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THE SIGNALING PARADOX – A behavioral framing experiment on the effect of ‘publicness’ on strategic behavior in PPPs

(former working title: “THE IMPACT OF TRUST IN STRATEGIC PARTNERS ON PPP SURVIVAL: AN EXPERIMENTAL STUDY”)

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ABSTRACT

Public-private partnerships (PPPs) have become widespread in the delivery of public services. This paper explores cognitive and behavioral mechanisms of partnering across sectors at the micro-level of interaction between public and private partners. We argue that role framings of partners as public or private can have adverse signaling effects on individuals' intention to uphold effective partnerships over time, and that this intent is moderated by sector-specific attitudes. Using a novel and dynamic multi-stage behavioral experiment based on the classic centipede game ($N=482$, $Obs.=4,338$), we show that sector affiliation functions as a strong signal for partners' strategic behavior in PPPs and that sector-specific associations asymmetrically moderate respondents' will to collaborate. These findings contribute to micro-foundations of strategic behavior in PPPs, calling into question assumptions about coordination efficiency in cross-sectoral partnerships. We draw conclusions on the governance of risk in PPPs and derive an agenda for future research.

Keywords: PPP, signaling, strategic risk behavior, collaboration, behavioral public administration.

EVIDENCE FOR PRACTICE

- Partner's sector affiliation is a powerful cue for behavior because it elucidates associations that can have detrimental effects on collaboration efficacy by creating *anti-private sector bias*.
- Results show that despite positive signals, people are more likely to assume that private sector actors will defect and – hence – defect themselves in order to minimize losses to public welfare. This is paradoxical because it is precisely this strategy that eventually *causes* losses to public welfare by terminating the PPP.
- People are more likely to defect in later stages of the PPP life-span. Emotional involvement with the public sector is positive for PPP survival but people with high levels of PSM are more likely to terminate the PPP early.

INTRODUCTION

Public-private partnerships (PPPs) have become popular with policy makers worldwide (Klijn and Teisman 2003): Across sectoral boundaries, two or more often very dissimilar partners come together to co-create public goods and services, which are considered to be otherwise unattainable (Hodge and Greve 2007; 2017). However, a large body of research points out how the success of cross-sectoral collaboration is too often subject to problems of coordination (Klijn and Teisman 2003) and effective risk sharing among partners (Hodge 2004). These problems often result in dramatic losses for public agencies, while private partners may ride free (Klijn and Teisman 2003; Hodge 2004; Edelenbos and Klijn 2007; Hodge and Greve 2007; Bryson, Crosby, and Stone 2015).

From a behavioral perspective, PPPs are full of paradoxes: In order to create stable and long-lasting relationships partners in PPPs have to find ways to coordinate and bridge the very distinct logics and goals of the involved sectors. In the public realm, bureaucrats are expected to follow rules strictly and to take into account issues of societal welfare (Simon 1945), whereas private actors are assumed to maximize their individual utility. Therefore, making strategic choices in PPPs is tough: Managers are required to anticipate their partners' latent intentions and coordinate their own organization accordingly and in such a way that fosters overall partner collaboration instead of sending signals that may undermine a trustful partnership.

A number of recent studies show that individuals' attitudes toward the public sector are systematically biased by sector-specific and often stereotypical associations (see, for instance, James and Moseley 2014; Marvel 2015; Olsen 2015; Marvel 2016; del Pino et al. 2016). Although these associations need not necessarily be negative it is reasonable to assume that in PPPs, they will influence individual strategies as well as assumptions about the strategic behavior of the partners (Scharle 2002). Game theoretical research on collaboration efficiency

suggests that negative assumptions about partners' will or capacity to collaborate can have detrimental effects on strategic choice under risk and, ultimately, lead to partnership failure (Gulati, Wohlgezogen, & Zhelyazkov 2012; Bryson, Crosby, and Stone 2015). Since sector-specific stereotypes function as a strong signal for (in)efficiency, we assume that partners' sector affiliation and sector-specific associations will have a strong effect on the strategic choices they make and, hence, influence the likelihood of PPP survival.

To test and elaborate this idea, the current paper explores cognitive and behavioral mechanisms of cross-sectoral collaboration at the micro-level of interaction between public and private sector partners. We argue that the specific role in which people find themselves in (i.e. as a public or a private sector decision maker) and, consequently, whether they are collaborating with a private or a public sector partner substantially influences their intention to uphold effective partnerships, and that this relation is moderated by sector-specific associations. Specifically, the current study reports experimental evidence of a between subject randomized vignette experiment employing a multi-stage choice experiment based on the classic centipede game (Rosenthal 1981). Using a large sample of $N=482$ German citizens, we explore how the emotional valence of public and private sector associations influence individuals' will to collaborate in a realistic PPP setting and analyze $Obs.=4,338$ strategic choices within the context of a PPP under risk to show how deviances in strategic choice between cross-sectoral partners are related to their sector affiliation and moderated by sector-specific associations.

Although not central to this study, its innovative methodology comes with a number of crucial advantages. First, by opting for an experimental research design, we seek to identify causal mechanisms based on systematic and balanced treatment variation, heading calls by Jilke et al. (2016), van Witteloostuijn (2015), and Walker et al. (2017). Second, to our knowledge, we are the first to administer the centipede game (Rosenthal 1981) in the field of PA and PM research,

thus introducing a new tool for measuring strategic choice over time. Third, this study combines both direct and indirect measures of attitudes and risk propensity to answer calls for a more rigorous behavioral approach to PA research (Grimmelikhuijsen et al. 2017; Walker et al. 2017).

The remainder of this paper is organized as follows: The next section draws on previous research to develop theory and derive hypotheses exploring the sector-specific signaling effect on strategic decision making in PPPs. To make this contribution, the research framework combines well-established and complementary scholarship on strategic management in PA, social psychology and game theory. The third section introduces our take on a classic behavioral experiment developed to model the strategic dilemma at the core of risk governance in PPPs and describes the data raising procedure. The results of survival analysis and multi-level regression modelling are presented in section four. The final section discusses theoretical and practical implications of these findings as well as limitations paving way for future research.

THEORY

Heterogeneity of Partners: The Signaling Effect

One of the central questions for the study and practice of PA and PM is the relationship between the public and the private sector (Brewer and Brewer 2011). For decades, scholarship is busy exploring the institutional differences between the sectors (e.g. Bozeman and Bretschneider 1994; Rainey and Bozeman 2000) and whether employees' behavior is affected by the circumstance of working in civil services vis-à-vis in a business context (Brewer and Brewer 2011). This stream of research is essential for PPPs because, by definition, actors from dissimilar sectors collaborate in PPPs. Prior research provides evidence that cross-sectoral heterogeneity can cause a number of problems for PPP success because partners' heterogeneity regarding their institutional objectives often manifests in concurrent long-term interests which

eventually erode mutual trust, decrease partners' capacity to collaborate and, hence, diminish the chance of PPP survival (Klijn and Teisman 2003; Hodge and Greve 2007; Bryson, Crosby, and Stone 2015). For instance, cross-sectoral research on managerial choice by Nutt (1999; 2005) shows that individuals follow dissimilar strategies when making decisions in the public compared to the private sector. Consequently, it is not surprising that, by analyzing cases from the Netherlands, Klijn and Teisman (2003) find that partners find it especially difficult to make joint decisions and develop long-lasting, trustful, and effective relationships.

Apart from situational factors that might foster opportunism – for instance, badly crafted contractual partnership agreements – partners' perceived heterogeneity is one of the most serious obstacles for PPP long-term survival because it potentially results in behavioral deviances in strategic choice on the level of the individual: Public sector actors are socialized to pursue dissimilar organizational goals and follow dissimilar institutional logics than private sector actors. These logics define what is regarded as *adequate* behavior in a specific situation under risk and uncertainty and mold perception and decision making accordingly (Gigerenzer & Gaissmaier 2011; Rohde and Rohde 2011). The idea that organizations frame human decision making by providing specific contexts goes back to Herbert Simon's perennial work on *Administrative Behavior* in which he points out that the specific context of the public sector primes and frames the premises of decision making on the level of the individual (Simon 1945: XV-XXX). Simon stresses that human rationality is bounded and limited by its psychological environment, which constantly imposes a complex set of framing factors to direct choice behavior (Simon 1945: 108). Consequently, it is reasonable to assume that public and private sector actors will be triggered to follow dissimilar risk strategies in PPPs because although both partners act within the same constraining environment of the PPP, they both know that their partner is different and, accordingly, interpret this heterogeneity as a signal for their partner's collaboration efficacy: Private actors are expected to maximize profits while public actors must

find a satisficing balance between achieving their specific strategic goals within the PPP and the broader objectives of societal welfare (Simon 1945: 69). The same holds for each partner's interpretation of their own role and will influence their very own strategy.

Since public and private sector partners acting within the same context of a PPP but with dissimilar strategic goals, it follows that – *ceteris paribus* – sector affiliation influences individuals' strategic choice in the sense that public sector actors are more likely to pursue satisficing risk strategies that support the common goal of the PPP while private sector actors are more likely to follow risk strategies that maximize only their individual utility. Consequently, we hypothesize that

Hypothesis 1 (H1): Decision makers' sector affiliation influences the likelihood of PPP survival, such that public sector actors are less likely to defect from PPPs under risk than private sector actors.

