Tobit random effects panel regression data – Cooperation Game, Student sample only

Individual contributions (as % of endowment contributed to the project): Tobit random effects panel regressions

Variable	Student sample	
	Self-Efficacy	BT and CT
Conditional Cooperation	0.787***	0.783***
	(0.0936)	(0.0932)
Male	-0.0121	0.0294
	(0.204)	(0.205)
Entrepreneurial Intent	-0.0736	-0.0833
	(0.106)	(0.106)
Entrepreneurial Self-Efficacy	0.137	-
	(0.209)	
Business Talent (BT)	-	0.0250
		(0.191)
Creative Talent	-	0.157
		(0.131)
Constant	-0.133	-0.251
	(0.598)	(0.602)
Number of observations	589	589
Obs. censored at 0	206	206
Obs. censored at 1	178.00	178.00
Log Likelihood	-284.97	-284.43
Wald χ^2	71.48	73.51
(Prob.>χ^2)	0.00	0.00
Error Components:		
σ_u	0.737	0.728
σ_e	0.351	0.3513
ρ	0.8148	0.811

Standard errors in parentheses
p<.1, ** p<.05, *** p<.01

Also, in line with the findings of both dictator games, the coefficient of entrepreneurial self-efficacy is not significant (p=0.21) (also when split into the constructs of BT (p=0.19) and CT (p=0.13)).

Discussion

Overall our results implementing SCALE in three distinct German subject pools, we tentatively conclude that entrepreneurs are more inclined to co-operate. This result is less pronounced in the sharing in our dictator games. It should be noted, however, that these games are one-shot games, giving us one observation per subject only. Given this small number of observations, we do not want to draw strong conclusions from these results. Unexpected and harder to make sense of are the findings in relation to varying stake size within the dictator game. While past research has investigated stake sizes in relation to contribution behaviour, our findings imply that stake sizes might matter more than expected in this regard. As we did not anticipate this finding and did not design the experiment to help us identify exactly what might have caused this behaviour, this is something future research needs to explore in more detail.

Comparing Entrepreneurs to non-entrepreneurs in our subject pool already suggests entrepreneurs are more socially oriented. We should add that in our subject pool this is a conservative test, as we recruited the non-entrepreneurs at the same entrepreneurial events and they are decidedly not representative of the general population. Our non-entrepreneurs are typically professionals working intensively with entrepreneurs and likely to be socialized as they are. They are part of the same entrepreneurial start-up scene, even if they have not founded their own business. On the few dimensions that we could compare them to e.g. employees and unemployed people, they were indeed closer to entrepreneurs. This calls for implementation of the SCALE-experiment in other groups of subjects in future research.

Comparing our student to the entrepreneurial sample, we conclude that entrepreneurial intent (EI) does not give us stable conclusions in relation to the observed behaviour of entrepreneurs. This has significant implications for experimental economics as a field, where student subjects with high entrepreneurial intentions are sometimes taken as a good proxy for entrepreneurs. Our experiment shows this may lead to misguided conclusions. Specifically, our results show the actual entrepreneurs are in fact more sharing and cooperative than the student sample.

While the results in this regard gave us consistent findings in the second dictator game (DG2), namely that students scoring higher on EI also made higher allocation choices to the receiver - as was also observed for the group of entrepreneurs – the findings in DG1 and the cooperation game established no relationship between EI and contribution/allocation behaviours.

4. Discussion and Conclusion

We concluded from our literature review that the propensity of firms to behave in a socially responsible way is likely to depend to at least some extent on the moral attitudes of the founder(s) and may have strong and long-lasting effects through their proven impact on the corporate cultures of the firms they found. Consequently, it is important to investigate the primitive moral and ethical attitudes of firm founders. In the SCALE-experiment we designed and conducted at two different entrepreneurial startup events in Germany, we recruited entrepreneurs and non-entrepreneurs to participate in a simple, but properly incentivized experiment consisting of two dictator games and a ten-round cooperation game. The results are encouraging. We find that entrepreneurs are more generous in dictator games than non-entrepreneurs when they play the game as dictators first. Interestingly, the results flip when they play the game as dictator after the cooperation game. As our "non-entrepreneurs" are people that hang out with entrepreneurs and startups and should be considered part of their ecosystem, however, we do not want to over-interpret this result. That group is perhaps not the most ideal control group as they look more like entrepreneurs than employees when comparing them to characteristics observed in Caliando et al. (2012). Therefore, we implemented the SCALE-experiment also with a group of students. If our subject pool of economic and business students is a good proxy for future professional managers, this provides us with perhaps a more interesting reference group. Although we find that students and entrepreneurs are not significantly different in their contributions to the cooperation game in general, we do find a positive and significant effect of (self-assessed) Entrepreneurial Creative Skills. That is, more creative students and entrepreneurs both seem more inclined to cooperate. These results are much too preliminary to claim policy relevance. But as these results mimic earlier findings in different settings we can tentatively suggest that institutions should enable and promote *creative* entrepreneurs as opposed to business talent driven entrepreneurship. Given that most of the current entrepreneurship and startup policies and programs do not distinguish between founders on that dimension, it may well be that such programs support would be super entrepreneurs as well as Baumol's (1991) destructive entrepreneurs. Following Baumol (1991) the art is to design institutions is such a way that it is the creative, productive entrepreneurs that can gain access to the labor, knowledge and finance they need. Our results suggest that these are also the more cooperative and giving people.

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Appendix

Experimental Design: Questionnaire – Scale and item descriptions.

Subjects were asked to rate on 6 point Likert scale whether item's description is: 1 ('not at all like me') to 6 ('very much like me')

Value	WVS Item	Defining Goal (Schwartz, 2012 (p.5)
Universalism	Looking after the environment is important to this person; to care for nature.	Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.
Benevolence	It is important to this person to help the people nearby; to care for their well-being.	Preserving and enhancing the welfare of those with whom one is in frequent personal contact (the 'in-group').
Conformity	It is important to this person to always behave properly; to avoid doing anything people would say is wrong.	Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms.
Tradition	Tradition is important to this person; to follow the customs handed down by one's region or family.	Respect, commitment, and acceptance of the customs and ideas that one's culture or religion provides.
Security	Living in secure surroundings is important to this person; to avoid anything that might be dangerous.	Safety, harmony, and stability of society, of relationships, and of self.
Power	It is important to this person to be rich; to have a lot of money and expensive things.	Social status and prestige, control or dominance over people and resources.
Achievement	Being very successful is important to this person; to have people recognize one's achievements.	Personal success through demonstrating competence according to social standards
Hedonism	It is important to this person to have a good time; to "spoil" oneself.	Pleasure or sensuous gratification for oneself.
Stimulation	Adventure and taking risks are important to this person; to have an exciting life.	Excitement, novelty, and challenge in life.
Self-Direction	It is important to this person to think up new ideas and be creative; to do things one's own way.	Independent thought and action--choosing, creating, exploring.

Subjects were asked to rate their abilities in comparison to their peers on 5 point likert scale for the given items (1 = a lot worse; 5 = much better).

Item description	Source	Factor and Variable Name
solve problems	Wilson et al. 2007	bt_solve_problems
manage money	Wilson et al. 2008	bt_manage_money
be creative	Wilson et al. 2009	c_be_creative
get people to agree with you	Wilson et al. 2010	bt_people_agree
be a leader	Wilson et al. 2011	bt_leader
make decisions	Wilson et al. 2012	bt_dec_making
successfully identify new business opportunities	Zhao et al. 2005	bt_opp_recog
create new products	Zhao et al. 2006	bt_new_products
think creatively	Zhao et al. 2007	c_think_creative
commercialize an idea or new development	Zhao et al. 2008	bt_comm_idea
raise funds for a new business	Monsen / Weitzel et al. 2010)	bt_raise_funds
sell a new idea or service	Monsen / Weitzel et al. 2010)	bt_sell_products

Table 23: Trust (SOEP)

Subjects were asked to rate the following statements.

Item description	Variable Name (as found in Caliendo et al. 2010)
Main items: 4 point Likert Scale (1 = totally agree ; 4 = totally disagree)	
On the whole one can trust people (reversed item)	trustpeople
Nowadays one can't rely on anyone	canttrust
If one is dealing with stranger, it is better to be careful before you trust them	cautionstrangers
Supplementary Items (1) : 0=no (trust) ; 1 = yes (trust)	
Do you believe that most people would exploit you if they had the opportunity *(dfair=0)*, or would attempt to be fair toward you *(dfair=1)*?	dfair
Would you say that for most of the time, people attempt to be helpful *(dhelpful=1)*? Or only act in their own interests *(dhelpful=0)*?	dhelpful
Have you ever profited from the generosity of a person, who you had not previously met *(dprofitfromstranger=1; otherwise =0)*?	dprofitfromstranger
What would you say: how may close friends do you have? *(open scale question)*	numberfriends
Supplementary Items (2): 5 point Likert Scale (1 = very often ; 5 = never) **How often does it occur that…**	
…that you lend your friends your personal belongings (i.e. CDs, books, car, bicycle)?	lendbelongings
…that you lend your friends money?	lendmoney
…that you leave the door to your apartment unlocked?	doorunlocked

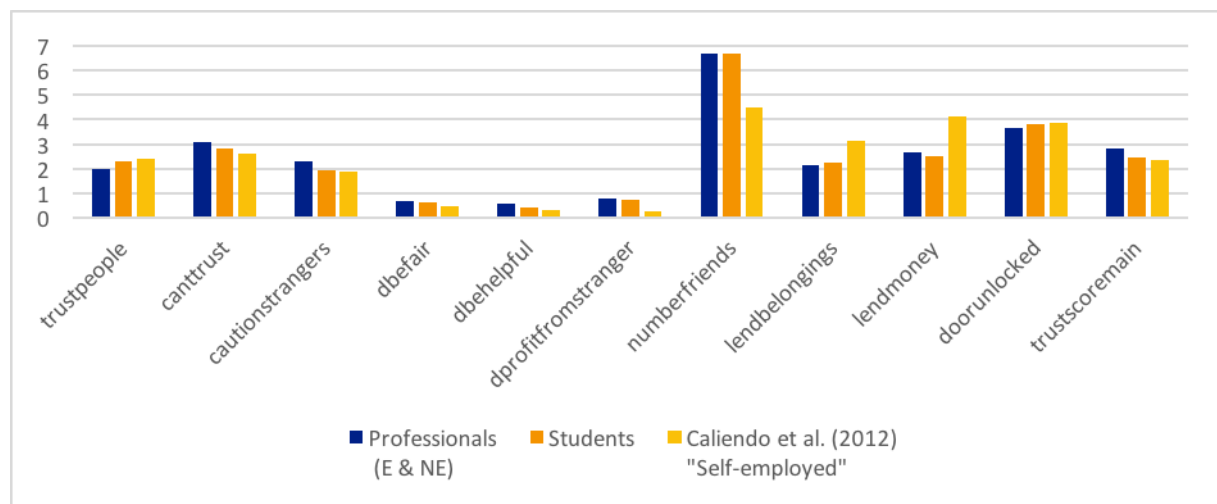*Figure 9: SOEP mean trust score values by group*

Table 24: Trust - mean values by group. Parametric and non-parametric test results

Variable	Professionals (E and NE)	Students	Caliendo et al. (2012) "Self-employed"	Wilcoxon Rank Sum test (Professionals vs. Students): p-values	t-test (Professionals vs. Students): p-values
trustpeople	1.97	2.31	2.39	0.002	0.000
canttrust	3.08	2.82	2.63	0.027	0.033
cautionstrangers	2.33	1.92	1.89	0.001	0.001
dbefair	0.68	0.61	0.48	0.405	0.414
dbehelpful	0.59	0.40	0.31	0.016	0.016
dprofitfromstranger	0.80	0.74	0.26	0.371	0.388
numberfriends	6.72	6.71	4.47	0.597	0.991
lendbelongings	2.16	2.23	3.14	0.870	0.661
lendmoney	2.68	2.53	4.11	0.332	0.336
doorunlocked	3.64	3.81	3.87	0.432	0.477
trustscoremain	2.81	2.48	2.37	0.000	0.000

Figure 10: World Values Survey – mean values by entrepreneurs and non-entrepreneurs
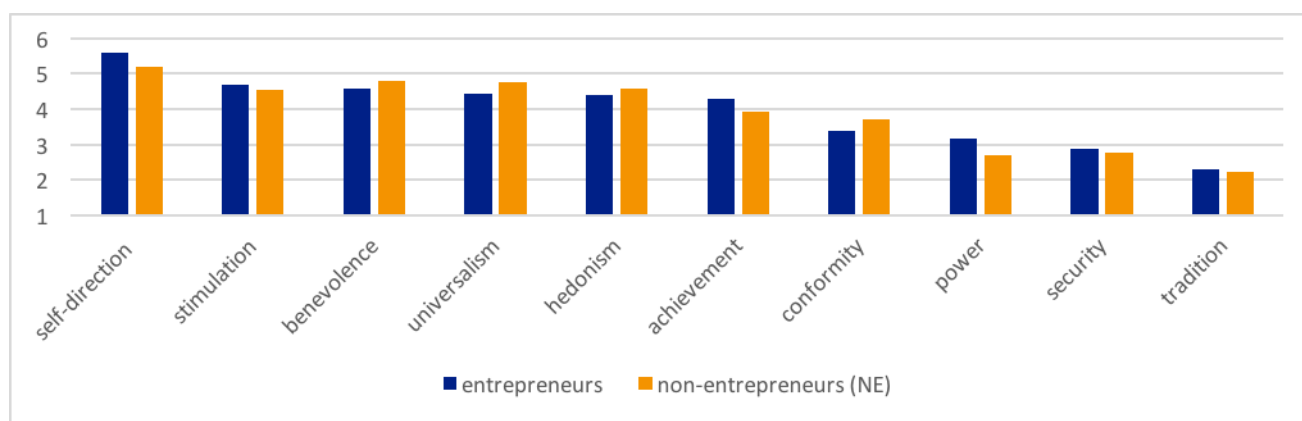

Figure 11: World Values Survey – mean values by professionals (E +NE) and non-entrepreneurs (NE)
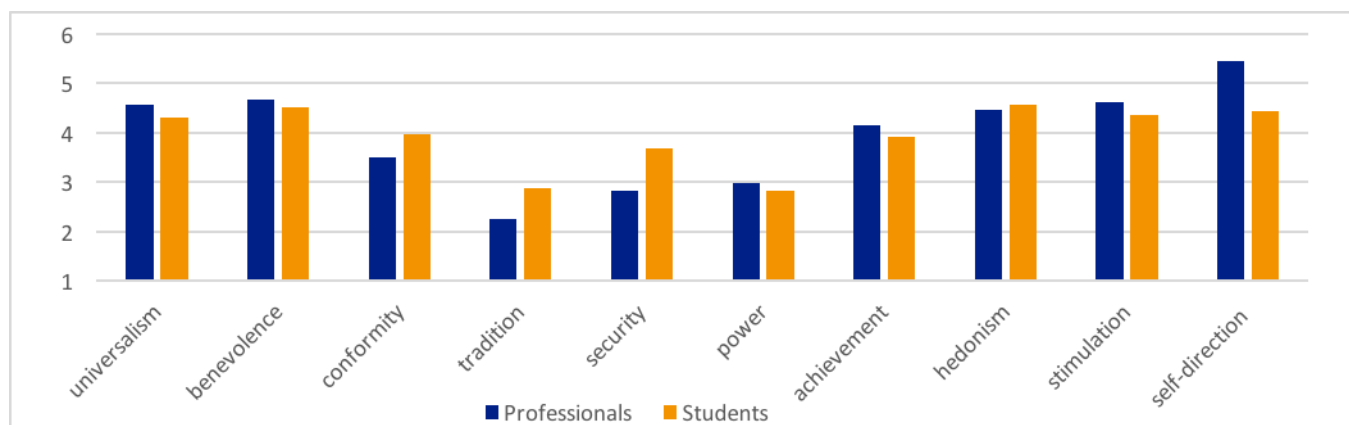
Table 25: World Values Survey - mean values by group. Parametric and non-parametric test results