The role of sector-specific attitudes

Beyond the general framing effect of the partners' sector affiliations arising from different institutional backgrounds and strategic goals, collaboration in PPP may be affected by the more implicit associations or stereotypes that partners hold towards the public and private sector. An emerging field of research in PA and PM has been preoccupied with the systematic biases and stereotypical associations in individuals' attitudes toward the public sector (e.g., James and Moseley 2014; Marvel 2015; Olsen 2015; Marvel 2016; del Pino et al. 2016). Because people associate very dissimilar concepts with the sphere of the public and the private sector, respectively, self-fulfilling prophecies could threaten the likelihood of PPP survival. While the exact direction of the association effect is hard to determine a-priori, it follows that the strength and valence of the signaling effect of partner's sector affiliation will be influenced by the initial associations that decision makers hold toward the sectors. The reason is that associations are

the foundations of attitudes and attitudes are helpful for the lazy brain: Attitudes form relatively stable patterns of learned behavior to regularly react toward objects of evaluation in a favorable or an unfavorable way (Schacter and Graf 1986; Chen and Bargh 1999; Conrey and Smith 2007). Since human cognition is bounded, attitudes function as important heuristic blue prints for behavior and, thus, facilitate decision-making because they decrease the cognitive load of choice (Collins and Loftus 1975; Gigerenzer and Gaissmaier 2011).

Based on research in neuro-economic and behavioral psychological research, many scholars argue that elaborate reasoning about the most rational economic behavior of partners is usually not sufficient to making good strategic decisions under risk (e.g. Overskeid 2000; Loewenstein et al. 2001; Brighton and Gigerenzer 2015) and that choice in situations of incomplete information relies heavily on these heuristic shortcuts or even pure *gut feeling* of liking or disliking (Overskeid 2000; Loewenstein et al. 2001). Both conditions hold true for PPPs – they are risky and information about partners’ latent objectives and strategies is incomplete. This suggests that it is likely that decision makers in PPPs will be influenced by their sector-specific associations when making assumptions about the strategies of their cross-sectoral partners and that this effect will differ substantially between the sectors because people associate very dissimilar things with the public and the private sector.

Based on the assumption of anticipatory strategic choice and the prevalence of sector-specific attitudes, we hypothesize that

(H2): The valence of sector-specific associations moderates the signaling effect of partners’ sector affiliation on the likelihood of PPP survival, such that it is stronger (weaker) if decision makers hold positive (negative) associations toward their partner’s sector.

DATA AND METHODS

We tested our hypotheses in a dynamic multi-stage behavioral experiment with randomized trials. The game is based on the classic centipede game (Rosenthal 1981) and complemented with a situational role framing treatment. This design combines advantages of two experimental procedures: First, by employing a close-to-life PPP scenario with sector-specific framing vignettes, it hopes to increase the ecologic validity of this research. Second, using the dynamics of an economic game allows manipulating situational risk and uncertainty in a controlled and systematic way.

Participants

The current study relies on experimental responses by $N=482$ German citizens who made a total of $Obs.=4,338$ strategic decisions. The data were collected online from October to November 2017 using a professional standing panel of graduate students of PM, business administration, and other social sciences at a large national university. Study participants were incentivized with the possibility of winning one of eleven significant money prizes (1x €250, 4x €150, 6x €50) to be paid out as gift vouchers for a well-known online retailer. Out of the total pool of 2,429 individuals, 646 took part in the online experiment, corresponding to a response rate of 26.6%. Although incomplete responses were excluded rigorously from the dataset, sampling still resulted in treatment groups of adequate sizes (public sector treatment: $n=263$; private sector treatment: $n=219$) to detect small to medium sized treatment effects (Cohen's $d < |0.30|$, power=0.8, $\alpha=0.05$) in two-tailed between group tests ($n=172$, Ellis 2010). Although not representative for the population, this sample is an especially interesting target group for PA research because the future decision makers of both civil services and private sector organizations are likely to be recruited from this particular group of students.

Contextual framing treatment

Participants were introduced to the fictitious scenario of a well-established large-scale urban development PPP project (see supplementary material for full setup and vignette treatments). Respondents were asked to consider that this project was conducted collaboratively by the local government of their hometown (i.e. the public partner) and by a for-profit construction firm (i.e. the private partner). Both the partnership and the project were described in a positive way in the sense that most stakeholders regarded the aims of the PPP as mutually beneficial to everyone involved. This information was given to make clear to all participants that collaboration until project completion was the most beneficial option for all partners involved and that this was not a zero-sum game. In each round, the instructions explicitly showed that participants' individual expected value in case of defection was substantially smaller than their expected value in case of their collaboration.

Next, respondents randomly received one of two vignette priming treatments. Participants were asked to assume the role of a member working in either of the two PPP partner organizations, i.e. one treatment put them into the position of a senior civil servant, the other treatment put them into the role of a strategic manager at the private construction firm. In this way, we aim to achieve a sector-specific priming to elicit realistic context-dependent behavior (*HI*) within the scope of the controlled environment of the vignette experiment (Aguines and Bradley 2014).

After the situational role framing, participants were informed that the partnership had been successful and to mutual benefit in the past to prime a highly collaborative setting. However, the setting explained that the partnership had become negatively affected by unpredictable external factors so that it could potentially lead to disastrous financial losses if the project was not completed as planned. Furthermore, a contractual gap would now allow the partners to unilaterally terminate the partnership to the disadvantage of the remaining partner.

Centipede game

The above scenario was implemented as a pseudo two-player non-zero-sum centipede game set in the domain of gains (Rosenthal 1981; Kawagoe and Takizawa 2012). The centipede game is a finite game with a predefined number of rounds (100 in Rosenthal's (1981) original setup, hence the name) with linear increasing pay-outs and stable rules known to both players beforehand (McKelvey and Palfrey 1992). In this game, two players make consecutive strategic decisions to cooperate in the prospect of a larger reward several rounds later or they can decide to defect and cash-in an immediate and smaller reward. If the first mover (player A) decides to defect and thus ends the collaboration, the second mover (player B) will have substantial disadvantages from A's decision. The centipede game thus models a conflict of short-term self-interest against long-term considerations of mutual benefit. Since the pot that is shifted between the two players grows with each round, it is beneficial for players to continue the game if they feel that they can trust their partner to also continue so that, in the end, they will both profit from the full pot.

The game consisted of a maximum of 10 rounds. The scenario was designed to suggest that the threat of the PPP collapse through the early withdrawal of government funding was reduced through continuous collaboration. However, players always had the possibility to terminate the partnership early to the severe disadvantage of their partner: If players decided to defect, they had first movers' advantage and could still materialize funding of a smaller amount while their partner would get nothing. The exact progression of pay-outs was based on Madden et al.'s (2009) probability discounting questionnaire because its tasks provide a validated scheme for systematically varied expected utility under risk. Figure 1 displays the centipede game structure with individual pay-outs for each partner in case of collaboration and defection.

[Figure 1 here]

The online-experiment was played with only one respondent at a time but the vignette-scenario was framed as a two-player situation stressing that the opposing party also had the power to terminate the PPP without further notice. To increase realism, participants were reminded of this uncertainty about the other partner's actions. However, the experiment was so programmed as to always signal that the opposing partner wished to continue the collaboration. Respondents were debriefed at the end of the survey.

Dependent variable

PPP survival. In each round of the centipede game, respondents had to indicate whether they wanted to collaborate and proceed to the next period or terminate the collaboration. We used the exit node in relation to the maximum of 10 rounds as our main dependent variable, i.e. the likelihood of PPP survival.

Independent variables

Sector-specific associations. We asked respondents to think carefully about the role they were asked to assume and to indicate at least three explicit associations they spontaneously attributed to the sector they were ascribed to (i.e. the public sector if they were to act as a senior civil servant or the private sector if they were asked to assume the role of strategic manager at the construction firm, respectively). We matched these explicit associations with Vö et al.'s (2009) *Berlin Affective Word List (BAWL-R)*, a systematic inventory of the emotional arousal of several thousand German words, to evaluate these sector-specific associations by their emotional valence and, thus, detect whether our respondents held relatively negative or positive implicit attitudes toward the sectors. Consequently, the compound valence scores (rank-

matched geometric means) resulted in two revealed independent variables, which we use to test *H2*.

Public and private sector attitude. Furthermore, we measured respondents' explicit attitudes toward the two sectors: As part of the socio-demographic questionnaire, respondents were asked to indicate their explicit attitudes toward the public and the private sector on two single seven-point Likert-type items ranging from 1='very negative' to 7='very positive'. The order of these two items was randomized to inhibit order effects and their exact wording is presented in the online appendix to this study.

Control variables

Risk propensity. Prior research by Barsky et al. (1997) and Hartog et al. (2002) suggests that individuals' will to collaborate is influenced by individual risk preferences. This argument is straightforward since a considerable body of research – see, for instance, Sitkin and Weingart (1995), Dohmen (2011), or Rohde and Rohde (2011) – shows that risk attitudes prime and mediate strategic behavior under risk. Respondents' risk preference was revealed with Madden et al.'s (2009) probability discounting questionnaire.

Tolerance for uncertainty. Individual's tolerance for uncertainty was measured with Dalbert's (1999) scale on general and work-related tolerance for uncertainty. The scale comprises eight six-point Likert-type items with opposite labels ranging from 1='strongly disagree' to 6='strongly agree'. Higher sum-scores indicate higher tolerance for uncertainty.

Trust in others. Participants' general trust in others was measured with Yamagishi and Yamagishi's (1994) six-item Likert-type *General Trust Scale* with opposite value labels ranging from 1='strongly disagree' to 5='strongly agree'.

Public service motivation. People differ in their motivation to help others and to make meaningful contributions to common welfare, and this motivation may have influence on their decision-making behavior in PPPs. We therefore control for public service motivation (PSM) using Kim et al.'s (2012) 12-item Likert-type scale (with opposite value labels ranging from 1='absolutely disagree' to 7='absolutely agree').

Numeracy. Since people are dissimilarly familiar with evaluating numerical performance information, we test and control for respondents' numerical literacy with the first seven items of Weller et al.'s (2013) *Abbreviated Numeracy Scale*. This scale originally comprises eight items of statistical word problems of varying complexity. The last and most complex item was dropped for the sake of research pragmatism and to inhibit higher dropout rates.

Demographics. Finally, we controlled for respondents' gender and age.

Analytic procedure and model estimation

Hypotheses were tested in two consecutive steps. After preliminary descriptive analysis, we first focus on the treatment effect of sector affiliation on *PPP survival (H1)* by conducting survival-based mixed effects logistic regression analyses. Second, we decipher the association-based dynamics of the treatment effect on *PPP survival*, subsequently adding interaction terms to test for moderation effects (*H2*) in a second model. All models are clustered at the individual level to take into account the conditional contribution of each respondent, which is a consequence of the varying number of game periods played by each person.

RESULTS

Descriptive results

The dataset comprises responses by $N=482$ participants, 90% of which were German citizens. On average, respondents took 14.6 minutes to complete the full experiment. The descriptive statistics of the sample and the covariates with correlations and reliabilities are presented in Table 1. The sample comprises more female participants (61.2%) and respondents are on average $M=24.7$ ($SD=4.94$) years old. The probability discounting task reveals that the sample is predominantly risk averse ($\ln(h)$: $M=0.96$, $SD=0.80$; risk neutrality at $M=0.00$) and that they slightly prefer to avoid uncertainty ($M=2.54$, $SD=0.66$; six-point scale)).

[Table 1 here]

Respondents report average levels of PSM ($M=3.48$, $SD=0.70$) and trust in others ($M=2.54$, $SD=0.66$). They express rather negative attitudes towards both sectors when asked explicitly (public: $M=2.83$, $SD=1.44$; private: $M=2.76$, $SD=1.47$; $t(482)=0.770$, $p=0.442$).

Regarding their stated associations, respondents differentiate between the public ($M=0.31$, $SD=1.30$) and the private sector ($M=0.51$, $SD=1.39$) and – even though we find a significant amount of mean variation – ascribe more negative affective valence to the public sector (mean emotional valence range: $min.=-3.0$, $max.=3.0$; $t(1,444)=2.801$, $p=0.005$).

Participants are above average capable in handling numerical information ($M=4.70$, $SD=1.40$), which indicates that responses to the experiment are reliable and not biased by a lack of numeracy.

Hypotheses testing

At first glance, descriptive analysis shows relatively little variance between the two treatment conditions if we focus only on the overall survival of the PPP. after the maximal PPP life span of 10 periods. On average, respondents decided to uphold the PPP for $M=8.51$ ($SD=3.08$) periods in the public treatment and $M=8.73$ ($SD=2.67$) periods in the private treatment ($t(4,336)=0.010$, $p=0.010$; $d=-.078$). Although the differences between treatment groups are seemingly small, there is significant variance between the two treatment groups in the course of the individual periods as revealed by the mixed-effects logistic regression models (Table 2).

The main effects model is well-specified (Wald Chi^2 (10)=84.49, $p<0.000$) and indicates a substantial negative effect of being framed in a public sector context, i.e. being teamed with a private sector partner (treatment effect: $\beta_1=-0.26$, $p=0.049$) on the likelihood of *PPP survival*. This suggests that *H1* has to be rejected because having a private sector partner significantly reduces respondents' will to maintain the PPP until successful project completion. We find that *PPP survival* is directly and substantially influenced by respondents' explicit attitudes about the public ($\beta_3=0.239$, $p<0.000$) but not about the private sector ($\beta_4=-0.078$, $p=0.227$). As expected, individual characteristics such as respondents' risk preference ($\beta_5=-0.069$, $p<0.000$), their explicit trust in others ($\beta_6=0.311$, $p=0.006$), and their individual tendency to avoid uncertainty ($\beta_7=-0.139$, $p=0.084$) also explain substantial amounts of variance, while the model does not reveal age ($\beta_8=-0.013$, $p=0.390$) or gender effects ($\beta_9=-0.192$, $p=0.131$) as predictors of *PPP survival*.

[Table 2 here]

The reason for the small size of the signaling effect is revealed by inspecting the smoothed hazard function (Figure 2, estimated with Nelson-Aalen method). The graph shows the total percentage of dropouts by treatment in each game period. In the first two periods, public sector actors exhibit lower dropout rates than private sector actors while showing substantially higher dropout rates in the four last periods. This indicates that, while public sector actors are less likely to defect in the beginning, their behavioral strategy is a higher threat PPP survival than private sector actors': After incentives to defect grow and transgress a certain threshold in period six, public sector actors become significantly more likely to defect until the signaling effect decreases for the last period.

[Figure 2 here]

We hypothesized that the relationship between sector affiliation and the likelihood of *PPP survival* was moderated by respondents' sector-specific associations because these associations would determine the direction of the signaling effect of having a partner from the public or the private sector (*H2*). We analyze the dynamics of this association-based moderation effect by estimating a second mixed-effects logistic regression model (Model *II* in Table 2) to analyze the interaction terms between sector-specific treatment and the two compound valence scores derived from respondents' associations with the two sectors. The model is also well specified

(Wald Chi^2 (13)=138.83, $p<0.000$) and posthoc analysis shows that multicollinearity was not an issue. In Model *I*, sector-specific associations have only a marginal positive but statistically insignificant effect on the likelihood of *PPP survival* ($\beta_2=0.08$, $p=0.141$) while explicitly stated attitudes toward the public sector were positive linear predictors for *PPP survival* ($\beta_3=0.24$, $p<0.000$) and explicit attitudes toward the private sector had no predictive reliability ($\beta_4=-0.08$, $p=0.227$). In contrast, Model *II* shows that revealed sector-specific associations strongly and statistically reliably predict *PPP survival* ($\beta_3=-1.63$, $p<0.000$). The relation is negative which means that either way, pronounced public or private sector attitudes have a detrimental effect on the likelihood of respondents' will to uphold beneficial long-term collaboration with cross-sectoral partners. This finding is strongly supported by the finding that under both treatment conditions interaction effects with revealed public and private sector associations are robust and positive (public: $\beta_5=1.51$, $p<0.000$; private: $\beta_6=1.81$, $p<0.000$).

[Figure 3 here]

Inspecting the marginal effect plots of sector specific associations on *PPP survival* within their respective 95%-confidence intervals by treatment (Figure 3) further reveals how both positive and negative associations with the public sector result in a quadratic moderation effect on the marginal likelihood of *PPP survival*. In contrast, sector-specific associations with the private sector do not exert a similar complex moderation effect but, with a positive slope, have a linear marginal effect on the likelihood of *PPP survival*. Since we find that the valence of sector-specific associations moderates the strength of the signaling effect of partners' sector affiliation on *PPP survival*, H2 cannot be refuted.

DISCUSSION AND CONCLUSION

The findings from the experiment provide striking evidence for a signaling paradox: Public sector actors are more likely to terminate the PPP and follow risk strategies that are a higher threat to PPP survival than private sector actors even if their partner only sends positive signals for collaboration. For public sector actors, the information cue of knowing that they collaborate across sectors with a private sector actor is enough to cause actors to terminate the PPP early to the severe disadvantage of their partners' shared profit on the one hand but also to the detrimental loss of the general public's because the PPP project – which was regarded as beneficial by all stakeholders involved – is not finalized. In this way, public actors' assumption about the heterogeneous characteristics and potential hidden intentions of their private sector partners is enough to severely compromise public actors' fundamental role as outcome-oriented providers of public services. This result is in line with the predictions of prior qualitative scholarship by Scharle (2002), Klijn and Teisman (2003), Kets and Sandroni (2014), and Bryson, Crosby, and Stone (2015) and substantiates these lines of reasoning with quantitative results. The result is striking because it shows that, in the context of PPPs, private sector affiliation functions as a signal strong enough to elucidate negative assumptions about partners' intentions to collaborate – even in the face of explicit information indicating that there is no logical reason for partners to defect. Consequently, this finding resonates with prior empirical research by Calanni et al. (2014) and with conceptual ideas about the adverse effect of heterogeneity on collaboration efficiency by Kets and Sandroni (2014). Furthermore, our findings are in line with prior PA and PM research arguing that the origins of organizations' ability to coordinate and collaborate effectively across sectoral boundaries lay on the micro-level i.e. within the *individual* members of an organization and that PPP survival is thus

dependent on individual idiosyncrasies (Zand 1972; Lewis and Weigert 1985; Klijn and Teisman 2003; Calanni et al. 2014; Bryson, Crosby, and Stone 2015).