Variable	Professionals	Students	Wilcoxon Rank Sum test (Professionals vs. Students): p-values	t-test (Professionals vs. Students): p-values
universalism	4.56	4.31	0.04	0.17
benevolence	4.67	4.52	0.21	0.34
conformity	3.50	3.97	0.03	0.05
tradition	2.27	2.89	0.01	0.01
security	2.83	3.69	0.00	0.00
power	2.99	2.84	0.56	0.44
achievement	4.16	3.92	0.20	0.25
hedonism	4.46	4.56	0.58	0.56
stimulation	4.63	4.35	0.13	0.19
self-direction	5.44	4.44	0.00	0.00

Table 26: Entrepreneurial self-Efficacy - mean values by group

Variable	Entrepreneurs	N-E	Students	Professionals
bt_raise_funds	3.13	2.72	2.58	2.98
bt_manage_money	3.21	3.21	3.73	3.21
bt_sell_products	3.57	3.07	2.71	3.39
bt_comm_idea	3.75	3.26	2.74	3.58
bt_people_agree	3.77	3.67	3.55	3.73
bt_leader	3.94	3.77	3.50	3.88
bt_new_products	3.94	3.67	2.53	3.84
bt_dec_making	4.05	3.84	3.55	3.98
bt_opp_recog	4.05	3.65	2.89	3.91
c_be_creative	4.13	3.63	3.00	3.95
bt_solve_problems	4.19	4.40	3.76	4.27
c_think_creative	4.21	3.79	3.10	4.06

Table 27: Tobit Regressions DG 1

Dictator Game 1: Individual contributions (as % of endowment): tobit regressions

Variable	Entrepreneur vs. Non-Entrepreneur			Entrepreneur vs. Students	
	All Stakes	High stakes	Low stakes	All stakes	Low stakes only
Entrepreneur	0.134**	0.00647	0.194*	0.245***	0.259**
	(0.0575)	(0.0698)	(0.0926)	(0.0866)	(0.0991)
Male	-0.119**	0.00787	-0.112	-0.144**	-0.196**
	(0.0554)	(0.0642)	(0.0897)	(0.0688)	(0.0911)
High stake-size	0.0460	-	-	-0.0612	-
	(0.0565)			(0.0924)	
Constant	0.294***	0.327***	0.309***	0.271***	0.281***
	(0.0452)	(0.0598)	(0.0959)	(0.0544)	(0.0647)
Sigma	0.246***	0.193***	0.187***	0.250***	0.284***
	(0.0216)	(0.0232)	(0.0349)	(0.0261)	(0.0392)

Number of individuals	92	41	19	67	44
Log Likelihood	-21.175438	2.97756	0.487	-16.83435	-16.911
LR χ2	9.85	0.03	6.27	11.88	10.01
(Prob.>χ2)	0.01	0.98	0.0436	0.00	0.00
Obs. censored at zero	19	4	3	15	13

Standard errors in parentheses

p<.1, ** p<.05, *** p<.01

Table 28: Tobit Regressions DG 2

Dictator Game 2: Individual contributions (as % of endowment): Tobit regressions

Variable	Entrepreneur vs. Non-Entrepreneur			Entrepreneur vs. Students	
	All Stakes	High stakes	Low stakes	All stakes	Low stakes only
Entrepreneur	-0.0813	0.122	-0.337**	0.238*	0.189
	(0.0997)	(0.136)	(0.122)	(0.129)	(0.131)
Male	-0.106	-0.349*	0.148	-0.211*	-0.128
	(0.135)	(0.204)	(0.147)	(0.108)	(0.117)
High stake-size	0.0628	-	-	0.176	-
	(0.0867)			(0.110)	
Experience in PG	-0.570***	0.122***	-0.462**	-0.641***	-0.657**
	(0.174)	(0.136)	(0.158)	(0.192)	(0.265)
Constant	0.441***	0.558***	0.385***	0.137*	0.102
	(0.114)	(0.163)	(0.110)	(0.0738)	(0.0786)
Sigma	0.292***	0.303***	0.216***	0.285***	0.284***
	(0.0319)	(0.0402)	(0.0415)	(0.0319)	(0.0475)
Number of individuals	60	41	19	73	41
Log Likelihood	-21.9057	-15.951	-1.8693	-27.77	-16.53
LR χ2	11.99	7.67	12.26	27.9	10.63
(Prob.>χ2)	0.01	0.05	0	0.00	0.01
Obs. censored at zero	13	13	4	26	19

Standard errors in parentheses

p<.1, ** p<.05, *** p<.01

Figure 12: Average contribution levels per round by group (professional only) and stake size
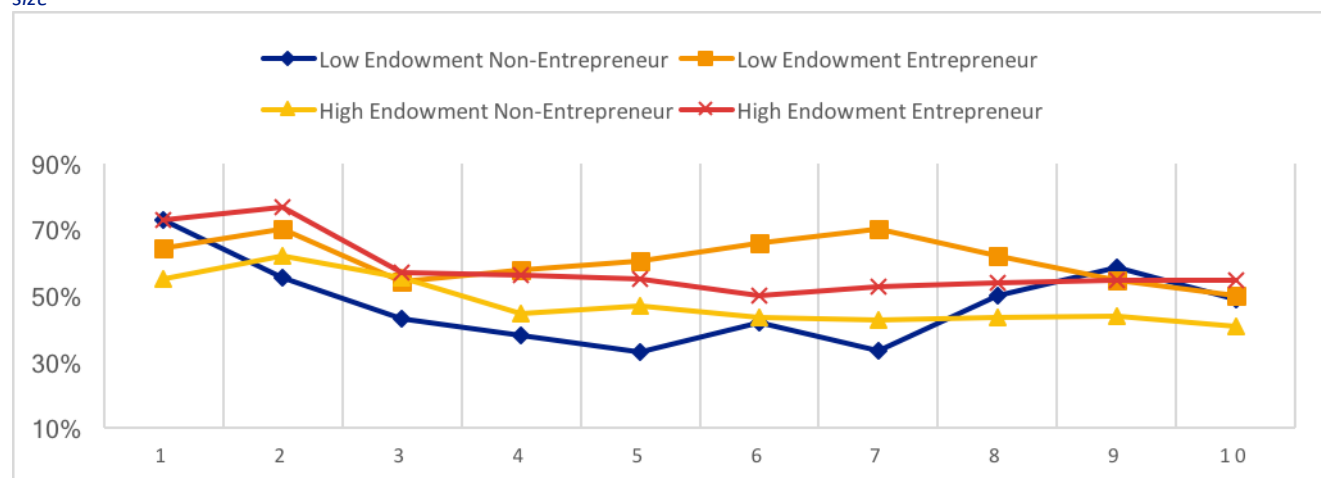
Table 29: Tobit Random Effects Panel Regressions -Cooperation Game

Individual contributions (as % of endowment contributed to the project): Tobit random effects panel regressions

Variable	Entrepreneur vs. Non-entrepreneur			Entrepreneur vs. Students	
	All Stakes	High stakes	Low stakes	All stakes	Low stakes
Conditional Cooperation	0.561***	0.476***	0.780***	0.614***	0.783***
	(0.0600)	(0.0670)	(0.130)	(0.0608)	(0.0811)
Entrepreneur	0.243**	0.218*	0.278	0.173	0.121
	(0.108)	(0.127)	(0.220)	(0.178)	(0.192)
Male	-0.108	-0.0910	-0.118	0.00267	0.0217
	(0.123)	(0.151)	(0.233)	(0.144)	(0.171)
High stake-size	0.0211	-	-	0.0105	-
	(0.107)			(0.177)	
Constant	0.222*	0.285**	0.0971	0.180	0.0998
	(0.130)	(0.136)	(0.231)	(0.114)	(0.128)
Number of observations	1140	779	361	1324	797
Obs. censored at 0	247	155	92	347	246
Obs. censored at 1	356	232	124	443	263
Log Likelihood	-936.85	-624.10	-306.51	-925.65	-473.16
Wald χ2	94.53	53.89	39.37	105.79	95.16
(Prob.>χ2)	0.00	0.00	0.00	0.00	0.00
Error Components:					
σ_u	0.50	0.46	0.61	0.66	0.72
σ_e	0.52	0.49	0.62	0.62	0.43
ρ	0.48	0.47	0.50	0.66	0.74
Standard errors in parentheses					

p<.1, ** p<.05, *** p<.01

Manuscript Submission Report

Mark Sanders

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Sharing and Co-operative Attitudes in Entrepreneurs: A Lab Experiment in the Field

Abstract

This paper presents the results of the Sharing and Co-operative Attitudes Lab Experiment (SCALE) implemented in two entrepreurial events in 2015-2016 in Germany among young entrepreneurs. In comparing their behaviour in a series of monetarily incentivised games, to that of non-entrepreneurs, we conclude that entrepreneurs are more able and willing to sustain co-operation. This suggests that more co-operative types self-select into entrepreneurial venturing and/or entrepreneurship socializes entrepreneurs to become more co-operative. Results on pure altruistic behaviour are less clear and need further research.
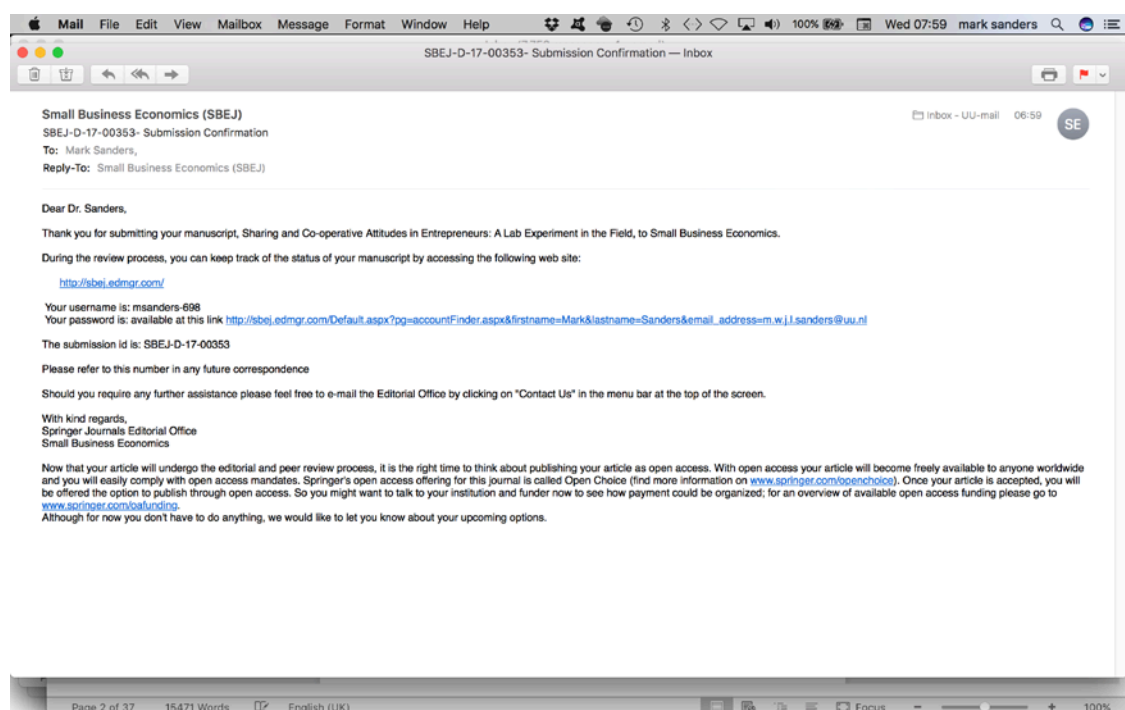
Keywords and JEL-classification

JEL-codes: C91 (Laboratory, Individual Behavior); D62 (Externalities); D64 (Altruism); L26 (Entrepreneurship)

Keywords: Selfishness; Altruism; Co-operation; Dictator game; Public goods game; Entrepreneurship; Experiment

Current Status

Submitted

Manuscript

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Sharing and Co-operative Attitudes in Entrepreneurs: A Lab Experiment in the Field

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Abstract:

This paper presents the results of the Sharing and Co-operative Attitudes Lab Experiment (SCALE) implemented in two entrepreurial events in 2015-2016 in Germany among young entrepreneurs. In comparing their behaviour in a series of monetarily incentivised games, to that of non-entrepreneurs, we conclude that entrepreneurs are more able and willing to sustain co-operation. This suggests that more co-operative types self-select into entrepreneurial venturing and/or entrepreneurship socializes entrepreneurs to become more co-operative. Results on pure altruistic behaviour are less clear and need further research.

Introduction

A central question in entrepreneurship research is: Who is the entrepreneur? In the past, the field has focused on the role of environmental conditions (Gartner, 1988), psychological traits (e.g. Rauch & Frese, 2006; Steward and Roth, Burmeister und Schade 2007; Burmeister-Lamp, Lévesque und Schade 2012; Sandri et al. 2010; Koudsdall et al. 2016) and behavioral aspects such as cognitive biases (e.g. Busenitz). However, studies measuring entrepreneurs' social preferences and their willingness to cooperate are scarce, despite the fact that these two aspects are likely to influence entrepreneurs' decision-making.[1] Moreover, the manifestations of such factors are likely to have implications not only for the direct internal and external stakeholders of ventures but ultimately for society in general. While entrepreneurial activity certainly impacts the economy in a positive way, leading to economic growth, employment creation and high rates of innovation (e.g. van Praag & Versloot, 2007) the results of entrepreneurial endeavours are not guaranteed to be exclusively positive. They can potentially lead to unproductive or even destructive consequences for society for example via rent seeking. In this respect Baumol (1990) stressed the importance of "institutions" broadly defined as constraints on destructive entrepreneurial behaviour. Such constraints, however, are typically weak. Entrepreneurs in their decision-making are usually not subject to e.g. strict reporting requirements, detailed supervision and well developed internal codes of conduct. Yet, we are currently experiencing a continuous increase of emerging social enterprises, driven by the motivation to add social value to our society. What drives this behaviour? The question of their social preferences is also from a societal perspective of elevated importance. Is the identification and exploitation of an entrepreneurial opportunity always and exclusively motivated by private profit considerations? Or do entrepreneurs tend to be more socially oriented, defined here as more willing to share gains and cooperate with others. The aim of this study is to empirically investigate altruistic and cooperative tendencies of entrepreneurs and to thereby gain insight into entrepreneurial behaviour and decision-making in general.

We hypothesize that an entrepreneur's willingness and openness towards cooperation might be an important determinant for the success of the venture. In general, the entrepreneurial environment is characterized by substantial uncertainty (Knight, 1921), high asset specificity and a rather underdeveloped level of infrastructure, often due to the innovative aspect surrounding a new venture. These circumstances require entrepreneurs to open up and effectively engage in cooperative behaviour with their stakeholders in order to successfully build their ventures. Cable and Shane (1997) for example describe and theoretically model the importance of cooperation between entrepreneurs and venture finance providers. Similarly, when attempting to attract human capital or establishing viable customer and supplier relationships the disposition to cooperate can be essential. Maintaining good relations involves a willingness to share and cooperate, even if that goes against one's personal short run gains. While research has established that networks play an essential role in entrepreneurial success (Witt, 2004; Greve et al., 2003), to the best of our knowledge, there is no study empirically investigating the social orientation of entrepreneurs. Our study aims to fill this gap in the literature.

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[1] A notable exception is the paper by Weitzel et al. (2010).

We choose to design and run a lab experiment to investigate this question. This way we can avoid the large risk of socially desirable answers we would likely get in surveys and go beyond the limited generalizability and selection problems in case studies. The powerful combination of monetary incentives, randomization and anonymity ensures we can really get to the true preferences of our subjects. The design of Sharing and Cooperative Attitudes Lab Experiment (SCALE) is structured in four parts: in the first part subjects' level of risk aversion is elicited using lotteries (Holt & Laury, 2002). In the second, third and fourth part of the experiment subjects play dictator (Kahnemann, 1985) and public good games (Ledyard, 1995). Subjects are randomly paired to a new counterparty after each part.

We contribute to the literature by empirically investigating the sharing and cooperative tendencies of entrepreneurs using game-theoretic concepts and discuss the resulting implications for an entrepreneurial context. We further aim to establish whether the behaviour of entrepreneurs in these games significantly differs to the behaviour of business and economic students, often used as proxies for entrepreneurs in experimental studies. As about 50 percent of our subject pool is drawn from a non-student population, we achieve not only a better representation of the general population (in particular relevant for a business context), but also an indication whether economics and business students actually meet the proxy assumption mentioned above.