Because this effect cannot be explained by rational deduction based on the information provided in the experiment and because the effect is not mirrored by private sector actors in a reciprocal way (which would point toward a pure homophily effect), we find that the private sector signaling effect echoes another behavioral phenomenon of unconditional negativity previously observed in citizen-state interactions and dubbed *anti-public sector bias* (e.g. James and Moseley 2014; Marvel 2015; Olsen 2015; Marvel 2016; del Pino et al. 2016). However, what we find is, in fact, strong indications for an *anti-private sector bias*. Our results show that despite neutral signals, people are more likely to assume that private sector actors will defect and – hence – defect themselves in order to minimize losses to public welfare. This escalation of strategic choice is intriguing and tragic because it is only this biased *anti-private sector* assumption that eventually *causes* losses to public welfare by terminating the PPP – a paradox resonating loudly with the classic prisoner’s dilemma. Yet, this anti-private effect is not a bias in the sense of a cognitive illusion as defined by, for instance, Camerer (1998) or Rabin (1998), but represents exactly what Herbert Simon defined as a rational heuristic within the boundaries of a specific context (Simon 1945; Gigerenzer & Gaissmaier 2011). It is not irrational for public actors to assume that private sector partners may act more selfish because the former are not obliged to serve the public interest. Consequently, the *bias* in the *anti-private sector bias* is not a cognitive illusion but it is a *consequential bias* in strategic choice based on an erroneous interpretation of actors’ anticipation that private partners will defect even against their own best interest. Our findings are, therefore, fully in line with Simon’s (1945) model of bounded yet rational behavior within the specific context of the public sector and illustrate quantitatively how strategic choice in PPPs is bounded by context-dependent heuristics.

This result is intriguing in several ways because it stands in contrast to both normative choice theory and base-level assumptions about collaborative behavior of people with high levels of PSM.

First, normative choice theory predicts that rational actors should defect at the first possible node to minimize behavioral uncertainty and cash in any amount larger than zero. This is the optimal strategy in the assumption of backward induction (Aumann 1998) and it would also be in line with prior findings on the antecedents of free-riding (Albanese and van Fleet 1985). In contrast, we find that hardly any participant defects at the first node which indicates that respondents adopt mixed strategies that do not reflect classic assumptions about human choice. Prior empirical research using the centipede game shows that this behavior can be attributed to the expectation of a small chance that the other partner will be an altruist (McKelvey and Palfrey 1992).

The second prediction from game theory is that rational actors' likelihood to defect would grow linearly with each round since the incentive to terminate the partnership grows with each round while the expected utility from upholding the partnership at the end node is constant so that the marginal utility decreases with each round (Aumann 1998). In contrast, we find that the smoothed hazard function has a flattened negative parabolic slope (see Figure 3) with peak hazard in round seven. The form of this slope can be interpreted as an indicator of how actors' trust in their partner erodes as incentives to defect grow up to a certain threshold which is typical behavior in strategic alliances with potentially conflicting interests to defect (Kawagoe and Takizawa 2012; Krockow et al. 2015). Also, it is logical to find that the relative defection hazard decreases in the final rounds of the PPP because for the remaining actors a learning effect regarding their partners' intention might have set in.

Third, we find that sector-specific attitudes and associations are crucial drivers of strategic behavior in PPPs. While we find that private-sector associations have a linear positive effect on the likelihood of PPP survival, which means that higher emotional involvement increases decision makers' willingness to uphold cross-sectoral collaborations over a long period of time, the effect of public-sector associations is parabolic. This means that holding either very negative or very positive associations toward the public sector is beneficial to the likelihood that people will opt to uphold the PPP until completion which indicates that in fact emotional involvement with the public sector is positive for *PPP survival* irrespective of the direction of valence. Furthermore, this finding indicates that people who are passionless about the public sector are actually less likely to collaborate until PPP completion. The latter finding is in line with prior experimental research from economic psychology by Arora et al. (2012) who show that lower levels of emotional involvement lead to lower levels of trust in partners and, consequently, decrease collaboration efficiency in social good games. Trust is an essential micro-foundation of collaboration (Ostrom 1998). Consequently, public sector practitioners may want to entrust positions that involve the strategic management of critical situations in cross-sectoral partnerships with employees who are highly involved and passionate toward the cause of the PPP. Special care should be given to the establishment of a transparent and truly trustful relationship between all partners involved.

Third, results show that people reporting high levels of PSM are especially likely to terminate the PPP early. This is surprising because high PSM is usually regarded as a robust indicator for a higher likelihood of pro-social behavior and that people are especially likely to self-select into the public sector because this is the place to live their motivation to help others and contribute to the greater good (Crewson 1997; Vandenabeele and Skelcher 2015; Esteve et al. 2016). In contrast, we find that PSM decreases the likelihood of PPP survival. It is important to note that the effect of PSM was more than five times the size of being a risk averse person while the

negative effect of PSM was about equal to the positive effect of being a generally trustful person. One reason for the strong negative effect of PSM on PPP survival could be that prior research on PSM shows that high-PSM people hold a relative preference in favor of the public sector in general and may, thus, disregard of the whole idea of the project presented in the PPP scenario of the current experiment (Crewson 1997). On the other hand, the adverse effect of PSM is still puzzling because defecting from the PPP – and, thus, causing its death – is clearly adverse to societal welfare at least as described in the scenario of the current experiment. In this sense, this finding is in contrast to prior research by, for instance, Bullock, Rainey, and Stritch (2015) and may provide further evidence for a dark side to the concept of PSM (Schott and Ritz 2017).

Limitations and future research

Given that the empirical evidence of the current study is based on decisions made by graduate university students, we encourage future studies to assess the external validity of our findings by replicating our experiment – ideally with public and private sector executives. Even considering this limitation, the findings have important practical implications for the governance of risk in PPPs. Practitioners may want to conclude from our findings that it is wise to establish a shared culture of communality within the PPP to inhibit the adverse effects of perceived cross-sectoral differences.

Future research could also replicate our experimental design for within-sector collaborations in both the private and public sector and compare the results with findings for cross-sectoral collaborations in PPPs. This would provide an even more nuanced picture of framing and signaling effects since in PPP settings, almost by definition, the role framing of one partner (as public or private) implies a simultaneous framing of the other partner (as the opposite). This limited our possibilities to causally attribute the observed effects to the framing either of the self or the other.

Our study was further limited to the domain of gains, while future studies may want to replicate this study in the domain of loss. Prospect theory suggests that individuals follow dissimilar strategies when making decisions in the domain of gains as compared with the domain of losses (Kahneman and Tversky 1979; Thaler 1981): In the prospect of gains, i.e. when negotiating the distribution of potential future earnings from a cross-sectoral partnership, we should expect individuals to act relatively more risk-averse than in a situation in which partners would have to argue about sharing losses. More research in the loss domain would add to recent experimental research on risk preferences in the context of PPPs (Baekgaard 2017) and public funding (Bracha and Brown 2007; Khadjavi and Lange 2015).

Consequently, we strongly encourage future research to scrutinize how the special incentive structures in PPPs affect strategic behavior. We assume that our knowledge about the micro-mechanisms of behavior in PPPs will gain substantially by the use of more elaborate economic methods in PA and PM scholarship.

REFERENCES

- Aguines, H. & Bradley, K. J. (2014), 'Best practice recommendations for designing and implementing experimental vignette methodology studies', *Organizational research methods* **17**(4), 351–371.
- Albanese, R. & van Fleet, D. D. (1985), 'Rational behavior in groups: The free-riding tendency', *The Academy of Management Review* **10**(2), 244–255.
- Arora, P., Peterson, N. D., Krantz, D. H., Hardisty, D. J. & Reddy, K. S. (2012), 'To cooperate or not to cooperate: Using new methodologies and frameworks to understand how affiliation influences cooperation in the present and future', *Journal of Economic Psychology* **33**(4), 842–853.
- Aumann, R. J. (1998), 'On the centipede game', *Games and Economic Behavior* **23**(1), 97–105.
- Baekgaard, M. & Serritzlew, S. (2016), 'Interpreting performance information: Motivated reasoning or unbiased comprehension', *Public Administration Review* **76**(1), 73–82.
- Baekgaard, M. (2017), 'Prospect theory and public service outcomes: Examining risk preferences in relation to public sector reforms', *Public Administration* **95**, 927–947.
- Barsky, R. B., Juster, F. T., Kimball, M. S. & Shapiro, M. D. (1997), 'Preference parameters and behavioral heterogeneity: an experimental approach in the health and retirement study', *Quarterly Journal of Economics* **112**, 537–579.
- Bozeman, B. & Bretschneider, S. (1994), 'The publicness puzzle in organization theory: A test of alternative explanations of differences between public and private organizations', *Journal of Public Administration Research and Theory* **4**, 197–223.
- Brewer, G. A. & Brewer, G. A. J. (2011), 'Parsing public/private differences in work motivation and performance: An experimental study', *Journal of Public Administration Research and Theory* **21**, 347–362.
- Bryson, J. M., Crosby, B. C., & Stone, M. M. (2015) 'Designing and Implementing Cross-Sector Collaborations: Needed and Challenging', *Public Administration Review* **75**(5), 647–663.
- Brighton, H. & Gigerenzer, G. (2015), 'The bias bias', *Journal of Business Research* **68**, 1772–1784.
- Bullock, J. B., Stritch, J. M. & Rainey, H. G. (2015), 'International comparison of public and private employees' work motives, attitudes, and perceived rewards', *Public Administration Review* **75**(3), 479–489.
- Calanni, J. C., Siddiki, S. N., Weible, C. M. & Leach, W. D. (2014), 'Explaining coordination in collaborative partnerships and clarifying the scope of the belief homophily hypothesis', *Journal of Public Administration Research and Theory* **25**(3), 901–927.