Our results show that entrepreneurs, with several nuances that can be made, are indeed more willing to share and cooperate than non-entrepreneurial professionals and, importantly, than economics and business students. With the rising interest in social entrepreneurship (REFS) this suggests that entrepreneurship is not only about doing well for oneself, but also about doing good for society. Our experiment also implies that interpreting the results from experiments with student subject pools should be treated with caution. Researchers should instead venture out into the field to reproduce their results with actual entrepreneurs to draw more reliable conclusions.

Theory and Hypotheses

The theory of other-regarding preferences (ORP) assumes peoples' utility functions to incorporate the outcomes or consequences of other people (generally their monetary payoff) to some dimension. Most of the models developed in this context are based to some extent on the concept of fairness.[2] To investigate the degree to which entrepreneurs hold positive ORP, that is, they weigh the welfare of others positively in their own utility, we make use of game theoretic concepts, allowing us to closely study altruism and cooperative behaviour, by contrasting it to the predictions of behaviour under the assumption of narrowly self-interested preferences and unboundedly rational behaviour. As will be outlined in more detail in the following section, we make use of two simple games to capture the preferences of interest to us: in case of eliciting the preferences

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[2] The literature distinguishes between different types of ORP: (1) distributive ORP (Bolten, 1991; Bolton & Ockenfels, 2000; Fehr & Schmidt, 1999), (2) reciprocal ORP (Fehr, Kirchsteiger, Riedl, 1993; Berg, Dickhaut & McCabe (1995), (3) both distributive and reciprocal ORP (e.g. Bolton &Ockenfels, 2000; Charness & Rabin, 2002; Dufwenberg & Kirchsteiger, 2004).

of fairness and altruism we let subjects play a simple, one shot (static) dictator game; for measuring cooperative tendencies, we apply a dynamic voluntary contribution game. Dynamic games are played over time (i.e. over several rounds or periods) and allow players to develop ongoing relationships (Aumann & Hart, 1992). A feature of iterated games is that choices made in each period, do not only affect the payoff of the current period, but also influence future interactions of the players. Further, by providing feedback or information to the players during the game, i.e. about the behaviour of the counterparty, we allow for learning and potentially adjusting one's own strategies throughout this game. The rational game-theoretic equilibria in repeated games are determined by backward induction. This implies anticipating the behaviour of the counterparty in the last round of the game and to adjust one's own behaviour according to this expectation. This process is repeated iteratively for the second to last round and so on, until the first round of the game is reached.[3] The voluntary contribution game in our case presents a social dilemma. Social dilemma games are characterized by a Pareto deficient equilibrium, and off-equilibrium behaviour within these games is generally interpreted as *cooperative* behaviour because cooperation within the context of these games increases efficiency as well as overall welfare. Hence, immediate self-interest within these games conflicts with social efficiency (as is the case in many real-world situations). In a voluntary contributions game both parties benefit from the cooperation but defecting cooperation (also termed freeriding) remains the dominant strategy for every individual in the game. In this section, we next outline our motivation for eliciting these preferences in the context of entrepreneurship and describe the games applied for this purpose in more detail. Then we describe how these games were implemented in three different instances and groups of subjects. After presenting and analysing the results, we briefly conclude.

Fairness and Altruism in an Entrepreneurial Context.

Understanding how entrepreneurs perceive fairness and to what degree they behave altruistically might offer important insights, not only in relation to devising government policies inducing desirable behaviours but also for gaining a better understanding of entrepreneurial decision making in general. Empirical investigations regarding entrepreneurs' social preferences in the literature appear scarce; a notable exception are the studies by Weitzel et al. (2010) and Urbig et al. (2010). Weitzel et al. (2010) empirically investigate selfish behaviours of entrepreneurially *talented* people (using a student sample), by analysing allocation choices within various forms of dictator games. Their findings show, that people with high business talent (self-efficacy) generally care less about others within these games. Subjects' beliefs regarding their own creative and business skills (relative to their peers) play a significant moderating role and lead to systematic differences in the findings: whereas all other groups cooperate and give approximately the same, subjects indicating higher talent in business-related skills and low creative skills allocate significantly less money to their counterparty. Considering these findings, we control for entrepreneurial self-efficacy in our experiment. Moreover, we partially replicate their design,

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[3] Strategies that take into account the whole sequence of periods is termed „super game", while each period and its adjunct previous/following period is termed a sub-game.

and expand it with a standard cooperation game to be able to test for the importance of strategic interaction (see section on cooperation) using actual entrepreneurs and professionals as well as students as subjects.

Urbig et al (2012) complement the study by Weitzel et al (2010) and investigate how student subjects with entrepreneurial intent exploit risky investment opportunities with positive and negative externalities. The authors find subjects with high levels of entrepreneurial intent to invest significantly less into destructive scenarios. This suggests that individuals with the intent of becoming an entrepreneur might exhibit higher levels of ORP than others.

Within their experimental design, Urbig et al. (2012) control also for entrepreneurial talent (self-efficacy) and find, in line with the findings by Weitzel et al. (2010), individuals scoring high on business talent items to invest significantly more into the destructive scenarios. Taking these results together, one may conclude that entrepreneurial intentions are good, as is creative talent to become an entrepreneur. But (self-reported) business talent would seem to characterize the less socially oriented. However, one could raise concerns of external validity due to the application of the experiment in a student subject pool rather than experimenting with actual entrepreneurs. That is, students who express an interest in starting a business and self-assess their ability to do so, may well not be the people that go on to become (successful) entrepreneurs later in life. If their willingness and ability to cooperate and share has any systematic relationship to their probability of starting a venture, then such selection effects may well offset or even reverse the results. Our first contribution to this emerging literature therefore consists of implementing the same game with a subject pool of actual entrepreneurs. To be more specific, we want to investigate whether entrepreneur's other-regarding preferences differ to those of non-entrepreneurs. Past research has made extensive use of experiments in this regard (e.g. Fehr & Schmidt, 1999; Bolton & Ockenfels, 2000; Andreoni & Miller, 2002) and findings clearly demonstrate that people generally do care about the outcome of others. To the best of our knowledge, we are the first to show how entrepreneurs compare in this regard.

To test for the preferences of altruism and fairness, we follow Weitzel et al. (2010) and make use of the standard dictator game (Kahnemann et al., 1986; Forsythe et al., 1994) in our experimental design. In the classic dictator game, originally invented to test the income maximization assumption, there are two players: the dictator and the recipient. The dictator, endowed with a sum of money, decides how much of her endowment she is willing to allocate to the recipient, who simply must accept the offer.[4] Standard behavioural assumptions in economic theory would predict the dictator to make zero allocations, as this strategy maximizes her private returns. However, past research (see Engel, 2010 for an overview) has shown most dictators deviate from this strategy and allocate some of their endowment to the recipient. A review of the evidence shows that average offers range between 0.275 and 0.383 between Western and indigenous cultures (Engel, 2010) and vary significantly over time and space within these groups. These differences have been related to cultural and social characteristics. Concepts used to explain the behaviour in this game range from the notion

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[4] It is important to note that the recipient's role in this game is completely passive, i.e. he cannot object the allocation decision of the dictator (as in the Ultimatum Game). Moreover, both the dictator and the recipient are anonymous and randomly assigned roles. Consequently, strictly speaking, since any strategic component or risk is missing, the dictator game does not really qualify as a game but an allocation task.

of fairness and altruism to inequity aversion (e.g. Kahneman et al, 1986; Rabin, 1993; Fehr and Schmidt, 1999). For a debate on this, see for example Binmore & Shaked (2010) and Fehr & Schmidt (2010). For our research, it is mainly important to note that the caring behaviour measured in this game is a form of *unconditional* kindness and hence unrelated to the concept of reciprocity (Fehr & Gächter, 1999) or strategic interaction. These notions we therefore investigate separately in our experiment and outline in more detail in the following section. The results in Urbig et al. (2012) suggest we might expect a positive difference, as entrepreneurial intent correlates positively with social behaviour, but we do not have a directional hypothesis in relation to the concept of altruism. We are rather interested how entrepreneurs' action within these games compare to those of other subject groups.

Cooperation and Venture Success

We know from stakeholder theory the importance for firms to build strong and trusting relationships with relevant stakeholders (Barringer & Harrison, 2000). Such relationships are especially important in the context of entrepreneurship. Faced with major resource constraints entrepreneurs need to develop strategic relationships as to successfully found and grow their ventures (Maxwell & Levesque, 2014; Pollack & Bosse, 2014; Sheperd & Zacharakis, 2001). Moreover, entrepreneurs generally need to initiate and build most of these relationships themselves and from the ground up. New ventures, by definition, lack a record of accomplishment, and engage in innovative, risky activities. This might induce behaviours and decision-making not captured by general stakeholder theory (Pollack et al. 2017). For example, research in the field of entrepreneurial finance has shown the reliance on reciprocal, cooperative relations and social control mechanisms, like trust, to be potentially more important than standard formal control mechanisms (Sapienza & Korsgaard, 1996; De Clercq & Sapienza, 2001; 2006).[5] Further, entrepreneurial environments are characterized by high risk and uncertainty (Knight, 1921), information asymmetries (Dutta & Folta, 2015) and oftentimes misaligned interests (Cable & Shane, 1997). All circumstances offering a viable environment for opportunistic behaviour. Especially, since the given context does not allow for the design of complete and enforceable contracts (Williamson, 1985; Cable & Shane, 1997; Hellman, 2007). Consequently, trust and cooperation (social norms) between the parties appear to be essential for overcoming fear of opportunistic behaviour. Inaugurating qualitative and long-term relationships is therefore important for risk reduction[6] and venture success (Mayer, Davis & Schoorman, 1995; Howorth & Moro, 2006; Schoorman et al. 2007; Welter & Smallbone, 2006; Larson, 1991; Parkhe, 1993) and e.g. Suarez-Villa (1998) shows that entrepreneurial firms engage in significantly more cooperative strategies than their larger, more mature counterparts. The ability and willingness to cooperate could therefore be an important asset to entrepreneurs. We investigate cooperative behaviour of entrepreneurs by using a dynamic voluntary contribution mechanism, called a standard public good game (see Ledyard, 1995), in our case with two players.[7] Dilemma games, such as the public good game,

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[5] E.g. having the investors on the Board of Directors.
[6] Thereby, referring to the reduction of performance risk. Obviously, entering a relationship introduces relational risk.
[7] We apply non-cooperative game-theory, entailing only situations in which contracts or arrangements are not binding or enforceable, resembling the entrepreneurial environment.

are generally used for modelling and studying interactive and strategic behaviour of individuals. The game's set-up is as follows: At the beginning of the game, each player, $i=1,2$, is given a certain monetary endowment. The players then *simultaneously* decide, how much of their endowment they want to invest to the creation of a public good or project.[8] The individual's monetary payoff π_i strategically depends to the actions of the counterparty and is defined by the following payoff function:

$$\pi_i(g_1, g_2) = endowment - g_i + \alpha(g_1 + g_2)$$

Thereby, g_i denotes player $i's$ contribution to the project. The production function of the project is given by the sum of both players' contribution to the public good ($g_1 + g_2$). The mariginal per capita return of investing into the project is given by α. Since the game is designed as a social dilemma game, it must hold that $1/n < \alpha < 1$[9]. Based on this condition, whatever the contribution of the opponent, the marginal cost of investing (equal to one) is higher than the marginal return of investing and the dominant strategy for both players would be not to invest any endowment to the project ($g_1 = g_2 = 0$). The Nash Equilibrium payoff is therefore defined by $\pi_i^{NE} = endowment$. However, since the joint marginal return ($n * \alpha$) is *higher* than the cost of investing, the Pareto efficient outcome is characterized by both players contributing their entire endowment to the project. In that case, the payoff to both players is $\pi_i(g_1, g_2) = 1.4 * endowment$.

This game has been used extensively in experimental economics to study whether individuals play the self-interested Nash solution or act cooperatively and contribute to the project. Playing the game in an iterated version further allows us to measure subjects' levels of conditional cooperation or reciprocity.

An important technical distinction needs to be made between reciprocity and cooperative behaviour. While the former is described as responsive behaviour to the previous actions of the counterparty *regardless* of potential future material gains/losses, cooperative behaviour is rather in direct relation to these future potential payoffs (Fehr and Gächter, 2000). The willingness to contribute to the project because other players are also contributing describes the notion of positive reciprocity. Negative reciprocity arises when an individual, who contributed to the project in the previous round of the game (t-1), while the counterparty contributed nothing or significantly less (free-rode), decides in the current round (t) of the game to penalize the counterparty for this behaviour by contributing significantly less (or zero) to the project (tit-for-tat). This means that after several rounds of the game, the behaviour of free-riders and (negative) reciprocators is indistinguishable when considering their contribution levels in the current round only. The same holds for (positive) reciprocators and players who always play a cooperative strategy. In game theory, it has been shown that variations of a tit-for-tat strategy in (infinitely repeated or open ended) games can sustain cooperation even among self-interested individuals (Axelrod, 2006). That is, cooperation need not be the manifestation for ORP, but it has also been shown that the cooperative equilibrium is much easier to reach and sustain when ORP and some altruism is present (Camerer and Fehr, 2006).

In our experiment, we empirically investigate whether cooperative types, who understand the importance of strategic cooperation, are more prevalent in the entrepreneurial environment. The context of the public good

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[8] The project in our case was not framed or specified further. It was just called "the project".
[9] In our experimental design, α was set at α=0.7.

game has also been used to analyse the establishment and maintenance of social norms (Ostrom, 2014). Understanding the occurrence (or lack thereof) and nature of social norms seems particularly relevant in an entrepreneurial environment, where contracts are oftentimes informal, due to the high level of uncertainty surrounding this field. Fehr and Gächter (2000) describe the important impact of social norms in our decision-making, be it in our personal or working life, and state "[…] the role of reciprocity as a norm enforcement device is perhaps its most important function." (p.168). Because entrepreneurs should be more experienced with cooperation and understanding the strategic importance thereof, we expect this group to exhibit higher levels of (conditional) cooperation in the public good game.

Cooperation Hypothesis

We expect entrepreneurs to exhibit higher average contribution levels in the Cooperation Game in relation to the other subject groups.

Recruitment Procedure

For our entrepreneurial subject pool, we conducted so-called lab-in-the-field experiments at two different entrepreneurship conferences in Hamburg and Berlin. Both conferences had a strong focus on high technology and innovation – particularly in relation to the internet. The first four experimental sessions were conducted at the ECFI – the European Conference on the Future Internet in Hamburg in November 2015.[10] More than 1000 international guest participated at the conference. The crowd consisted largely of entrepreneurs, venture capitalists, business angels, accelerators and scientists. The conference provided numerous workshops (e.g. hackathons), lectures, pitching competitions, and networking opportunities; all catered towards an entrepreneurial crowd.

An additional four sessions were conducted at the Tech Open Air (TOA) in Berlin, one of Europe's leading interdisciplinary technology festivals.[11] The festival is a well-known technology conference (founded in 2012) in and out of Europe.[12] At Tech Open Air, a large number of entrepreneurs, investors and start-ups (predominantly from the digital and high technology industry) come together, with the aim of generating a platform for multidisciplinary knowledge exchange, collaboration, and development. The conference's program includes speeches, pitches and various workshops, again catered to an entrepreneurial crowd. The experiment was computerized using the experimental software z-Tree (Fischbacher, 2007) and run via a mobile laboratory, consisting of 20 laptops and sideboard blinders to increase the level of anonymity and privacy.[13]

The recruitment process for both conferences was identical: Subjects were recruited directly at the conference location. Upon approach, it was briefly explained to them that they had the opportunity to participate in a

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[10] Note, all session were conducted as high-stake treatments.

[11] Thereby, 2 sessions were conducted as low stake treatments and 2 were conducted as high stake treatments. It was randomly decided at the beginning of the session (by getting a randomly chosen subject to pick a sealed envelope, with the choice of whether the session would be played as high or low stake treatment).

[12] TOA started in Berlin but has also organized conferences in Los Angeles and Tokyo.