- Camerer, C. F. (1998), 'Bounded rationality in individual decision making', *Experimental Economics*.
- Chen, M. & Bargh, J. A. (1999), 'Consequences of automatic evaluation: Immediate behavioral predispositions to approach or avoid the stimulus', *Personality and Social Psychology Bulletin* **25**(2), 215–224.
- Collins, A. M. & Loftus, E. F. (1975), 'A spreading-activation theory of semantic processing', *Psychological Review* **82**(6), 407–428.
- Conrey, F. R. & Smith, E. R. (2007), 'Attitude representation: Attitudes as patterns in a distributed, connectionist representational system', *Social Cognition* **25**(5), 718–735.
- Crewson, P. E. (1997), 'Public-service motivation: Building empirical evidence of incidence and effect', *Journal of Public Administration Research and Theory* **7**(4), 499–518.
- Dalbert, C. (1999), *Die Ungewissheitstoleranzskala: Skaleneigenschaften und Validierungsbefunde*, Halle: Martin-Luther-Universität Halle-Wittenberg, FB Erziehungswissenschaften – Pädagogik.
- del Pino, E., Calzada, I. & Días-Pulido, J. M. (2016), 'Conceptualizing and explaining bureauphobia: Contours, scope, and determinants', *Public Administration Review* **76**(5), 726–736.
- Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J. & Wagner, G. G. (2011), 'Individual risk attitudes: Measurement, determinants, and behavioral consequences', *Journal of the European Economic Association* **9**(3), 522–550.
- Edelenbos, J. & Klijn, E.-H. (2007), 'Trust in complex decision-making networks. A theoretical and empirical exploration', *Administration & Society* **39**(1), 25–50.
- Esteve, M., Urbig, D., van Witteloostuijn, A. & Boyne, G. (2016), 'Prosocial behavior and public service motivation', *Public Administration Review* **76**(1), 177–187.
- Gigerenzer, G. & Gaissmaier, W. (2011), 'Heuristic Decision Making' *The Annual Review of Psychology* **62**(1), 451–482.
- Grimmelikhuijsen, S., Jilke, S., Olsen, A. L. & Tummers, L. (2017), 'Behavioral public administration: Combining insights from public administration and psychology', *Public Administration Review* **77**(1), 45–56.
- Gulati, R.; Wohlgezogen, F., & Zhelyazkov, P. (2012), 'The Two Facets of Collaboration: Cooperation and Coordination in Strategic Alliances', *The Academy of Management Annals* **6**(1), 531–583.
- Hartog, J., Ferrer-i Carbonell, A. & Jonker, N. (2002), 'Linking measured risk aversion to individual characteristics', *Kylos International Review for Social Sciences* **55**(1), 3–26.
- Hodge, G. A. (2004), 'The risky business of public-private partnerships', *Australian Journal of Public Administration* **63**(4), 37–49.
- Hodge, G. A. & Greve, C. (2007), 'Public-private partnerships: an international performance review', *Public Administration Review* **67**(3), 545–558.

- Hodge, G. A. & Greve, C. (2017), 'On public-private partnership performance: A contemporary review', *Public Works Management & Policy* **22**(1), 55–78.
- James, O. & Moseley, A. (2014), 'Does performance information about public services affect citizens' perceptions, satisfaction, and voice behaviour? Field experiments with absolute and relative performance information', *Public Administration* **92**(2), 493–511.
- Jilke, S., Van de Walle, S. & Kim, S. (2016), 'Generating usable knowledge through an experimental approach to public administration', *Public Administration Review* **76**(1), 69–72.
- Kawagoe, T. & Takizawa, H. (2012), 'Level-k analysis of experimental centipede games', *Journal Of Economic Behavior & Organization* **82**(2), 548–566.
- Kets, W. & Sandroni, A. (2014), 'A belief-based theory of homophily'. <https://www.aeaweb.org/conference/2015/retrieve.php?pdfid=1180>
- Kim, S., Vandenabeele, W., Wright, B. E., Andersen, L. B., Cerase, F. P., Christensen, R. K., Desmarais, C., Koumenta, M., Leisink, P., Liu, B., Palidauskaite, J., Pedersen, L. H., Perry, J. L., Ritz, A., Taylor, J. & Vivo, P. D. (2012), 'Investigating the structure and meaning of public service motivation across populations: Developing an international instrument and addressing issues of measurement invariance', *Journal of Public Administration Research and Theory* **23**(1), 79–102.
- Klijin, E.-H. & Teisman, G. R. (2003), 'Institutional and strategic barriers to public-private partnership: An analysis of dutch cases', *Public money and Management* pp. 137–146.
- Krockow, E. M., Pulford, B. D. & Colman, A. M. (2015), 'Competitive centipede games: Zero-end payoffs and payoff inequality deter reciprocal cooperation', *Games* **6**, 262–272.
- Loewenstein, G. F., Weber, E. U., Hsee, C. K. & Welch, N. (2001), 'Risk as feelings.', *Psychological Bulletin* **127**(2), 267–286.
- Madden, G. J., Petry, N. M. & Johnson, P. S. (2009), 'Pathological gamblers discount probabilistic rewards less steeply than matched controls', *Experimental and Clinical Psychopharmacology* **17**(5), 283–290.
- Marvel, J. D. (2015), 'Public opinion and public sector performance: Are individuals beliefs about performance evidence-based or the product of anti-public sector bias?', *International Public Management Journal* **18**(2), 209–227.
- Marvel, J. D. (2016), 'Unconscious bias in citizens evaluations of public sector performance', *Journal of Public Administration Research and Theory* **26**(1), 143–158.
- McKelvey, R. D. & Palfrey, T. R. (1992), 'An experimental study of the centipede game', *Econometrica* **60**(4), 803.
- Nutt, P. C. (1999), 'Public-private differences and the assessment of alternatives for decision making', *Journal of Public Administration Research and Theory* **9**, 305–349.
- Nutt, P. C. (2005), 'Comparing public and private sector decision-making practice', *Journal of Public Administration Research and Theory* **16**, 289–318.
- Olsen, A. L. (2015), 'Citizen (dis)satisfaction: An experimental equivalence framing study', *Public Administration Review* **75**(3), 469–478.

- Ostrom, E. (1998), 'A behavioral approach to the rational choice theory of collective action: Presidential address, american political science association, 1997', *The American Political Science Review* **92**(1), 1–22.
- Overskeid, G. (2000), 'The slave of the passions: Experiencing problems and selecting solutions.', *Review of General Psychology* **4**(3), 284–309.
- Rabin, M. (1998), 'Psychology and economics', *Journal of Economic Literature* **57**(6), 11–46.
- Rainey, H. G. & Bozeman, B. (2000), 'Comparing public and private organizations: Empirical research and the power of the a priori', *Journal of Public Administration Research and Theory* **10**(2), 447–469.
- Rohde, I. M. T. & Rohde, K. I. M. (2011), 'Risk attitudes in a social context', *Journal on Risk and Uncertainty* **43**, 205–225.
- Rosenthal, R. W. (1981), 'Games of perfect information, predatory pricing and the chain-store paradox', *Journal of Economic Theory* **25**(1), 92–100.
- Schacter, D. L. & Graf, P. (1986), 'Effects of elaborative processing on implicit and explicit memory for new associations', *Journal of Experimental Psychology: Learning, Memory, and Cognition* **12**(3), 432–444.
- Scharle, P. (2002), 'Public-private partnership (PPP) as a social game', *Innovation: The European Journal of Social Science Research* **15**(3), 227–252.
- Schott, C. & Ritz, A. (2017), 'The dark sides of public service motivation: A multi-level theoretical framework', *Perspectives on Public Management and Governance* **XX**(XX), 1–14.
- Simon, H. A. (1945), *Administrative Behavior. A study of decision-making processes in administrative organizations*, The Free Press, New York.
- Sitkin, S. B. & Weingart, L. R. (1995), 'Determinants of risky decision-making behavior: A test of the mediating role of risk perceptions and propensity', *Academy of Management Journal* **38** (6), 1573–1592.
- van Witteloostuijn, A. (2015), 'Toward experimental international business', *Cross Cultural Management: An International Journal* **22**(4), 530–544.
- van Witteloostuijn, A., Esteve, M. & Boyne, G. (2017), 'Public sector motivation ad fonts: Personality traits as antecedents of the motivation to serve the public interest', *Journal of Public Administration Research And Theory* **27**(1), 20–35.
- Vandenabeele, W. & Skelcher, C. (2015), 'Review: Public service motivation: practical problems, scientific evidence and the role of a research community', *Public Money & Management* **35**(5), 321–327.
- Vö, M. L. H., Conrad, M., Kuchinke, L., Urton, K., Hofmann, M. J., & Jacobs, A. M. (2009), 'The berlin affective word list reloaded (BAWL-R)', *Behavior Research Methods* **41**(2), 534–538.

Walker, R. M., James, O. & Brewer, G. A. (2017), 'Replication, experiments and knowledge in public management research', *Public Management Review* **19**(9), 1221–1234.

Weller, J. A., Dieckmann, N. F., Tusler, M., Mertz, C. K., Burns, W. J. & Peters, E. (2013), 'Development and testing of an abbreviated numeracy scale: A Rasch analysis approach', *Journal of Behavioral Decision Making* **26**(2), 198–212.

Yamagishi, T. & Yamagishi, M. (1994), 'Trust and commitment in the United States and Japan', *Motivation and Emotion* **18**, 129–166.

Zand, D. E. (1972), 'Trust and managerial problem solving', *Administrative Science Quarterly* **17**(2), 229–239.

Table 1: Correlations and reliabilities

	1	2	3	4	5	6	7	8	9	10	11	12
Study variables												
1. PPP survival	–											
2. Public sector affiliation ^a	-.04*	–										
3. Public sector associations	.05**	-.11***	–									
4. Public sector attitude (explicit) ^b	-.01	-.03*	.09***	–								
5. Private sector attitude (explicit) ^b	-.03	.02	.00	.04**	–							
Control variables												
6. Risk propensity (revealed)	-.02	.09***	-.01	.04**	.06	–						
7. Trust in others (explicit)	.06***	.03	.03*	-.01	.07***	.03	–					
8. Uncertainty avoidance (explicit)	-.06***	.02	.07***	.00	.06***	-.01	-.10***	–				
9. PSM (explicit)	-.02	.02	-.03*	.01	-.07***	.03*	-.02	.04**	–			
10. Female ^a	-.02	-.03	.02	.01	-.01	.03*	-.04*	-.07***	.08***	–		
11. Age ^a	.04**	.01	-.01	-.05**	.05**	.11***	.15***	-.04*	.06***	-.08***	–	
12. Numeracy	.08***	.01	.02	-.02	.01	-.03	-.05***	.01*	-.11***	-.19***	-.04	–
<i>M</i>	8.62	.55	.40	2.83	2.76	3.59	2.54	2.54	3.48	.61	24.7	4.70
<i>SD</i>	2.90	.50	.91	1.44	1.46	3.16	.66	.66	.70	.49	4.93	1.40
<i>range</i>	0–10	1 / 0	-1.83–2.60	1–7	1–7	.33–15.31	1–5	1.30–5.30	1.85–5.80	1 / 0	17–51	0–6

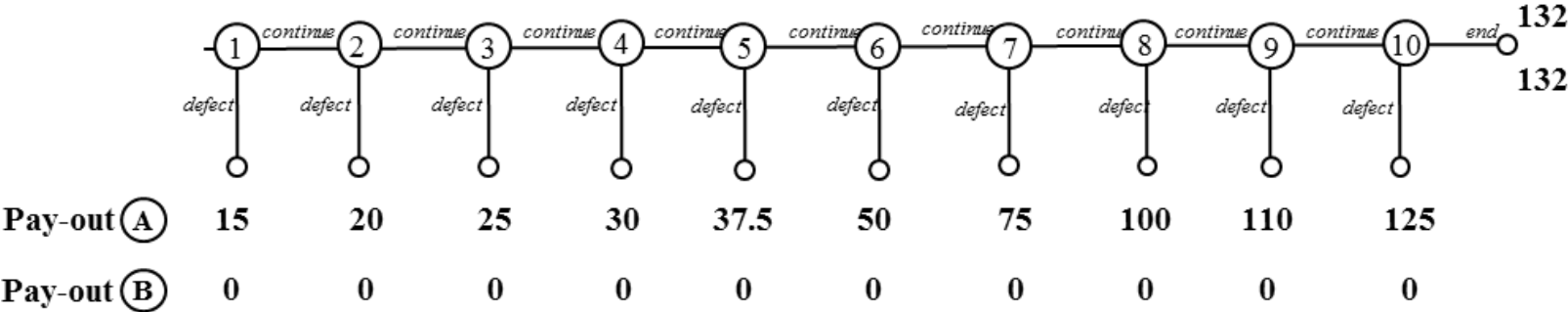
Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; ^a treatment distribution controlled for balance with between-group two-tailed *t*-tests, all n.s.; ^b stated attitudes centered for normalization.

Table 2: Mixed-effects logistic regression analysis on *PPP survival*

	<i>Model I</i>				<i>Model II</i>			
	b	SE	[95% CI]		b	SE	[95% CI]	
Treatment effect								
Public sector affiliation (i.e. <i>collaborating with a private sector partner</i>)	-.26*	.13	-.52	-.00	-.29*	.14	-.56	-.02
Subject-level effects								
Sector-specific associations	.08	.06	-.03	.19	-1.63***	.22	-2.06	-1.20
Public sector attitude	.24***	.07	.11	.37	.27***	.07	.14	.41
Private sector attitude	-.08	.07	-.21	.05	-.09	.07	-.22	.04
Two-way interactions								
Public sector treatment x public sector associations					1.51***	.21	1.11	1.92
Private sector treatment x private sector associations					1.81***	.25	1.31	2.30
Control variables								
Risk aversion (revealed)	-.07***	.02	-.10	-.03	-.06***	.02	.14	.41
Trust in others (explicit)	.31**	.11	.09	.53	.37**	.11	.15	.59
Uncertainty avoidance (explicit)	-.14†	.08	-.31	.03	-.10	.09	-.27	.07
PSM (explicit)	-.36***	.09	-.54	-.18	-.34**	.10	-.54	-.15
Age	-.01	.02	-.04	.02	-.01	.02	-.05	.02
Female	-.19	.13	-.44	.06	-.29*	.12	-.53	-.04
Intercept	4.38***	.59	3.23	5.54	4.33***	.63	3.11	5.56
<i>Obs.</i>	4,338				4,338			
<i>N</i>	482				482			
<i>Wald Chi² (df)</i>	84.49***				138.83***			
<i>df</i>	10				13			
<i>VIF</i>	1.03				2.54			
<i>AIC</i>	2,064				2,006			
<i>BIC</i>	2,134				2,089			
<i>-2*Log Likelihood</i>	2,042				1,980			

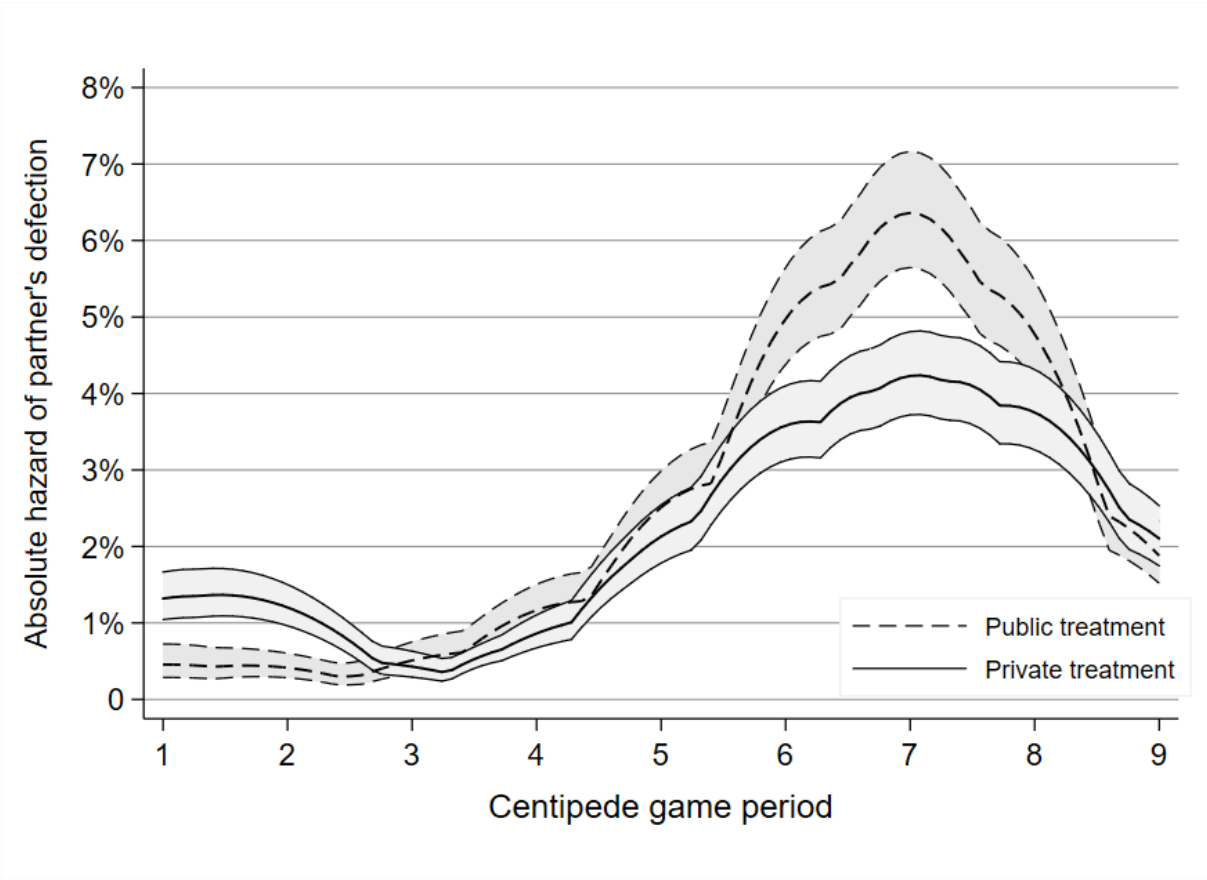
Notes: Clustered at individual level for conditional contribution, robust standard errors; explicit attitudes centered. Model I: main effects; Model II: combined model with interaction effects. † $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Figure 1: Extrinsic game structure