[13] In particular, in relation to the games played anonymity is very important as to avoid reputation concerns, beyond those intended by the game, are avoided.

decision-making experiment in which they, based on their decisions, could earn money. Potential subjects further received information about (a) the location of the room (which was also provided in the programs of the conferences), (b) the duration of the experiment and (c) the different time slots available for participation. Additionally, flyers with this information were handed out. We cannot, based on the questionnaire design, make any statements regarding the degree of acquaintance between the subjects. However, throughout the recruitment process people were generally approached individually or if they were in pairs, they were asked to come to sessions at different time slots. Additionally, we beforehand set the minimum level of subjects per session to N=8, to assure sufficient anonymity.

All eight sessions lasted between 45 and 60 minutes. When subjects arrived at the experimental lab, they were randomly allocated to one of the 20 laptops. This was done by blindly drawing a numbered ticket, linked to one of the laptops. Once all subjects were allocated to a laptop, the experimental instructions were read out aloud by the experimenter and at the same time visible on the computer screens. Subjects were informed not to communicate with each other throughout the entire experiment. Also, they were ensured that all information provided by them would be treated confidentially and anonymously and that none of the other participants would be able to trace their contribution decisions back to them. During the first instructions, subjects received information about the general structure of the experiment and the incentive compatibility mechanism of the experiment. Finally, they were informed that they would receive further, more detailed instructions once they would enter the different parts of the experiment.[14] Subjects had the opportunity to raise their hand and ask the experimenters questions throughout the entire experiment.

The experiments with the student subject pool were conducted in the laboratory of Humboldt University in Berlin in Mai 2017. Here students from the field of business and economics were recruited via the recruitment system ORSEE (Greiner 2015). In total N= 62 subjects participated. The operational procedure in the laboratory was identical to the one outlined for the participants at the conferences. Sessions lasted again between 45-60 minutes.

Experimental Structure

The experiment itself consisted of several different parts, which will be outlined in detail next. The first four parts of the experiment represent the incentive compatible parts, followed by a questionnaire collecting control variables, which, based on past research, might be relevant for the study at hand. We changed the stake sizes of the incentive compatible part of the experiment (i.e. the Holt & Laury Lottery, the Dictator Games, and the Public Good Game) within our entrepreneurial crowd sample.

Holt and Laury Lottery

In the first part of the experiment, subjects played a "Holt and Laury" lottery, whereby ten paired lottery choices (lottery "A" and lottery "B") were presented. Subjects have, for each of the 10 presented lottery pairs,

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[14] Copies of the complete instructions are available from the authors upon request.

to decide which lottery type (A or B) they would prefer to play. This method allows eliciting an individual's level of risk preference by observing at which lottery pair an individual makes the crossover from lottery "A" (the less risky lottery) to lottery "B" (Holt and Laury, 2002). A participant consistent with standard expected utility theory (monotonicity axiom) can only have one crossover point. Further, the crossover always goes from the safe option (A) to the risky option (B). Finally, sticking with option "A" for all 10 lotteries violates the axiom of dominance. Some of our participants do violate the assumptions of rational behaviour within this game (i.e. depicting more than one crossover point), hence exhibiting inconsistent risk attitudes. These individuals are eliminated from the analysis whenever risk attitudes are assessed. Higher values of this variable denote higher levels of risk aversion. In the high /low stake treatment subjects could earn up to €15.40 / €3.85 Euros in this part, respectively.

Dictator Game 1

In the second part of the experiment, subjects played the first dictator game.[15] Thereby, subjects received the general instructions of the game, and were informed that the computer would randomly assign them to the role of "participant 1" (the dictator) or "participant 2" (the receiver). The game was worded in an unframed, neutral context, in which simply an "opportunity" was presented. All student subject dictators received an endowment of 5 Euros. The endowment in the entrepreneurial sample varied: dictators received a 20 Euros endowment in the high-stake case, and a 5 Euros endowment in the low stake case. All endowments were payoff relevant. Instructions further highlighted that the matched counterparty would hold only for this part of the experiment and be randomly matched anew for each of the following parts. Subjects were further informed that no money earned in any part of the games could be transferred to other parts. Next, subjects had to answer comprehension questions to ensure their understanding of the payoff function. Once completed, the computer randomly allocated the roles, and the dictator made his/her allocation choice. It was possible to split the endowment in cent amounts.[16] The receiver did not obtain any feedback information regarding the dictator's choice until the very end of the experiment, as we wanted to avoid subjects being potentially influenced by feedback regarding the received contribution (or lack thereof) in the following games. Since we are interested in eliciting subjects' intrinsic preference of altruism/ fairness in this section, we aimed to exclude any potential mixed motive, i.e. strategic considerations. Therefore, this game was played as a "one-shot", or static game.

Cooperation Game

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[15] Note, subjects were not informed of playing another dictator game later in the experiment. They were simply told there would be several different parts of pay-out relevant games.

[16] Hence, action space in this game was continuous, and not as usual quasi-continuous, as subjects could decide to give any amount, and were not limited to giving in integer dollars. This was also decided on the basis, that an equal (50:50) split had to be made available to the subjects, which involved cent amounts in the 5 Euro endowment case. We deemed this crucial also for cross-sample comparison reasons.

In the third part of the experiment, subjects played a standard linear so called public good game (for an overview see Ledyard, 1995) with 2 players.[17] Subjects were randomly matched with a new counterparty. The following monetary payoff function (1) was carefully explained to the subjects, thereby providing several in-depth calculation examples in the instructions.[18]

$$\pi_i(g_1, g_2) = endowment - g_i + \alpha(g_1 + g_2) \tag{1}$$

The instructions described the public good neutrally as "the project" and we avoided the term "public good". For that reason, we will also refer to this game as the "Cooperation Game". The total contribution to the project is given by the sum of contributions $g_1 + g_2$. In our design, the marginal payoff from individual i's contribution to the project, $\frac{d\pi_i}{dg_i} = -1 + \alpha = -0,3$ is negative, but the social marginal benefits $\frac{d\sum\pi_i}{d\sum g_i} = -1 + 2\alpha = 0,4$ are positive. The payoff function is designed so that the pareto optimum is defined by all participants contributing everything to the "project", while the dominant strategy for an individual subject is to contribute nothing.

After reading-out the instructions, subjects had to answer six comprehension questions[19], thereby ensuring that all subjects clearly understood the procedure and the financial consequences of their choices. Once all participants had correctly completed the comprehension questions, they received further, more detailed, game-specific information, namely that several rounds of the game would be played and that their randomly assigned counterparty would remain the same for all rounds played. As we are interested in investigating inter-temporal, strategic choices, subjects played ten rounds of the public good game. After every round, subjects received feedback about (i) their counterparty's contribution, (ii) their own contribution and (iii) the consequently resulting (potential) profit from the respective round. Information in the context of voluntary contribution games allows subjects to engage in social comparison, whereby the behavior of the counterparty serves as a reference point (Bazerman et al. 1992). This information is important when individuals strongly care about how their contribution compares to the contribution behaviour of the counterparty (Andreoni and Petrie, 2004).

We decided not to explicitly inform subjects about the exact number of rounds to be played - instructions simply informed that they would play "several rounds of the game" – as we wanted to avoid behaviour of strong iterated thinking. This arguably makes the situation more realistic (see Progrebna et al. 2011).[20] Finally,

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[17] We decided on a two-player game, rather than a multi- player game as we wanted to minimize the coordination aspect and focus rather on the strategic aspect of cooperation, in line with our research question. In addition, while a public good game with two individuals is often argued to be like a classic Prisoners' dilemma game, the games are not identical. The voluntary contribution mechanism in the Public Good Game has a considerably larger strategy set than in the classic Prisoners' dilemma game with only two choices (defect/cooperate) (Isaac and Walker 1988).

[18] Thereby, the examples were constructed, ordered and written up in such a way that the possibility of subjects becoming anchored in their decision choice was minimized.

[19] Again, the questions were constructed, ordered and written up in a way that we believed would minimize the possibility of subjects becoming anchored in their decision choices.

[20] It could be argued that noise is generated within our data by not telling subjects about the exact number of rounds to be played, as subjects could potentially guess about the exact number of rounds to be played, creating endgame effects. However, as subjects were aware, that there would be more parts in the experiment (of which they had no detailed

participants were informed that out of the "several" rounds played, one would randomly be drawn by the computer for compensation purposes at the end of the experiment. Again, none of the profits earned in current rounds could be accumulated or used in following rounds. [21]

Dictator Game 2

Once the public good game was completed, participants continued with part four of the experiment – the last game. Here, subjects played another one-shot dictator game, this time taking the opposite role as in the first dictator game (i.e. if they were the receiver in the first game they were allocated the dictator role in this part and vice versa if they were dictator in the first part). The counterparty, however, was not the same as in Dictator Game 1 but was randomly matched anew by the computer. It was stressed in the instructions that the counterparty in this part would most likely not be the same person as in the previous parts. Again, students received 5 Euros endowment, while in the "entrepreneurial crowd" sample the dictator was endowed with 20 Euros in the high-stake treatment and 5 Euros in the low-stake treatment. Endowments and allocation choices were pay-out relevant. Subjects received feedback regarding the allocation decision at the end of the experiment (after the questionnaire, described below, was completed).

Stake Size
There is mixed evidence regarding the strategic effect of different stake sizes on players. While most studies found no difference in this regard[22] others found a negative correlation between stake size and contribution behaviour.[23] In Engel's (2011) meta-study on the Dictator Game, the author finds a significant negative effect on dictators' allocation decisions for high stakes. Camerer et al. (1999) deal with the literature of stake size within bargaining games and conclude that stake size within this context does not affect subject's average level of self-interest, but that higher stakes potentially decreases the variance of subjects' behaviour. Within this context, also risk aversion might play a significant role (however, this should be more the case in the Public Good Game as in the Dictator Game, as it is unclear how risk would factor into this non-strategic game). To control for stake size, we implemented our experiment at Berlin TOA with two average levels of pay-out, one corresponding to the stake size used in Hamburg and one equal to the stake size in the student sample.

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information, i.e. regarding their required time frames) we believe it was hard for them to estimate or make guess about this.

[21] We further decided not to elicit subjects' beliefs regarding the actions of the counterparty, as beliefs don't allow us to distinguish between free riders and distrustful conditional co-operators (i.e. those that contribute nothing AND believe the other will not contribute anything either and people that contribute nothing BECAUSE they believe others will contribute nothing (see Fischbacher & Gächter 2010).

[22] Forsythe et al. (1994) and List & Cherry (2008) in case of the Dictator Game. Hoffman, McCabe & Smith (1996) and Slonim & Roth (1998) using the Ultimatum Game. Carpenter, Verhoogen & Burks (2005), applying both the Dictator and Ultimatum Game. Fehr et al. (2002) for the gift-exchange game. Clark and Sefton (2001) for a sequential Prisoner's Dilemma game. Kocher et al. (2008) for a linear Public Good Game.

[23] Johannson-Stenman et al. 2005 in the trust game; Andersen et al. (2011) in the Ultimatum Game (however, it should be noted, that the stakes in this study were very high (some as high as an average annual income).

Incentives

Subjects' total pay-out was determined by the previously described four parts at the very end of the experiment (after the questionnaire). Thereby, for the first part (Holt & Laury lottery) the computer randomly chose one of the ten lottery pairs relevant for pay-out. For the dictator game, subjects were paid out the money they decided to keep for themselves (when allocated the role as dictator) and the money they potentially received (in the role of the receiver). Finally, as previously described, one of the ten rounds in the public good games was randomly selected for pay-out.

The experiment concluded with a questionnaire collecting additional (control) variables, which, based on the literature, might be important for understanding the behaviour during the games. Thereby, subjects first had to answer general demographic questions, followed by questions from the German socio-economic panel (SOEP) measuring trust. Next, participants answered questions eliciting personal values based on Schwartz's value theory (Schwartz, 1992). Finally, we measured entrepreneurial self-efficacy in the same manner as done in the study by Weitzel et al. (2010).

Data & Results

Entrepreneurial/Professional subject pool

Across the two conferences, in total N=120 entrepreneurial subjects participated: n=46 from the ECFI in Hamburg (all high stakes) and n=74 from the TOA in Berlin (n=36 for the low stake and n=38 for the high-stake treatment). The sample's overall average age was 31.9 years (S.D. 6.61) and consists to 77 percent (n=92) of males. As we are particularly interested in the behaviour and decision-making of entrepreneurs, we split the entrepreneurial sample further into sub-samples of entrepreneurs (E) (n=77) and non-entrepreneurs (NE) (n=43)[24]. The gender ratio varies across these sub-populations: the male ratio amounts to 85 percent males in the entrepreneurial sample and 60 percent in the non-entrepreneurial sub-sample. While this ratio might appear unbalanced, in particular in the sub-sample of entrepreneurs, it is in fact reflective of the current gender ratio prevailing in the start-up industry. According to the German start-up monitor (2016), the ratio of female founders within the German start-up industry currently amounts to 13.9%. Correspondingly, the Diana Project[25] (2014), investigating the gender gap within the venture capital industry, finds that out of all US companies receiving venture capital only 15 percent had at least one woman on the executive team. If anything, one would have expected the gender bias to be even stronger in the high-tech events we recruited our subjects at. Most subjects in our entrepreneurial sample grew up in Europe (84.2 Percent) and/or live there now (92.5 percent). The average working experience amounts to 4.3 years (S.D. 4.8) for the entrepreneurs and 5.3 years (S.D. 5.6) for the non-entrepreneurs.

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[24] The non-entrepreneurial sample consists of e.g. employees of the start-up and technology industry (16.2%), consultants (14%), engineers/developers (12%), product managers (14%), creative artists (12 %), and students (12%).

[25] This project was funded by the Kauffman Foundation, the U.S. Small Business Administration, the National Women's Business Council, and the Swedish Institute for Small Business Research.

Student subject pool

The average age of our (N=62) student subjects is 22.9 years. Thereby, females constitute 53.2 percent within this group. We recruited students exclusively from the faculty of economics and business.[26] Again, most subjects from this group (93.5%) grew up in Europe.

In addition to the same trust (SOEP), value (WVS) and entrepreneurial self-efficacy questions, elicited in the professional group, we asked student subjects questions regarding their entrepreneurial intentions (EI). We measured this construct using a 5-item measure developed by Chen, Greene, and Crick (1998). Example items include "How interested are you in setting up your business" and "How likely is it that you will set up your own business in the near future." Responses to items were averaged to form an overall measure of entrepreneurial intention. Higher scores thereby represent greater levels of intentions.

Throughout the rest of the paper, a considerable part of the analysis will focus on the factors of "group" and "stake size": Thereby, the professional sample is sub-divided into the groups of entrepreneurs (E) and non-entrepreneurs (NE), the student sample (S) constitutes the third level of the group factor. Stakes are based on the two levels of high (H) and low (L) stakes. The notation used in the following is summarized in table 1 below.

Table 1: Experimental Group Notations

	High-stakes	Low-stakes
Entrepreneurs	H-E	L-E
Non-Entrepreneurs	H-NE	L-NE
Students	n/a	L-S

Psychometric Variables

We start our analysis by looking at the results of the psychometric scales. We thereby compare whether results on the respective scales are similar across all (sub) - group, or whether we find significant differences.[27]

Trust

Comparing the levels of the SOEP trust items between the sub-groups of our professional sample (E vs. NE), we find no significant differences on any of the trust items elicited.[28] [29]

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[26] Thereby, 50% studies economics, 35% are business students; 10% study a combination of economics and business, and about 5% major within statistical methods.

[27] Although most of our psychometric variables are ordinal in nature, we treat them in our analysis as interval data and use mostly parametric analytics. Applying parametric test to ordinal data has widely been acknowledged as suitable for analysis (see Carifio & Perla, 2008; Lee & Soutar, 2010). However, we also use non-parametric tests, such as the Wilcoxon rank sum and Kruskall Wallis test to check for the robustness of the findings.

[28] Using both a t-test and the Wilcoxon rank-rum test.