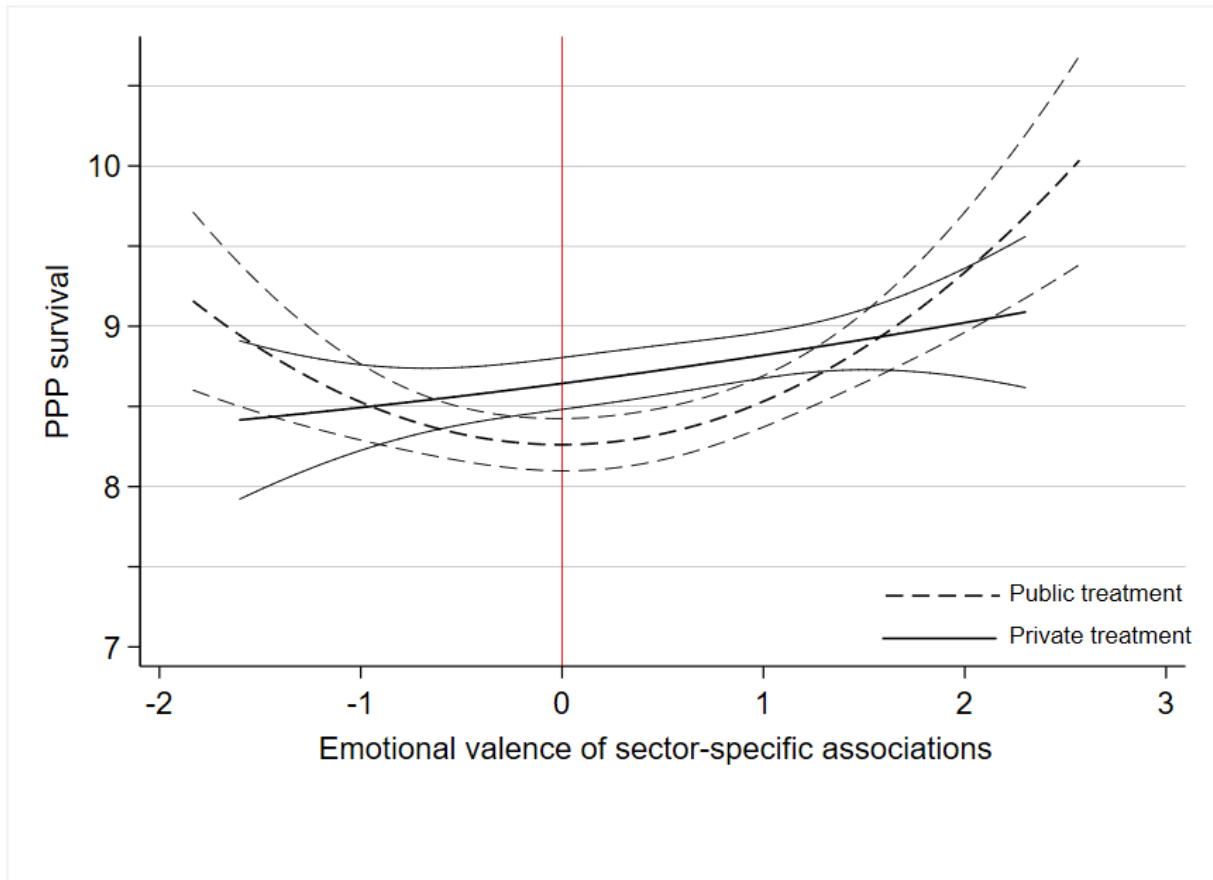
Note: Hypothetical pay-outs in million €.

Figure 2: Smoothed hazard function of *PPP survival* by treatment



Note: Absolute hazard of partners' defection in percent by game period and by treatment; estimated with Epanechnikov kernel.

Figure 3: Quadratic prediction plot of marginal effects of sector-specific associations on *PPP survival* by treatment



APPENDIX (Supplementary online material)

Experimental setup and treatment stimuli. English translation, original German codebook upon request.

1	General introduction
2	Introduction to performance rating task [all study participants]: ‘Please consider the following scenario: As a result of a generous subsidy from the federal government, new building land has been laid out in your home town a few years ago, on which a new large town district is to be built. This project is considered to be very positive for future urban development by all stakeholders. However, in spite of the federal funding granted, the investment costs for the construction of roads and for the development of the site are very high so that the city cannot bear these costs for the development of the neighborhood on its own and, consequently, has established a long-term partnership with a large construction company from the private sector. It has been contractually agreed that costs and returns of this project are going to be shared equally. This partnership has been working very well for several years and to mutual benefit. But suddenly, an unforeseeable problem arises of which none of the two partners are to blame for: There are rumors that the Federal Government’s funding program will be terminated early in the coming years. Consequently, the partnership is now under much more distress. If the neighborhood development was not completed, the whole project could lead to disastrous financial losses. Unfortunately, no special clause was agreed upon for a case like this, so that if one of the two partners now decided to withdraw prematurely from the project, this would leave behind the other partner with all the liabilities and without means of punishment for the other partner.
3	Vignettes and explicit sector specific associations [prime]: Study participants randomly receive one of two vignette treatments, followed by up to 10 rounds of decision on whether they wished to continue the partnership based on trust.
4	A [Public Sector Treatment] Imagine that you are a civil servant in the higher service of the city administration. This means that you decide whether the collaboration with the private company should to be maintained. Please think carefully about the role you are taking on in this experiment. Imagine how it is to work in the public sector, how it feels like. What are the immediate associations that come to your mind in relation to the public sector and to the people working in the public organizations?

	<p>Please specify at least 3 attributes:</p> <p>[open response]</p> <p>[open response]</p> <p>[open response]</p> <p>As a reminder, you are a civil servant in the higher service of the city administration, this means that you are in the position to decide whether the collaboration with the private company is to be maintained or terminated.</p> <p>So far, the collaboration has been very fruitful and, at this moment, the changes in policy are only rumors. You also know that it is an advantage for both the city you represent and the partner company from the private sector to continue the partnership.</p> <p>A glance at your calculations shows you that the partnership project must last only another 10 planning periods in order to generate the maximum total return for all participants. Then each of the two partner organizations would receive € 132 million funding, but only if the partnership is maintained until the end of the 10 planning periods.</p>
<p>B</p>	<p>[Private Sector Treatment]</p> <p>Imagine that you work as a senior manager in the private sector construction firm. This means that you decide whether the collaboration with the private company should to be maintained.</p> <p>Please think carefully about the role you are taking on in this experiment. Imagine how it is to work in the private sector, how it feels like. What are the immediate associations that come to your mind in relation to the private sector and to the people working in private companies?</p> <p>Please specify at least 3 attributes:</p> <p>[open response]</p> <p>[open response]</p> <p>[open response]</p> <p>As a reminder, you are a senior manager working at the private construction firm, this means that you are in the position to decide whether the collaboration with the private company is to be maintained or terminated.</p>