Comparing the (joined) professionals' (NE and E) trust levels to those of the student sample, we observe students to display significantly lower levels of trust on all three main items of the scale.[30] Table 7. in the Appendix summarizes the findings across groups for the trust measure. The table also compares our results to those obtained by Caliendo et al. (2012). In their study, the authors analysed, using SOEP data, the same set of trust questions across different employment states. Comparing the trust level of our entrepreneurial/professional crowd, to the group of self-employed individuals obtained by Caliendo et al. (2012), we observe higher levels of trust within our entrepreneurial sample on every item elicited.[31] This is worth noting, given the fact, that the authors report the self-employed to display significantly higher levels of trust in relation to those not being self-employed or employed at all. Our student sample, in contrast, is found between Caliendo's self-employed and our entrepreneurial crowd, leaning more towards the self-employed, meaning they are still more trusting than the average employee or unemployed person. The first impression here, however, is that students are not representative of entrepreneurs, professionals or of the general population when it comes to trust. This is not too surprising, as students live in a particular stage of their lives and experience can of course shape their attitudes in later life.

World Values Survey

Based on the average ratings of the 6-point Likert scale, the entrepreneurs' ranking of the 10 values from highest to lowest is as follows: (1) Self-Direction, (2) Stimulation, (3) Benevolence, (4) Universalism, (5) Hedonism, (6) Achievement, (7) Conformity, (8) Power, (9) Security and (10) Tradition. For the non-entrepreneurs, the ordering of ranks is very similar: (1) Self-Direction, (2) Benevolence, (3) Universalism, (4) Hedonism (5) Stimulation (6) Achievement, (7) Conformity, (8) Security, (9) Power and (10) Tradition. Comparing the individual values between the two groups, we find, applying univariate analyses, (marginally) statistically significant differences on the values of self-direction (p=0.02)[32] and power (p=0.07). However, when additionally controlling for gender, the effect disappears for the variable of power.[33] The finding seems sensible, given that the defining objective of self-direction presents independent thought and action, such as choosing own goals and being creative (Schwartz, 1992). Entrepreneurship research has well documented the need of entrepreneurs to act independent and autonomous (e.g. Carland et al. 1984). The similar ratings on the remaining items could be driven by the fact that this sample of professionals, works in very similar environments and therefore value similar aspects. We know for example that jobs within start-ups are not as

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[29] Thereby, it should to be stressed that our NE group does not really represent "employed" individuals in the broader sense. While not being self-employed, a large share of them actively engage with entrepreneurs and entrepreneurial venturing, and/or work in start-ups, creative or scientific organizations, partially at high managerial levels. This might be an explanation why we observe no differences between NE and E in this group.

[30] Note: we calculated an overall index of trust (termed trustscoremain), following the approach by Caliendo et al. (2012). The difference on the overall index is highly significant (p<0.000).

[31] But not testing statistically for significance.

[32] The non-parametric Wilcoxon rank sum test confirms the difference on the Self-Direction variable (p=0.01) between E and NE.

[33] In line with research, we find males to rate the value of "Power" significantly higher than females (p=0.025).

secure as in other industries (Van Praag and Versloot, 2007), it consequently takes individuals, placing less value on job security to work for these young companies. At the same time, these young companies often provide stimulating environments, where allowed or even encouraged to think "outside the box", where employees are less confronted with conformity rules (i.e. dress codes), but enjoy the flexibility and oftentimes low hierarchy structures of these companies.

Comparing the entrepreneurial (both E and NE joined) and student sample in relation to their value scores, we find the two groups to significantly differ on the values of self-direction ($M_{prof.}$= 5.4; $M_{student}$ = 4.4 ; p=0.00), security ($M_{prof.}$= 2.83; $M_{student}$ = 3.69 ; p=0.00), tradition ($M_{prof.}$= 2.3; $M_{student}$ = 2.9 ; p=0.01) and conformity ($M_{prof.}$= 3.5; $M_{student}$ = 4.0 ; p=0.01). The direction of differences makes thereby sense: security and, tradition and conformity are of less relevance within the entrepreneurs' value system, reflecting the generally disruptive, uncertain and innovative aspects of the entrepreneurial environment. At the same time, self-direction seems to be an essential and highly valued aspect for the group of entrepreneurial professionals, in particular the entrepreneurs. Detailed results of the outcome between the groups can be obtained from the Appendix.[34]

Entrepreneurial Self-Efficacy

Weitzel et al (2010) find individuals to differ significantly in their contribution behaviour towards others, based on their *type* of entrepreneurial self-efficacy (i.e. business vs. creative talent). Consequently, we control for these aspects in our experimental design. For measuring entrepreneurial self-efficacy, we collect the same items as done in their research paper (based on Wilson et al. 2007, Zhao et al. 2005, and Monsen[35]). In total 12 items are collected, (please refer to the Appendix for the listing and wording of the items). On a seven-point Likert-scale, subjects had to rate their confidence regarding their ability to perform creative or business tasks (i.e. ability to be creative; ability to manage money, etc.) *relative* to their peers. For validation purposes, we run a principal factor analysis, producing two factors with eigenvalues close to (0.93) or above 1. In line with Weitzel et al. (2010) and other past research (see Danziger et al., 2008; Chen et al., 1998; Long, 1983), proposing managerial talent and creativity to be distinct constructs, we find the two factors to load on creative and business scales respectively (i.e. creativity factors load highly negative on the second factor). Next, we run principal factor analysis on the 10-business talent (BT) items of the self-efficacy scale and find only one factor with an eigenvalue above 1. We consequently split the business and creativity items into two distinct factors: Creative talent (CT) (2 items, α=0.87) and Business Talent (BT) (10 items, α=0.82)[36]. These two factors will later

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[34] Note: The parametric (t-test) and non-parametric tests give the same results in terms of significance. An exception is on the item of universalism, where we find a sig. difference when looking at the Wilcoxon test (p=0.04) but not the t-test (p=0.16). Professionals score thereby higher than the students. While we do keep the finding in mind, we do not want to overinterpret it, as we consider the aspect of other-regarding preferences – which universalism has been linked to-in more detail at a later stage of the paper.

[35] The items by Monsen were suggested verbally during the study (see Weitzel et al, 2010 for details).

[36] Whereby the ability to manage money presents a reversed item – also in the study by Weitzel et al. This item is an item with weak loadings.

be employed for testing their respective impact on contribution behaviour, to compare the results to those of Weitzel et al. (2010).

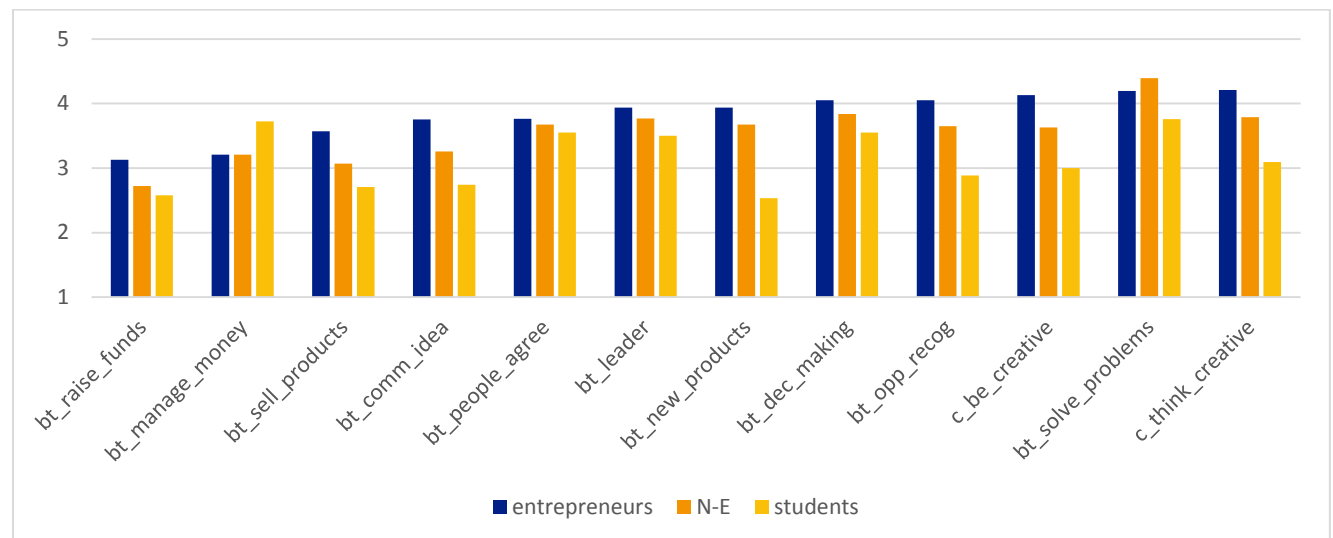*Figure 1: Mean values of entrepreneurial self-efficacy (12 items) by group.*

Figure 1 above shows the mean scores of the self-efficacy items for the professional crowd (separately for entrepreneurs and non-entrepreneurs) as well as the student sample. Thereby, the order of skills represents the ability ranking of the entrepreneurs, i.e. on average, they regard their ability (in comparison to their peers) lowest on the item of "raising funds" (M= 3.1) and highest on "thinking creative" (M= 4.2). Entrepreneurs' (E) ratings are the highest on almost every item of the scale higher, except on the item of "problem solving" (where NE score marginally higher) and "managing money"[37] (where students rate themselves higher than both E & NE). These findings are not surprising, given that the scale reflects *entrepreneurial* self-efficacy. We apply a Kruskal-Wallis equality-of-population rank test, to check whether the results differ across the three groups (E, NE & S). We find, except for the item "get people to agree with you" (p=0.53), the tests to be (highly) significant on all other items.[38]

Running the analysis separately for the BT and CT items (based on the results of the factor analysis) with the professional sample, we find significant differences on the average rating of the 10 BT items between entrepreneurs M_E=3.76 and non-entrepreneurs M_{NE}=3.53 (p= 0.02) and highly significant differences on the CT scale (p<0.01).[39] Looking at the individual items, we find highly significant differences (p<0.01) on both individual items of the creative factor (CT). Entrepreneurs regard their creative abilities in relation to their peers' as significantly better than their non-entrepreneurial counterparts.[40] We also find some significant

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[37] Note: this item is a reversed item in the internal reliability analysis.
[38] No p value exceeds >0.02; For a summary of the results check the Appendix
[39] The two-sample t-test and Mann Whitney U test give identical results.
[40] (M=4.2 (S.D.=0.108) vs. M=3.8 (S.D. =0.100); p=0.005 for the item of "thinking creative"; M=4.1 (S.D. =0.108) vs. M=3.6 (S.D.=0.128), p=0.003 for the item „being creative").

differences on the individual business talent items:[41] In particular in skill-sets strongly related to business venturing, such as identifying opportunities, raising funding, commercializing ideas and selling products entrepreneurs consider their skills more superior (in relation to their peers) in comparison to the NE group.[42]

An additional explanation for observing the consistently higher ratings of the entrepreneurs on this scale (especially on items less related to exclusively entrepreneurship but business in general), might relate to the fact that entrepreneurs have been shown to exhibit inflated levels of confidence (Köllinger et al. 2007).[43]

Conferences

Before analysing the "games section" of our experiment, we checked if the data of the two conferences could be merged. We thereby compared the behaviour of both dictator games, as well as the first round of the public good game. The first round of the public good game is analysed separately from the other rounds of the game, as it constitutes an initial condition to cooperation (first-period play) and is unrelated to any learning (they may at best guess what the counterparty will do). As only the high-stake treatment was carried out at the ECFI, we applied also only the high-stake data from the TOA within this analysis, in order to avoid any potential confounding effects in relation to treatment size and conference type.

Results of all games show, using a Wilcoxon rank sum test, no significant differences in the contribution behaviours of the ECFI and the TOA (Results for DG1: M=6.89, S.D.=3.34 and M=6.8, S.D.=3.95 respectively; z= 0.13, p=0.89. Results for DG 2: M=8.01, S.D.=6.41 and M=7.22, S.D.= 3.81 respectively; z=0.367; p=0.71. Results Public Good Game: M=14.39, S.D. = 5.83 and M=12.21, S.D. = 6.55 respectively; p=0.13).[44] We consequently merge the data across the conferences and proceed with the analysis.

Results Dictator Game 1 and Dictator Game 2

In this section, we describe the results between factors, stake and group types, for the first (DG1) and second (DG2) dictator game, separately. As we join the low and high stake data in the following, we run the analysis on the variable of contribution to the receiver as percentage of total endowment.

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[41] On some of the BT no (significant) differences are observable across the groups of entrepreneurs and non-entrepreneurs (i.e. on the items ability to solve problems, manage money, get people to agree with you, being a leader, make decisions and create new products no differences are found).

[42] Opportunity recognition: E: M=4.05 (S.D. = 0.101) vs. NE: M=3.65 (S.D. =0.140); p=0.02. Fund raising: E: M=3.1 (S.D. =0.123) vs. NE: M=2.72 (S.D. =0.153); p=0.04. Commercializing ideas: E: M=3.7 (S.D. =0.118) vs. NE: M=3.25 (S.D. =0.141); p<0.01. Selling products: E: M=3.57 (S.D. = 0.14) vs. NE: M=3.07 (S.D. =0.15); p=0.01.

[43] Comparing the results to Weitzel et al. (2010) we find, that the student population rated themselves even higher than our entrepreneurial sample, in relation to BT and CT. We presume that this might be driven by the fact that the questions ask to compare yourself to your peers, and that the comparison to other professionals within the same industry and fellow students, who might not even study in a business-related field, could drive this difference.

[44] Using simple regression analysis, with contributions made to the receiver as the dependent variable, and controlling in addition to conference type also for group type (dummy variable termed "entrepreneur") and gender, we find no significant relationship between the contribution behaviour and conference type for both dictator games and the contribution behaviour in the public good game.

Starting with the first dictator game, we run a Kruskall-Wallis equality of populations rank test between the three groups (E, NE and students) confirming the groups to differ from each other (p=0.02 for both stakes, p=0.01 for low stakes) in relation to their donation behaviour.

Table 2: Summary Statistics Dictator Game 1

Dictator Game 1						
Allocation (in % of endowment) of dictator to receiver.						
	Obs	Mean	Std. Dev.	Min	Max	Wilcoxon Rank Sum Test
E	35	38.31%	17.54%	0	0.6	z=1.859; p=0.06
NE	25	31.60%	19.13%	0	0.75	
H-E	23	34.65%	17.95%	0	0.5	z=0.6 ; p=0.54
H-NE	18	33.89%	18.28%	0	0.75	
L-E	12	45.33%	15.00%	0	0.6	z=2.154; p=0.03
L-NE	7	25.71%	21.49%	0	0.5	
Students	32	26.38%	24.72%	0	0.98	

In a next step, we more closely investigate the differences between the individual groups. Table 2 summarizes the results of the individual groups' allocation behaviour. Comparing the two sub-groups of our professional sample, using Wilcoxon rank sum tests, we find entrepreneurs to allocate overall more to the receiver than the non-entrepreneurs (M_E=38.31%; M_{NE}= 31.60%; z=1.86, p=0.06). However, this difference is driven by a large divergence of the groups' contribution behaviour in the low stake case: Entrepreneurs allocate about 20% more of their endowment to the receiver than the NE group in this scenario (z=2.15, p=0.03). Due to the small number of observations driving this result (n=19), we refrain from placing a too strong emphasis on the potential meaning of these findings[45]. Looking at the high-stake treatment (n=41), we see entrepreneurs and non-entrepreneurs to allocate very similar amounts to the receiver (M_E=34.65%; M_{NE}= 33.89%; z=0.6, p=0.54). Consequently, we are unable to make definite statements as to whether the behaviour of these two groups differ in the DG1. While we do see entrepreneurs to behave at least as generous as NE in DG1, the variation of behaviour in relation to stake size is something that needs to be investigated in more detail in future research. Comparing the donation behaviour of entrepreneurs and students (E vs. S), we find entrepreneurs to allocate significant more money to the receiver, regardless of stake size, using a Wilcoxon rank sum tests (z=2.61, p=0.01 for both stakes; z=3.00, p=0.003 for low stakes). On average entrepreneurs allocate about 10 percent more of their endowment to their counterparty than the student sample (M_E=38.31%; $M_{Students}$= 26.38 %).[46]

To confirm the above outlined results, we run tobit regressions (censored at zero), with the dependent variable presenting the allocation (as percentage of the endowment) to the receiver, controlling additionally for gender and stake size.[47] Results confirm the above outlined results (please refer to the Appendix for the exact results

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[45] Note: We did not expect such a change in behavior due to stake size. Further research needs to establish whether the observed profound changes due to sample size can be replicated, and potential reasons underlying this.

[46] We also join the professional sample (NE & E) and compare their contribution behavior to the students. Again, results show that students behave different to the professional crowd, by allocating significantly less ((z=2.17, p=0.03 for both stakes; z=2.28, p=0.02 for low stakes).

[47] We also run the regressions separately for respective stake sizes, where applicable.

of the regressions). While we find males to generally allocate less to the receiver than their female counterparts[48], in line with past findings (Eckel and Grossman, 1998), the stake size dummy is insignificant.

Moving to the results of the second Dictator Game (DG2), we run a Kruskall-Wallis equality of populations rank test between the three groups (E, NE and students), confirming again that the three groups differ from each other in relation to their allocation choices (p=0.000 for both stakes, p=0.007 for low stakes). Table 3 below summarizes allocation choice statistics by groups.

Table 3: Summary Statistics Dictator Game 2

Dictator Game 2						
Allocation (in % of endowment) of Dictator to Receiver						
	Obs	Mean	Std. Dev.	Min	Max	Wilcoxon Rank Sum
E	42	35.05%	25.37%	0	1	z=0.409; p=0.68
NE	18	42.28%	28.84%	0	1	
H-E	32	38.03%	25.51%	0	1	z=0.148; p=0.88
H-NE	9	39.44%	33.11%	0	1	
L-E	10	25.50%	23.62%	0	0.5	z=1.377; p=0.16
L-NE	9	45.11%	25.56%	0	1	
Students	32	14.92%	19.10%	0	0.5	

The behaviour in the second dictator game is in many ways similar to the behaviour observed in the first Dictator Game (DG1), including the somewhat hard to interpret findings in case of low stake sizes. In the high-stake treatment, entrepreneurs and non-entrepreneurs again allocate very similar amounts towards their counterparty (M_E=38.03%; M_{NE}=39.44%; z=0.148, p=0.88). In comparison to the contributions in the first Dictator Game (concerning the high-stake treatment only), contributions increased by about 10 percent for the entrepreneurs and 15 percent for the non-entrepreneurs.

In the low stake treatment, we have, as in DG1, a notable, albeit statistically insignificant[49], difference between the allocation behaviour of E and NE (M_E=25.50%; M_{NE}=45.11%; z=1.38, p=0.16). Remarkably, the tendency of contributions in relation to DG1 has changed in reversed ways: While entrepreneurs give about 44 percent less in relation to DG1, NE increased their relative contributions by 44 percent from DG1 to DG2. Again, confirmation of these results via larger sample sizes would be needed to allow for a sensible and reliable interpretation of these results. One potential reason of observing this reversed behaviour could be the experience subjects made while playing the public good game, and this consequently affecting their allocation choices in DG2. We discuss the possibility of this in more detail, after presenting the results of the public good game. However, it is unclear why this should prevail only in the high stake and not in the low stake case. As we did not design our experiment anticipating this finding, we cannot explain this remarkable result.

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[48] Only in the regression, run seperately for the dummy E vs. NE in the high stake scenario we obtain a gender dummy coefficient of zero.

[49] Most likely due to sample size.

Comparing the allocation behaviour of the entrepreneurs in DG2 to the students', we observe, in line with the results of DG1, students to allocate significantly lower amounts (M_E=35.05%; $M_{Students}$= 14.92 %; z=3.46, p=0.000).[50] The Tobit regressions, performed in the same manner as for DG1, again confirm the above results. As our paper also aims to test the validity of using individuals (in particular business and economics students) scoring high on entrepreneurial intent as a proxy for entrepreneurs (or reflecting entrepreneurial behaviour), we run regressions separately with the students, controlling for the impact of entrepreneurial intent and self-efficacy (as a construct overall and split into business and creative talent). The results are shown in table 4 below (for DG1 and DG2 separately). We find neither entrepreneurial intent nor entrepreneurial self-efficacy to play a significant role in explaining students' allocation behaviours in the first dictator game.

Table 4: Tobit regressions DG 1 and DG 2: Student sample only

Individual contributions (as % of endowment): tobit regressions for % of endowment send to the receiver

	Dictator Game 1 (DG1)		Dictator Game (DG2)	
	Student sample		Student sample	
	Self Efficacy	BT & CT	Self Efficacy	BT & CT
Male	-0.223	-0.201	-0.203*	-0.195*
	(0.133)	(0.139)	(0.109)	(0.107)
Entrepreneurial Intent	-0.0375	-0.0333	0.172**	0.158**
	(0.0605)	(0.0611)	(0.0692)	(0.0704)
Entrepreneurial Self-Efficacy	-0.0941	-	-0.0652	-
	(0.144)		(0.100)	
Business Talent (BT)	-	0.0330		0.0385
		(0.0965)		(0.0703)
Creative Talent	-	-0.116		-0.0874
		(0.140)		(0.0934)
Constant	0.662	0.596	-0.0346	-0.0386
	(0.407)	(0.425)	(0.297)	(0.291)
Sigma	0.332***	0.332***	0.261***	0.257***
	(0.0578)	(0.0579)	(0.0512)	(0.0504)
Number of individuals	32	32	31	31
Log Likelihood	-16.12	-15.98	-10.96	-10.70
LR χ2	5.51	5.49	8.99	9.51
(Prob.>χ2)	0.16	0.24	0.03	0.05
Obs. censored at zero	12	12	15	15

Standard errors in parentheses
p<.1, ** p<.05, *** p<.01

In DG2, we can confirm the finding in Urbig et al. (2012) that entrepreneurial intent has a significant positive influence on the contribution behaviour (β= 0.17, p=0.019), while entrepreneurial self-efficacy (also when split into the factors of BT and CT) still has no impact on the contribution levels as suggested by the results of Weitzel et al. (2010) and Urbig et al. (2012). Recall, they found business talented students to be less giving than

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[50] Again, results show that students behave also different to the professional crowd (E & NE), by allocating significantly less ((z=3.96, p=0.000 for both stakes; z=2.81, p=0.005 for low stakes).

the other students. Possibly, this is because our student sample was recruited from business and economics students only, whereas in these earlier studies the student samples were more mixed. However, as we did not also recruit non-economics students, we cannot prove that hypothesis here.

Results Cooperation Game

Table 5 below shows the average contribution behaviour per round for the three groups respectively. When looking at subjects' contribution levels in the public good game, we observe generally similar contribution trends over time in relation to past public good game research. Usual average contribution levels from past research amount to approximately 50% of the endowment (see e.g. Cookson, 2000; Croson, 1996 and Andreoni, 1988) and then decline over the periods of play. We observe (very) high initial contribution levels within our professional sample, starting between 55 % in the H-NE group, 65% for L-E, and 73 % in both the L-NE and H-E groups[51]. From the first to the last round, contributions decline between 14% (L-E) and 24% (L-NE), in line with past research (Isaac and Walker, 1988; Ledyard, 1995, Andreoni, 1988, Fehr and Gächter, 2000). However, due to the high initial levels of cooperation, we also end up with high *average* contributions of 49% in the last round (52% for entrepreneurs; 45% for non-entrepreneurs) – this is in comparison to e.g. 18.1 % in Andreoni and Petrie (2004) and 10.6 % in Croson (1996). While the student sample starts with a lower average contribution levels ($M_{students(Rd.1)}$=54.22%) in comparison to the professional sample, the level declines by only 6 percentage points across the 10 rounds to $M_{students(Rd.10)}$= 47.8%, higher than for the NE group ($M_{NE(Rd.10)}$=43.7%). None of our treatments thus drops to complete free riding. We observe entrepreneurs to make consistently higher allocation choices in comparison to the students and NE of the professional crowd.

Graph 1: Average contribution to the project by round and group.
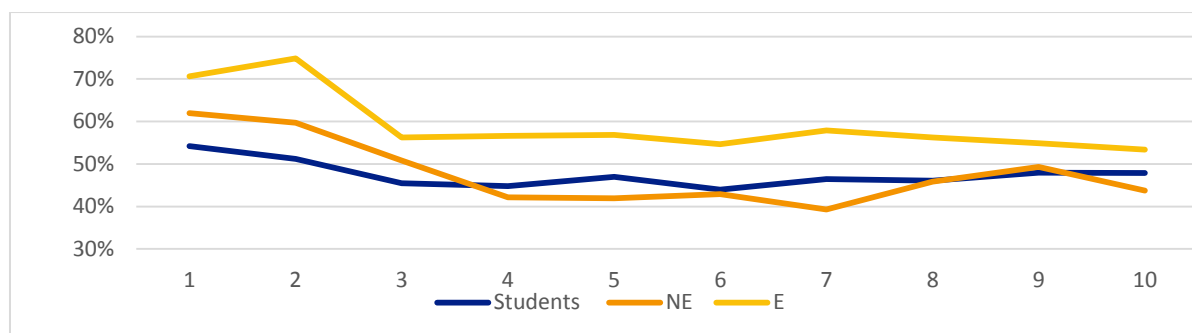
Overall, we see entrepreneurs to allocate on average M_E =59.22% of their endowment, while non-entrepreneurs allocate M_{NE}= 47.77 % to the joint project. This difference is significant using a Wilcoxon Rank sum test (2.171; p=0.03). Random-effects Tobit regressions confirm the result of entrepreneurs' higher

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[51] The average contribution across all rounds varies between 48% (L-NE) and 61% (L-E). In comparison to past research, these contribution levels are noticeably high (e.g. 44.07% Andreoni 1995; 30.3% Andreoni & Petrie, 2004; 33.2 % for Andreoni, 1988, 35.7 % Croson 1996). Figure 3 in the Appendix summarized the average contribution levels of the professional sample by group (E vs. NE) and stake size.

contribution levels to the project (β=0.24, p=0.025) while controlling for stake size (p=0.844), gender[52] and a proxy for conditional cooperation[53] (β=0.561, p=0.000).

Comparing entrepreneurs' average contribution level to that of the student sample ($M_{Student}$= 47.47%), we find entrepreneurs to allocate significantly more of their endowment to the project (p=0.05; z=2.00), while students do not differ in their behaviour in relation to the NE group (p=0.83; z=0.124).

To get a better understanding of our sample and their respective cooperative behaviour, we classify subjects' behaviour based on their initial level of contribution, given by their contribution in the first round of the cooperation game. Classification regarding cooperative dispositions has been suggested as useful. Andreoni (1995) for example argues that the regularly observed decline of contributions over multiple rounds in the public good game is due to co-operators becoming discouraged by their free riding counterparties. Kurzban and Houser (2005) divide their subjects into co-operators, free-riders and reciprocators, based on their endowment proportion contributed to the pool, and their reaction to their co-players contributions. Their findings suggest stable individual differences in cooperative dispositions. Thereby, it should be noted that the literature does not provide a clearly defined theoretical cut-off point determining whether an individual classifies as free rider or co-operator. Hence, splitting our sample into such types of group classifications involves some degree of arbitrariness. We follow the approach of Isaac and Walker (1988) and classify someone as a "co-operator", if the contribution in the first round of the cooperation game exceeds 33 percent of the endowment; otherwise, (contributing 33 percent or less) subjects are classified as "free rider". A similar approach has been used by Gunnthorsdottir (2007) – where the cut-off value was set at 30 percent.[54]

Table 5 below shows the distribution of the types across our group factor.[55] The chi-squared test for difference in distributions between the groups is significant (p= 0.05). Findings show that we have more free riders in the sub-group of non-entrepreneurs and students, and more entrepreneurs in the "co-operator" classification.[56] Again, this confirms our previous analyses of identifying the group of entrepreneurs as more cooperative within the game.

Table 5: Classification of subjects into Co-operators and Free riders by Group & Results of Chi Square test.

	Entrepreneurs (E)	Professionals (NE)	Students	Total
Freerider (n)	10	12	17	39
(expected frequency)	16.5	9.2	13.3	39
Cooperator (n)	67	31	45	143
(expected frequency)	60.5	33.8	48.7	143
Total	77	43	62	182

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[52] While males contribute less, the coefficient is insignificant p=0.38

[53] Conditional cooperation is measured by the counterparty's contribution level in t-1 (see e.g. Croson et al. (2007) for the same approach).

[54] Similar results are obtained using this method (Chi-Squared test, p=0.05)

[55] Values "below" are expected values based on the null hypotheses of Pearson's Chi-squared test.

Pearson chi2(1) = 5.65   p=0.05
Fisher's exact   p=0.05

Running regressions on the student sample only (see Table 6 below), in order to evaluate the influence of entrepreneurial intent and self-efficacy on the contribution behaviour in the cooperation game (in the same way as performed for DG 1 and DG2), we find the coefficient of entrepreneurial intent to be negative (contradicting the results we obtained for the entrepreneur (E) sample) and insignificant (β=-0.04, p=0.16). Also, in line with the findings of both dictator games, the coefficient of entrepreneurial self-efficacy is not significant (p=0.21) (also when split into the constructs of BT (p=0.19) and CT (p=0.13)).

Table 6: Tobit random effects panel regression data – Cooperation Game, Student sample only.

Individual contributions (as % of endowment contributed to the project): Tobit random effects panel regressions

Variable	Student sample	
	Self Efficacy	BT & CT
Conditional Cooperation	0.787***	0.783***
	(0.0936)	(0.0932)
Male	-0.0121	0.0294
	(0.204)	(0.205)
Entrepreneurial Intent	-0.0736	-0.0833
	(0.106)	(0.106)
Entrepreneurial Self-Efficacy	0.137	-
	(0.209)	
Business Talent (BT)	-	0.0250
		(0.191)
Creative Talent	-	0.157
		(0.131)
Constant	-0.133	-0.251
	(0.598)	(0.602)
Number of observations	589	589
Obs. censored at 0	206	206
Obs. censored at 1	178.00	178.00
Log Likelihood	-284.97	-284.43
Wald χ2	71.48	73.51
(Prob.>χ2)	0.00	0.00
Error Components:		
σ_u	0.737	0.728
σ_e	0.351	0.3513
ρ	0.8148	0.811

Standard errors in parentheses
p<.1, ** p<.05, *** p<.01

Discussion

We find entrepreneurs to be indeed more willing to share and cooperate than non-entrepreneurial professionals and, importantly, than economics and business students.[57] These findings suggest standard economic approaches, which pay no or little attention to the influence of social and cooperative attitudes (but rather assume the entrepreneur to act as a self-interested individual with the only objective of maximizing profits), to ignore important information, which could help us to better understand the entrepreneur. In particular, in relation to their decision-making processes it seems essential to widening our assumptions this way. Grasping the complexity of entrepreneurial motivations and preferences can thereby offer not only insights for policy makers but also increase our understanding for the formation of social entrepreneurship. Accounting for the presence of social and other-regarding preferences, such as the willingness to cooperate thereby seems a viable starting point.

The findings of our experiment also indicate potential problems of deducting experimental findings sampled from business and economic students to the population of professional entrepreneurs, as frequently done in entrepreneurship studies (e.g. Segal, Borgia, Schoenfeld, 2002). The construct of entrepreneurial intent (EI), regularly used as a proxy for classifying subjects as "entrepreneurs" produced only in the second dictator game consistent results with those obtained for the entrepreneurs. In DG1 and the Cooperation Game, the level of EI did not significantly relate to observed contribution levels. Furthermore, our results suggested students scoring high on entrepreneurial intent to allocate *less* of their endowment to the receiver/project, contradictory to the actual findings obtained for the entrepreneurs. There hence seem to be considerable generalizability issues when using student samples as proxies for entrepreneurs. Researchers should, despite higher costs and recruitment efforts, venture out into the field to reproduce their results with actual entrepreneurs to draw more reliable conclusions.

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[57] Future research needs to further investigate on the findings we obtained in the Dictator Games in relation to sample size. While past research has investigated stake sizes in relation to contribution behaviour, our findings imply that stake sizes might matter more than expected in this regard.

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Appendix

Experimental Design: Questionnaire – Scale and item descriptions.