	<p>So far, the collaboration has been very fruitful and, at this moment, the changes in policy are only rumors. You also know that it is an advantage for both the firm you represent and your public sector partner (the city) to continue the partnership.</p> <p>A glance at your calculations shows you that the partnership project must last only another 10 planning periods in order to generate the maximum total return for all participants. Then each of the two partner organizations would receive € 132 million funding, but only if the partnership is maintained until the end of the 10 planning periods.</p>
<p>5</p>	<p>Centipede Game Trials: [maximum of 10 rounds, depending on respondents' decision whether or not to continue the partnership; partner descriptions adapted to prior role framing treatment.]</p>
<p>1</p>	<p>Please decide under these conditions (planning period 1 of 10):</p> <p>If you decide to terminate the partnership now, your organization ([the city administration/the private construction company]) will receive an amount of € 15 million and your partner ([the private construction company/the city administration]) € 0 million.</p> <p>If you work together until the end, your organization will receive € 132 million and your partner will also receive € 132 million.</p> <p>Please note that your partner can also decide at any time to terminate the partnership without prior notice! This would mean that your organization ([the city administration/the private construction company]) will receive € 0 million and your partner ([the private construction company/the city administration]) will receive € 15 million.</p> <p>Do you want to maintain the partnership?</p> <p><input type="checkbox"/> yes</p> <p><input type="checkbox"/> no.</p>
<p>2</p>	<p>Thank you very much!</p> <p>Your partner has also decided to maintain the collaboration.</p> <p>Meanwhile some time has passed and you have to decide again (planning period 2 of 10):</p> <p>If you decide to terminate the partnership now, your organization ([the city administration/the private construction company]) will receive an amount of € 20 million and your partner ([the private construction company/the city administration]) € 0 million.</p>

	<p>Please note that your partner can also decide at any time to terminate the partnership without prior notice! This would mean that your organization ([the city administration/the private construction company]) will receive € 0 million and your partner ([the private construction company/the city administration]) will receive € 20 million.</p> <p>If you work together until the end, your organization will receive € 132 million and your partner will also receive € 132 million.</p> <p>Do you want to maintain the partnership?</p> <p><input type="checkbox"/> yes</p> <p><input type="checkbox"/> no.</p>
<p>3</p>	<p>Thank you very much!</p> <p>Your partner has also decided to maintain the collaboration.</p> <p>Meanwhile some time has passed and you have to decide again (planning period 3 of 10):</p> <p>If you decide to terminate the partnership now, your organization ([the city administration/the private construction company]) will receive an amount of € 25 million and your partner ([the private construction company/the city administration]) € 0 million.</p> <p>Please note that your partner can also decide at any time to terminate the partnership without prior notice! This would mean that your organization ([the city administration/the private construction company]) will receive € 0 million and your partner ([the private construction company/the city administration]) will receive € 25 million.</p> <p>If you work together until the end, your organization will receive € 132 million and your partner will also receive € 132 million.</p> <p>Do you want to maintain the partnership?</p> <p><input type="checkbox"/> yes</p> <p><input type="checkbox"/> no.</p>
<p>4</p>	<p>Thank you very much!</p> <p>Your partner has also decided to maintain the collaboration.</p> <p>Meanwhile some time has passed and you have to decide again (planning period 4 of 10):</p>

	<p>If you decide to terminate the partnership now, your organization ([the city administration/the private construction company]) will receive an amount of € 30 million and your partner ([the private construction company/the city administration]) € 0 million.</p> <p>Please note that your partner can also decide at any time to terminate the partnership without prior notice! This would mean that your organization ([the city administration/the private construction company]) will receive € 0 million and your partner ([the private construction company/the city administration]) will receive € 30 million.</p> <p>If you work together until the end, your organization will receive € 132 million and your partner will also receive € 132 million.</p> <p>Do you want to maintain the partnership?</p> <p><input type="checkbox"/> yes</p> <p><input type="checkbox"/> no.</p>
<p>5</p>	<p>Thank you very much!</p> <p>Your partner has also decided to maintain the collaboration.</p> <p>Meanwhile some time has passed and you have to decide again (planning period 5 of 10):</p> <p>If you decide to terminate the partnership now, your organization ([the city administration/the private construction company]) will receive an amount of € 37.5 million and your partner ([the private construction company/the city administration]) € 0 million.</p> <p>Please note that your partner can also decide at any time to terminate the partnership without prior notice! This would mean that your organization ([the city administration/the private construction company]) will receive € 0 million and your partner ([the private construction company/the city administration]) will receive € 37.5 million.</p> <p>If you work together until the end, your organization will receive € 132 million and your partner will also receive € 132 million.</p> <p>Do you want to maintain the partnership?</p> <p><input type="checkbox"/> yes</p> <p><input type="checkbox"/> no.</p>
<p>6</p>	<p>Thank you very much!</p>

	<p>Your partner has also decided to maintain the collaboration.</p> <p>Meanwhile some time has passed and you have to decide again (planning period 6 of 10):</p> <p>If you decide to terminate the partnership now, your organization ([the city administration/the private construction company]) will receive an amount of € 50 million and your partner ([the private construction company/the city administration]) € 0 million.</p> <p>Please note that your partner can also decide at any time to terminate the partnership without prior notice! This would mean that your organization ([the city administration/the private construction company]) will receive € 0 million and your partner ([the private construction company/the city administration]) will receive € 50 million.</p> <p>If you work together until the end, your organization will receive € 132 million and your partner will also receive € 132 million.</p> <p>Do you want to maintain the partnership?</p> <p><input type="checkbox"/> yes</p> <p><input type="checkbox"/> no.</p>
<p>7</p>	<p>Thank you very much!</p> <p>Your partner has also decided to maintain the collaboration.</p> <p>Meanwhile some time has passed and you have to decide again (planning period 7 of 10):</p> <p>If you decide to terminate the partnership now, your organization ([the city administration/the private construction company]) will receive an amount of € 75 million and your partner ([the private construction company/the city administration]) € 0 million.</p> <p>Please note that your partner can also decide at any time to terminate the partnership without prior notice! This would mean that your organization ([the city administration/the private construction company]) will receive € 0 million and your partner ([the private construction company/the city administration]) will receive € 75 million.</p> <p>If you work together until the end, your organization will receive € 132 million and your partner will also receive € 132 million.</p> <p>Do you want to maintain the partnership?</p> <p><input type="checkbox"/> yes</p>

	<p><input type="checkbox"/> no.</p>
<p>8</p>	<p>Thank you very much!</p> <p>Your partner has also decided to maintain the collaboration.</p> <p>Meanwhile some time has passed and you have to decide again (planning period 8 of 10):</p> <p>If you decide to terminate the partnership now, your organization ([the city administration/the private construction company]) will receive an amount of € 100 million and your partner ([the private construction company/the city administration]) € 0 million.</p> <p>Please note that your partner can also decide at any time to terminate the partnership without prior notice! This would mean that your organization ([the city administration/the private construction company]) will receive € 0 million and your partner ([the private construction company/the city administration]) will receive € 100 million.</p> <p>If you work together until the end, your organization will receive € 132 million and your partner will also receive € 132 million.</p> <p>Do you want to maintain the partnership?</p> <p><input type="checkbox"/> yes</p> <p><input type="checkbox"/> no.</p>
<p>9</p>	<p>Thank you very much!</p> <p>Your partner has also decided to maintain the collaboration.</p> <p>Meanwhile some time has passed and you have to decide again (planning period 9 of 10):</p> <p>If you decide to terminate the partnership now, your organization ([the city administration/the private construction company]) will receive an amount of € 110 million and your partner ([the private construction company/the city administration]) € 0 million.</p> <p>Please note that your partner can also decide at any time to terminate the partnership without prior notice! This would mean that your organization ([the city administration/the private construction company]) will receive € 0 million and your partner ([the private construction company/the city administration]) will receive € 110 million.</p> <p>If you work together until the end, your organization will receive € 132 million and your partner will also receive € 132 million.</p>

	<p>Do you want to maintain the partnership?</p> <p><input type="checkbox"/> yes</p> <p><input type="checkbox"/> no.</p>
10	<p>Thank you very much!</p> <p>Your partner has also decided to maintain the collaboration.</p> <p>Meanwhile some time has passed and you have to decide again (planning period 10 of 10):</p> <p>If you decide to terminate the partnership now, your organization ([the city administration/the private construction company]) will receive an amount of € 125 million and your partner ([the private construction company/the city administration]) € 0 million.</p> <p>Please note that your partner can also decide at any time to terminate the partnership without prior notice! This would mean that your organization ([the city administration/the private construction company]) will receive € 0 million and your partner ([the private construction company/the city administration]) will receive € 125 million.</p> <p>If you work together until the end, your organization will receive € 132 million and your partner will also receive € 132 million.</p> <p>Do you want to maintain the partnership?</p> <p><input type="checkbox"/> yes</p> <p><input type="checkbox"/> no.</p>
6	Probability discounting questionnaire (Madden et al., 2009)
7	Tolerance for uncertainty (Dalbert 1999)
8	PSM (Kim et al. 2012)
9	<p>Explicit attitude about the public sector, single 7-point Likert-type item:</p> <p>‘If you think about the public sector in general your thoughts are...’</p> <p>1=‘very negative’ to 7=‘very positive’.</p>
10	<p>Explicit attitude about the private sector, single 7-point Likert-type item:</p> <p>‘If you think about the private sector in general your thoughts are...’</p> <p>1=‘very negative’ to 7=‘very positive’.</p>
11	Trust in others Yamagishi and Yamagishi (1994)
12	Socio-demographic questionnaire:

	<ul style="list-style-type: none">- year of birth- gender- citizenship- field of study- education- prior work experience and intent to apply to public sector.
13	Numeracy (Weller et al. 2013)
14	Acknowledgement and end of study