World Values Survey – (WVS)

Subjects were asked to rate on 6 point Likert scale whether item's description is: 1 ('not at all like me') to 6 ('very much like me')

Value	WVS Item	Defining Goal (Schwartz, 2012 (p.5)
Universalism	Looking after the environment is important to this person; to care for nature.	Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.

Benevolence	It is important to this person to help the people nearby; to care for their well-being.	Preserving and enhancing the welfare of those with whom one is in frequent personal contact (the 'in-group').
Conformity	It is important to this person to always behave properly; to avoid doing anything people would say is wrong.	Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms.
Tradition	Tradition is important to this person; to follow the customs handed down by one's region or family.	Respect, commitment, and acceptance of the customs and ideas that one's culture or religion provides.
Security	Living in secure surroundings is important to this person; to avoid anything that might be dangerous.	Safety, harmony, and stability of society, of relationships, and of self.
Power	It is important to this person to be rich; to have a lot of money and expensive things.	Social status and prestige, control or dominance over people and resources.
Achievement	Being very successful is important to this person; to have people recognize one's achievements.	Personal success through demonstrating competence according to social standards
Hedonism	It is important to this person to have a good time; to "spoil" oneself.	Pleasure or sensuous gratification for oneself.
Stimulation	Adventure and taking risks are important to this person; to have an exciting life.	Excitement, novelty, and challenge in life.
Self-Direction	It is important to this person to think up new ideas and be creative; to do things one's own way.	Independent thought and action--choosing, creating, exploring.

Entrepreneurial Self-Efficacy -

Subjects were asked to rate their abilities in comparison to their peers on 5 point likert scale for the given items (1 = a lot worse; 5 = much better).

Item description	Source	Factor & Variable Name
solve problems	Wilson et al. 2007	bt_solve_problems
manage money	Wilson et al. 2008	bt_manage_money
be creative	Wilson et al. 2009	c_be_creative
get people to agree with you	Wilson et al. 2010	bt_people_agree
be a leader	Wilson et al. 2011	bt_leader
make decisions	Wilson et al. 2012	bt_dec_making
successfully identify new business opportunities	Zhao et al. 2005	bt_opp_recog
create new products	Zhao et al. 2006	bt_new_products
think creatively	Zhao et al. 2007	c_think_creative
commercialize an idea or new development	Zhao et al. 2008	bt_comm_idea
raise funds for a new business	Monsen / Weitzel et al. 2010)	bt_raise_funds
sell a new idea or service	Monsen / Weitzel et al. 2010)	bt_sell_products

Trust - (SOEP)	
Subjects were asked to rate the following statements.	
Item description	**Variable Name** (as found in Caliendo et al. 2010)
Main items: 4 point Likert Scale (1 = totally agree ; 4 = totally disagree)	
On the whole one can trust people (reversed item)	trustpeople
Nowadays one can't rely on anyone	canttrust

If one is dealing with stranger, it is better to be careful before you trust them	cautionstrangers
Supplementary Items (1) : 0=no (trust) ; 1 = yes (trust)	
Do you believe that most people would exploit you if they had the opportunity *(dfair=0)*, or would attempt to be fair toward you *(dfair=1)*?	dfair
Would you say that for most of the time, people attempt to be helpful *(dhelpful=1)*? Or only act in their own interests *(dhelpful=0)*?	dhelpful
Have you ever profited from the generosity of a person, who you had not previously met *(dprofitfromstranger=1; otherwise =0)*?	dprofitfromstranger
What would you say: how may close friends do you have? *(open scale question)*	numberfriends
Supplementary Items (2): 5 point Likert Scale (1 = very often ; 5 = never) **How often does it occur that…**	
…that you lend your friends your personal belongings (i.e. CDs, books, car, bicycle)?	lendbelongings
…that you lend your friends money?	lendmoney
…that you leave the door to your apartment unlocked?	doorunlocked

Experimental Results: Questionnaire – by group comparisons.

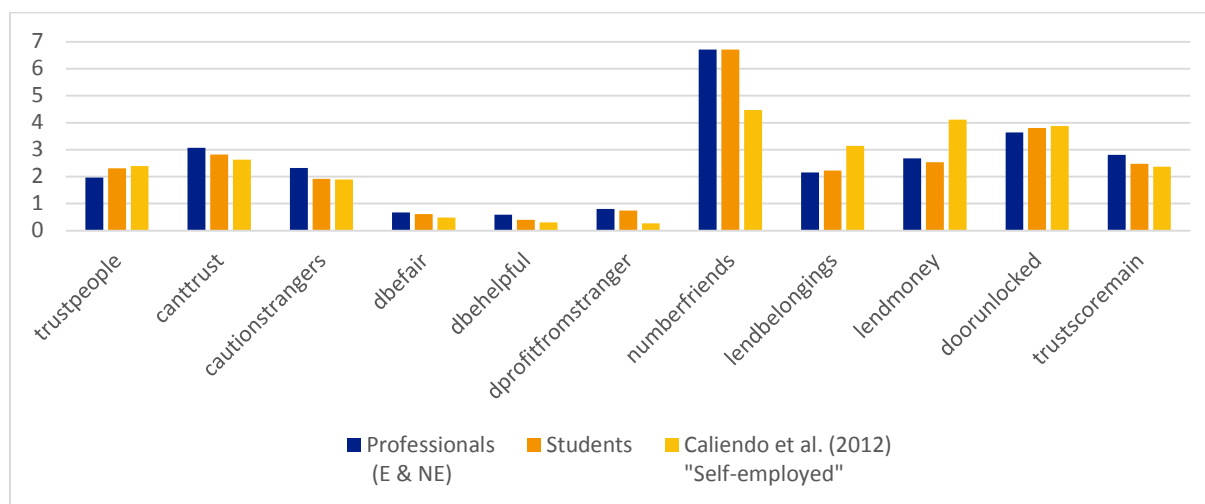*Graph 2: SOEP mean trust score values by group.*

Professionals (E & NE)   Students   Caliendo et al. (2012) "Self-employed"

Table 7: Trust - mean values by group. Parametric and non-parametric test results

Variable	Professionals (E & NE)	Students	Caliendo et al. (2012) "Self-employed"	Wilcoxon Rank Sum test (Professionals vs. Students): p-values	t-test (Professionals vs. Students): p-values
trustpeople	1.97	2.31	2.39	0.002	0.000
canttrust	3.08	2.82	2.63	0.027	0.033
cautionstrangers	2.33	1.92	1.89	0.001	0.001
dbefair	0.68	0.61	0.48	0.405	0.414
dbehelpful	0.59	0.40	0.31	0.016	0.016
dprofitfromstranger	0.80	0.74	0.26	0.371	0.388
numberfriends	6.72	6.71	4.47	0.597	0.991
lendbelongings	2.16	2.23	3.14	0.870	0.661
lendmoney	2.68	2.53	4.11	0.332	0.336
doorunlocked	3.64	3.81	3.87	0.432	0.477
trustscoremain	2.81	2.48	2.37	0.000	0.000

Graph 3: World Values Survey – mean values by entrepreneurs and non-entrepreneurs
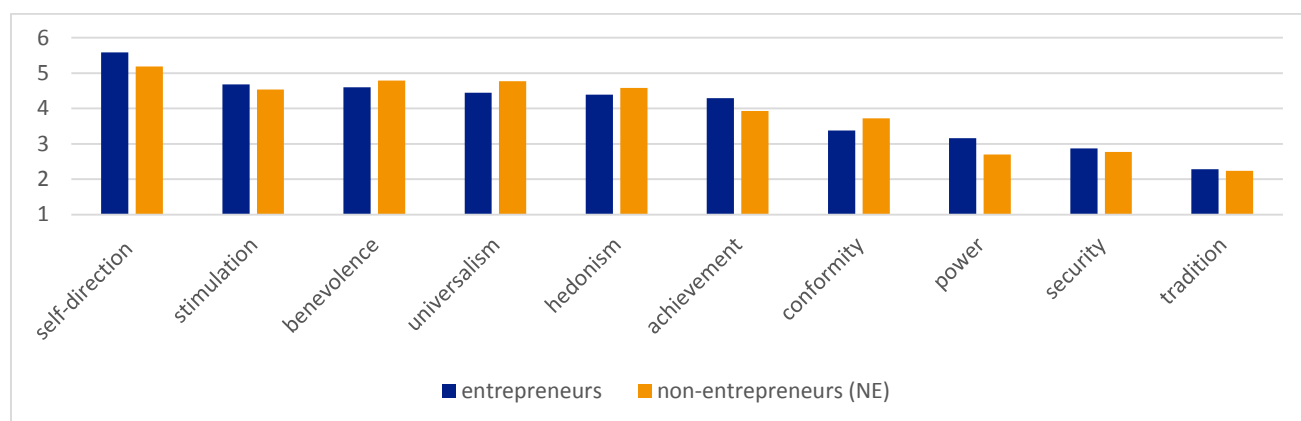
Graph 4: World Values Survey – mean values by professionals (E +NE) and non-entrepreneurs (NE)
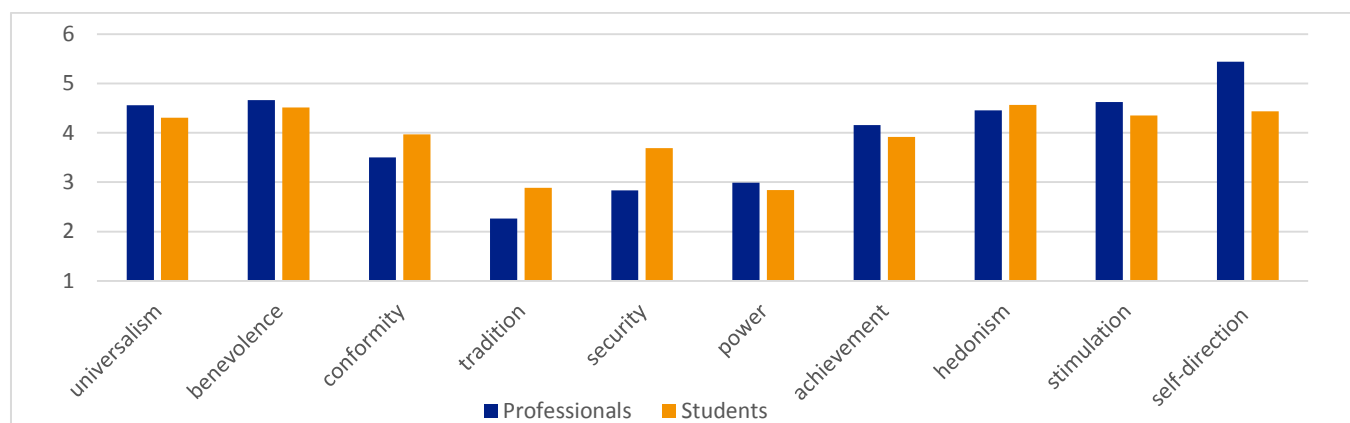
Table 8: World Values Survey - mean values by group. Parametric & non-parametric test results

Variable	Professionals	Students	Wilcoxon Rank Sum test (Professionals vs. Students): p-values	t-test (Professionals vs. Students): p-values
universalism	4.56	4.31	0.04	0.17
benevolence	4.67	4.52	0.21	0.34
conformity	3.50	3.97	0.03	0.05
tradition	2.27	2.89	0.01	0.01
security	2.83	3.69	0.00	0.00
power	2.99	2.84	0.56	0.44
achievement	4.16	3.92	0.20	0.25
hedonism	4.46	4.56	0.58	0.56
stimulation	4.63	4.35	0.13	0.19
self-direction	5.44	4.44	0.00	0.00

Variable	Entrepreneurs	N-E	Students	Professionals
bt_raise_funds	3.13	2.72	2.58	2.98
bt_manage_money	3.21	3.21	3.73	3.21
bt_sell_products	3.57	3.07	2.71	3.39
bt_comm_idea	3.75	3.26	2.74	3.58
bt_people_agree	3.77	3.67	3.55	3.73
bt_leader	3.94	3.77	3.50	3.88
bt_new_products	3.94	3.67	2.53	3.84
bt_dec_making	4.05	3.84	3.55	3.98
bt_opp_recog	4.05	3.65	2.89	3.91
c_be_creative	4.13	3.63	3.00	3.95
bt_solve_problems	4.19	4.40	3.76	4.27
c_think_creative	4.21	3.79	3.10	4.06

Table 9: Entrepreneurial self-Efficacy - mean values by group.

Findings DG game

Table 10: Tobit Regressions DG 1

Dictator Game 1: Individual contributions (as % of endowment): tobit regressions

Variable	Entrepreneur vs. Non-Entrepreneur			Entrepreneur vs. Students	
	All Stakes	High stakes	Low stakes	All stakes	Low stakes only
Entrepreneur	0.134**	0.00647	0.194*	0.245***	0.259**
	(0.0575)	(0.0698)	(0.0926)	(0.0866)	(0.0991)
Male	-0.119**	0.00787	-0.112	-0.144**	-0.196**
	(0.0554)	(0.0642)	(0.0897)	(0.0688)	(0.0911)
High stake-size	0.0460	-	-	-0.0612	-
	(0.0565)			(0.0924)	
Constant	0.294***	0.327***	0.309***	0.271***	0.281***
	(0.0452)	(0.0598)	(0.0959)	(0.0544)	(0.0647)
Sigma	0.246***	0.193***	0.187***	0.250***	0.284***
	(0.0216)	(0.0232)	(0.0349)	(0.0261)	(0.0392)

		92	41	19	67	44
Number of individuals		92	41	19	67	44
Log Likelihood		-21.175438	2.97756	0.487	-16.83435	-16.911
LR χ2		9.85	0.03	6.27	11.88	10.01
(Prob.>χ2)		0.01	0.98	0.0436	0.00	0.00
Obs. censored at zero		19	4	3	15	13

Standard errors in parentheses

p<.1, ** p<.05, *** p<.01

Table 11: Tobit Regressions DG 1

Dictator Game 2: Individual contributions (as % of endowment): Tobit regressions

Variable	Entrepreneur vs. Non-Entrepreneur			Entrepreneur vs. Students	
	All Stakes	High stakes	Low stakes	All stakes	Low stakes only
Entrepreneur	-0.0813	0.122	-0.337**	0.238*	0.189
	(0.0997)	(0.136)	(0.122)	(0.129)	(0.131)
Male	-0.106	-0.349*	0.148	-0.211*	-0.128
	(0.135)	(0.204)	(0.147)	(0.108)	(0.117)
High stake-size	0.0628	-	-	0.176	-
	(0.0867)			(0.110)	
Experience in PG	-0.570***	0.122***	-0.462**	-0.641***	-0.657**
	(0.174)	(0.136)	(0.158)	(0.192)	(0.265)
Constant	0.441***	0.558***	0.385***	0.137*	0.102
	(0.114)	(0.163)	(0.110)	(0.0738)	(0.0786)
Sigma	0.292***	0.303***	0.216***	0.285***	0.284***
	(0.0319)	(0.0402)	(0.0415)	(0.0319)	(0.0475)
Number of individuals	60	41	19	73	41
Log Likelihood	-21.9057	-15.951	-1.8693	-27.77	-16.53
LR χ2	11.99	7.67	12.26	27.9	10.63
(Prob.>χ2)	0.01	0.05	0	0.00	0.01
Obs. censored at zero	13	13	4	26	19

Standard errors in parentheses

p<.1, ** p<.05, *** p<.01

Findings: Cooperation Game

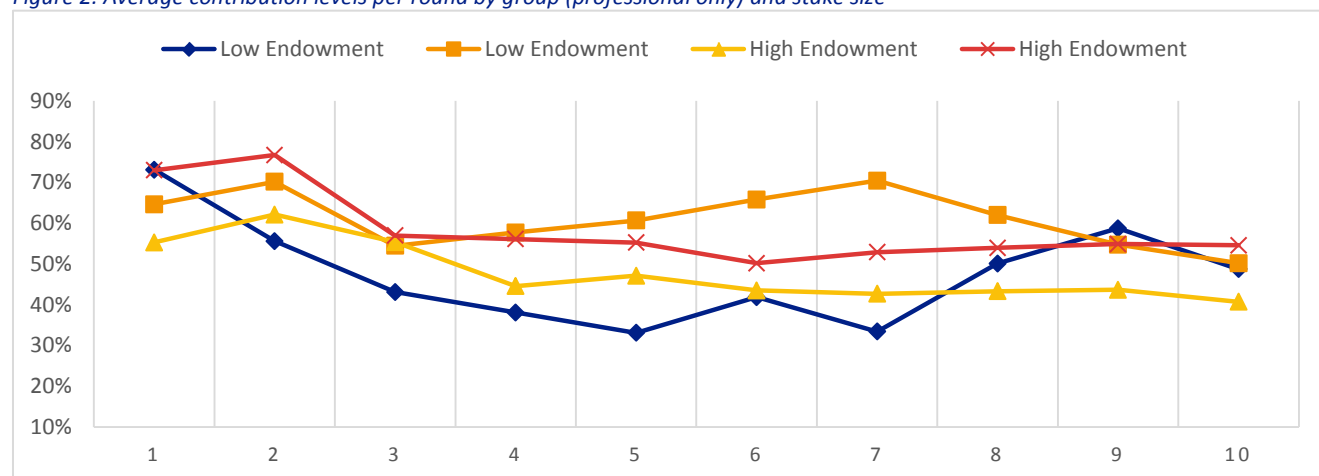*Figure 2: Average contribution levels per round by group (professional only) and stake size*

Table 12Tobit Random Effects Panel Regressions -Cooperation Game

Individual contributions (as % of endowment contributed to the project): Tobit random effects panel regressions

Variable	Entrepreneur vs. Non-entrepreneur			Entrepreneur vs. Students	
	All Stakes	High stakes	Low stakes	All stakes	Low stakes
Conditional Cooperation	0.561***	0.476***	0.780***	0.614***	0.783***
	(0.0600)	(0.0670)	(0.130)	(0.0608)	(0.0811)
Entrepreneur	0.243**	0.218*	0.278	0.173	0.121
	(0.108)	(0.127)	(0.220)	(0.178)	(0.192)
Male	-0.108	-0.0910	-0.118	0.00267	0.0217
	(0.123)	(0.151)	(0.233)	(0.144)	(0.171)
High stake-size	0.0211	-	-	0.0105	-
	(0.107)			(0.177)	
Constant	0.222*	0.285**	0.0971	0.180	0.0998
	(0.130)	(0.136)	(0.231)	(0.114)	(0.128)
Number of observations	1140	779	361	1324	797
Obs. censored at 0	247	155	92	347	246
Obs. censored at 1	356	232	124	443	263
Log Likelihood	-936.85	-624.10	-306.51	-925.65	-473.16
Wald χ2	94.53	53.89	39.37	105.79	95.16
(Prob.>χ2)	0.00	0.00	0.00	0.00	0.00
Error Components:					
σ_u	0.50	0.46	0.61	0.66	0.72
σ_e	0.52	0.49	0.62	0.62	0.43
ρ	0.48	0.47	0.50	0.66	0.74

Standard errors in parentheses

p<.1, ** p<.05, *** p<.01

Stakeholder Consultation Workshop Report

Christine Lauritzen

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M26

Submission date

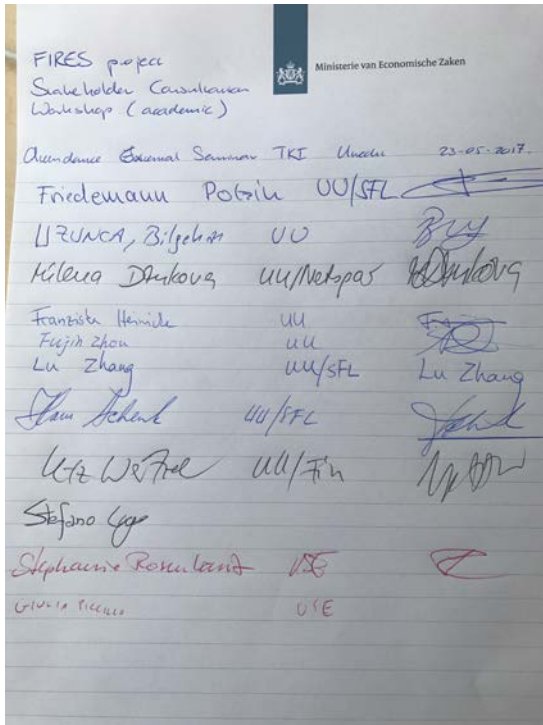26-05-2017

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Place, Date and Time

Utrecht, 23-05-2017, 11:00-12:00

Stakeholders

Academics attending the external research seminar series at Utrecht School of Economics, Utrecht University. In attendance were some 10-15 PhDs, PostDocs, assistant, associate and full professors from such diverse backgrounds as experimental economics, behavioural finance and entrepreneurship research. The (ad hoc) attendance list:

Friedemann Polzin (PostDoc, Sustainable Finance Lab)
Bill Uzunca (Ast. Prof, Entrepreneurship and Strategy)
Milena Dzukova (PhD-candidate)
Franziska Heine (PhD-candidate)
Fujin Zhou (PostDoc, International Macro)
Lu Zhang (PostDoc, Sustainable Finance Lab)
Hans Schenk (Professor of Strategy and Organisation)
Utz Weitzel (Professor of Finance)
Stefano Lugo (Ast. Prof. Finance)
Stephanie Rosenkranz (Professor of Theoretical Micro)
Guilia Piccillo (Ast. Prof. Finance)
Mark Sanders (Asc. Prof. Economics of Sustainability and Transition)

Format

The seminar was programmed in the regular academic seminar series of Utrecht School of Economics as below:

Dear all,

Tomorrow, May 23, **Christine Lauritzen**, PostDoc researcher in the FIRES-project will give a presentation entitled:
Cooperative and altruistic tendencies of entrepreneurs
Abstract:
A central question in entrepreneurship research is: Who is the entrepreneur? In the past, the field has focused on the role of environmental conditions (Gartner, 1988), psychological traits (e.g. Rauch & Frese, 2006) and behavioral aspects (e.g. Busenitz & Barney, 1997). However, studies measuring entrepreneurs' social preferences and/or their willingness to cooperate is scarce (Weitzel et al. 2010, Urbig et al. 2012), despite the fact that these two aspects are likely to considerably impact entrepreneurs' decision-making. Moreover, the manifestations of these factors are likely to have implications not only for the direct internal and external stakeholders of ventures but ultimately for society in general. We empirically investigate altruistic and cooperative tendencies of

entrepreneurs using game-theoretic concepts and discuss the resulting implications for an entrepreneurial context. We further aim to establish whether the behavior of entrepreneurs in these games significantly differs to the behavior of business and economic students in this regard.

The contact person for this seminar is Mark Sanders
The seminar will commence at 11.00 in the Green Room (ASH 2.13) and lunch will be served.

Main Question(s) put to the Stakeholder(s)

The general purpose of the seminar was to collect feedback and critically reflect on the approach and implications of the preliminary results as presented. In the context of the seminar excellent feedback was given by leading experts in behavioural finance and experimental economics on the implementation of the experimental design and the interpretation of results, while expert entrepreneurship scholars gave valuable feedback on how to interpret and report on the results in a more accessible and relevant way to an audience of non-experts.

Executive summary

After presenting the motivation, design of the experiment and the preliminary results the audience got engaged in a lively discussion on the study we have conducted.

In the context of the report we have implemented a "public goods game" and a dictator game. The name "public goods game" however, did raise some flags and comments, as this was understood as entrepreneurs caring for the public good, whereas in such a game they simply decide how much to invest of an endowment into a joint venture with their partner. After that confusion was cleared up, the results made more sense. The experimental economics experts worried about the small number of observations in the dictator games and asked why we did not implement a strategy design. This makes it hard to control for and disentangle order effects. Our reply that we initially wanted to investigate if experiences in the cooperation game would affect the behavior in the second dictator game.

Follow Up

The fact that the discussion was very focused on these rather technical aspects, gives the impression that the audience at least accepts the relevance and general set-up of the study. This gives us confidence that the design and implementation stand the test of academic rigor. The discussion on how to phrase and formulate the interpretation of our results told us to carefully avoid jargon from game theory and describe our results in a very general vocabulary.

Policy Brief on Social and Corporate Responsibility and Governance in young SMEs

Christine Lauritzen, Mark Sanders and Hans Schenk

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Policy brief on Social and Corporate Responsibility and Governance in Young SMEs

Authors: *Christine Lauritzen, Mark Sanders and Hans Schenk*

increasingly recognize the importance of taking a role in addressing the many challenges the world faces today. We investigated whether strengthening the entrepreneurial economy would risk weakening the trend towards more CSR because young and small enterprises are perhaps less able or inclined to maintain high levels of CSR. Results from a lab experiment in the field have shown there is little to worry about. There is an urgent need, however, to strengthen the knowledge base by mapping entrepreneurs' social attitudes and linking these to their CSR behavior. Furthermore, we argue for developing entrepreneurship policies that promote more sensitivity to CSR.

Introduction

The world is facing urgent challenges. Population growth, climate change and energy transition all pose challenges governments alone simply cannot address. The global move towards corporate social responsibility (CSR) has seen large multinational corporations engage with these challenges. CSR in small and medium sized enterprises (SMEs) and in particular in young SMEs has been much less visible and to date is largely understudied. Still SMEs collectively make up over 60% of employment and account for over 2/3rds of all pollution (EC 2016; Parker et al. 2009). Moreover, if we push policy makers to promote a more Entrepreneurial Society in Europe, the share of young SMEs in the economy will rise. Consequently, it is urgent to investigate how this will affect the trend towards a more socially and ecologically responsible corporate sector. In this policy brief, we present arguments and some supporting evidence to show that the CSR performance of young SMEs is driven mainly by the personal attitudes and social

disposition of the founder-entrepreneur. An experiment in the field then showed us that entrepreneurs are in fact more co-operative and socially oriented than non-entrepreneurs. This implies that a transition to a more entrepreneurial economy will not weaken but possibly strengthen CSR achievements to date. To ensure it does, entrepreneurship policies should emphasize creativity and co-operative venturing more than business skills. This brief first briefly discusses the research we have done. Then we elaborate on the most pertinent results and policy implications and

reporting on CSR practices typically target large multinational corporations (MNCs) and SME implementation of CSR practices is much more informal and therefore largely invisible. The evidence we did find, strongly suggests that actions and attitudes of leading managers and employees are profoundly important in large and small firms alike. Moreover, comparative case studies (e.g. Baumann-Pauly et al. 2013) suggest CSR in SMEs is less visible but more profoundly incorporated in business practices. But very little is known about the social attitudes of entrepreneurs. We

Figure 1: Average contribution levels per round for entrepreneurs and non-entrepreneurs in high and low stakes game
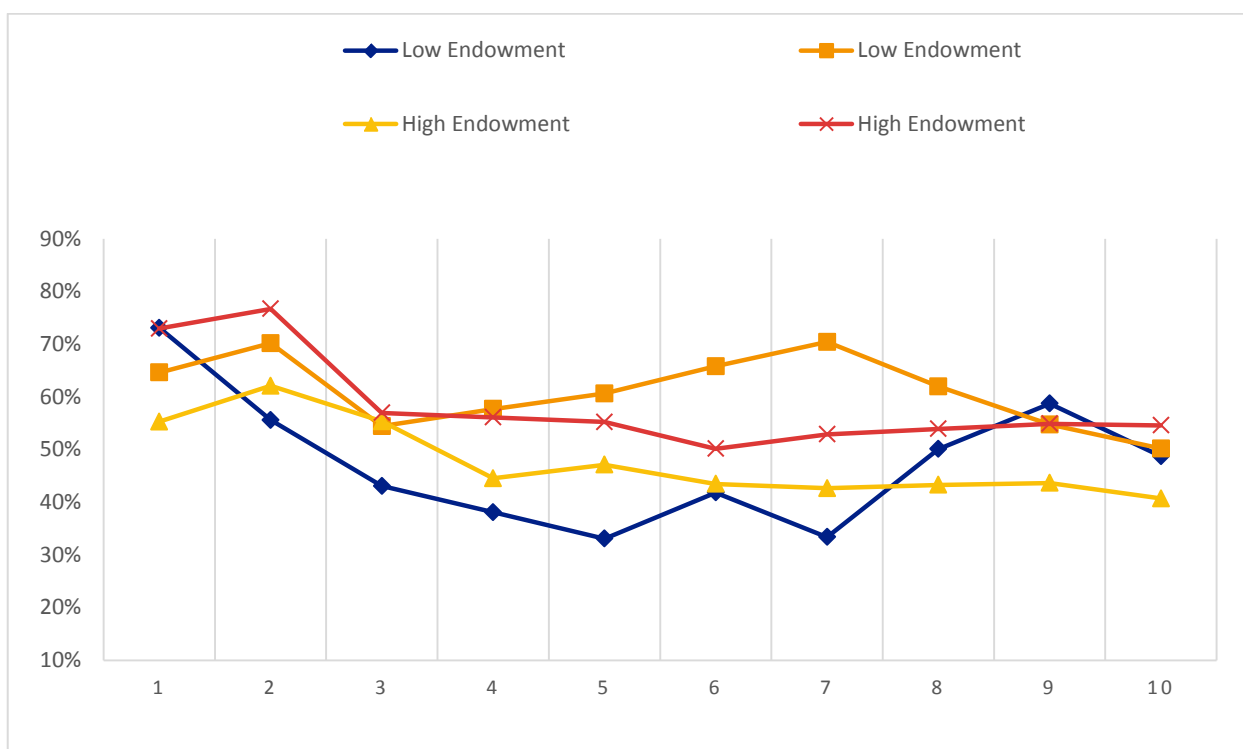
conclude.

The Entrepreneur Matters

We have first surveyed the available scientific evidence on CSR in SMEs. This evidence is rather scattered and produces mixed results. This is largely due to the lack of good data on SMEs in general and on their CSR performance specifically. The international initiatives to promote CSR and enhance transparency and

therefore decided to investigate these in a field experiment. This Sharing and Co-operative Attitudes Lab Experiment (SCALE) was designed and implemented in three different subject pools in Germany in 2015-2016.

The Entrepreneur is Social

The results of SCALE-experiment support the conclusion that entrepreneurs are more co-

operative than non-entrepreneurs and therefore unlikely to weaken the trend towards more CSR in business. The figure above for example shows that entrepreneurs on average contribute more of their endowment (in % on the vertical axis over 10 rounds of interaction on the horizontal axis) to a joint project than non-entrepreneurs. They are also shown to freeride less and co-operate more in their game behavior. To the extent that such pro-social attitudes are a good proxy for overall attitudes towards CSR, this is of course good news. Promoting entrepreneurship will then promote inclusive growth and CSR in SMEs. Of course, a lot of caveats must be made with these preliminary results. The SCALE-experiment should be reproduced with entrepreneurs from different cultural and institutional backgrounds to put a stronger empirical basis under our result. Moreover, we have compared our entrepreneurs to non-entrepreneurs active in the start-up scenes of Hamburg and Berlin. These are certainly not representative of other, potentially more relevant control groups, such as top-level managers in MNCs or regular employees. We did compare our entrepreneurs to business and economics students as a first approximation, and results are even stronger and in line with the emerging trend towards more social entrepreneurship (Lepoutre et al. 2013). But more research in the field is needed to establish the claim that entrepreneurs are more pro-social. This is also true for the hypothesis that co-operative behavior in a lab environment is a good proxy for attitudes towards and commitments to CSR in real business environment.

Implications and Recommendations

Our research supports three policy recommendations that we would like to emphasize.

1. DG-Research should support experimental research. Specifically, implementing the SCALE-experiment in multiple countries and subject pools would yield valuable information on the social attitudes of entrepreneurs across European contexts and ecosystems.
2. DG-Growth should investigate the link between social attitudes and actions (e.g. measured in SCALE) and CSR commitment and performance in real world businesses.
3. DG Growth and Member States should design their entrepreneurship policies and supporting institutional framework to promote CSR awareness and sensitivity among entrepreneurs.

These policies do not directly generate more CSR results or inclusive and innovative growth in Europe. Instead, they create the knowledge base required to align policy efforts in the usually distinct areas of entrepreneurship policy and CSR support. Moreover, they help build the long run preconditions for an innovative SME-sector that contributes more to addressing societal challenges.

References:

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