Altruist vs Egoist Detection and Individual vs Group Selection in Personnel Management

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Abstract

In the Wason-Selection Task debate it has been suggested that people may be able to detect cheaters but not co-operators or altruists. This position has been challenged. Here we focus on a scenario that is more ecologically valid with regard to different strategies for detecting workers who negatively interact with others (here 'egoists') and positive interactors (here 'altruist'). The results on altruist detection in two-level personnel evaluation tasks (T-PETs), with information on individual and team performance, suggested a disregard of the team performance and a resulting "Tragedy of Personnel Evaluation". Experiment 1 transfers the idea of altruist detection in a personnel evaluation and personnel selection task (von Sydow & Braus, 2016) to egoist detection and explores whether there are analogous problems for egoist detection. Experiment 2 explores egoist and altruist detection in more realistic settings where individual and group-selection may affect our sampling of the interactor.

Keywords: Altruist/Egoist Detection; Wason Selection Task; Personal Selection Task; Tragedy of Personnel Selection; Group Selection; Learning Correlations; Decision Making

Introduction

In an influential debate on hypothesis-testing (Wason Selection Tasks, WST), it has been suggested that in social-contract situations people are adapted for cheater detection but not for co-operator or altruist detection (Cosmides, 1989). These proposals have contributed to differentiating between checking deontic rules and testing descriptive hypotheses (Oaksford & Chater, 1994; Beller, 2001; von Sydow, 2006). Despite evidence for subclasses within the deontic domain (Fiddick, Cosmides, & Tooby, 2000), other research shows that reasoning with standard deontic rules (including social contracts) seems to be a quite systematic faculty resembling deontic logic (Beller, 2001; Bucciarelli & Johnson-Laird, 2005; von Sydow, 2006) and depends on the goals pursued (von Sydow, 2006; Rand, Dreber, Ellingsen, Fudenberg, & Nowak, 2009; Sperber & Girotto, 2002). However, the WST-paradigm has also been criticised as being too specific to address issues of real-life co-operation (Sperber & Girotto, 2002).

Von Sydow & Braus (2016) explored participants' ability as personnel managers to detect how employees positively interacted with others' performance. Research in organizational and social psychology has acknowledged the importance of teams beyond mere individual contributions (Mathieu, Maynard, Rapp, & Gilson, 2008; Memmert, Plessner, Hüttermann, Froese, Peterhänsel, & Unkelbach, 2015) and the crucial role of prosocial or altruistic extra-role or role behaviours in teams (e.g., Li, Kirkman, & Porter, 2014). Our tasks were more complex than WST and used two-level personnel selection tasks (T-PETs; in von Sydow & Braus, 2016). In these T-PETs, participants obtained information about employees' performance on the direct individual level and on the overall group level. The presence of the altruist correlated consistently, reliably, and strongly with the teams' overall performance (r = .99). Nonetheless, people tended to evaluate the altruist to be worst for the team, mostly based only on the individual information, and tended to ostracise him or her in selection tasks. This led us to suggest a potential "tragedy of personnel selection".

To explore the controversial asymmetry between altruist and egoist selection discussed in the WST literature in a more complex setting, and to explore the generality of the Tragedy of Personal Selection, Experiment 1 investigates T-PETs not for altruist detection, but for *egoist* detection. Experiment 2 compares egoist and altruist detection in a single experiment and explores further potential factors of group vs. individual selection. This is broadly in line with the increasing influence of multi-level modelling in biology (Wilson & Wilson, 2007), and personnel psychology (Polyhart, 2012). Furthermore, we explore the resultant effect of sampling (Fiedler, 2008). We will suggest that group selection could lead to greater altruist and egoist detection, but that this does not necessarily imply deeper understanding. Thus we suggest that in such a perhaps ecologically more valid scenario several further factors come into play over and beyond a mere potential difference between egoist and altruist detection.

Experiment 1

The first experiment explores whether the Tragedy of Personnel Evaluation is unique to altruist detection, or whether there is an analogous phenomenon for egoist detection as well. Here 'egoists' have the *highest individual earnings* in the team while in fact *most negatively affecting the team's overall performance*. In this study participants were again acting as personnel managers, repeatedly making personnel evaluations and selections.

Table 1 shows the average earnings of the negative interactor, the egoist (*E*), and, depending on the latter's presence or absence, the average earnings of the normal workers in the four conditions. The conditions vary homogeneous and heterogeneous earnings for the normal workers (C1, normal worker with homogeneous earnings condition; C4, most heterogeneous earnings of the normal workers) to investigate participants' sensitivity to small differences in their impact on the individual level.

Design

Table 1: Mean earnings of normal workers (NW: *N1* to *N4*) and of 'egoist' worker (*E*), overall earnings with or without the egoist in the four conditions (C1 to C4), and resulting predictions

	C1	C2	C3	C4
		Predictions		
Indivi-dual	E>N1=N2 =N3=N4	E>N1>N2 =N3=N4	E>N1=N2 >N3=N4	E>N1>N2 >N3>N4
Over-all	N1=N2= N3=N4>E	N1>N2= N3=N4>E	N1=N2> N3=N4>E	N1>N2> N3>N4>E
		Mean of earnings without egoist		
N1	3000	3300	3400	2600
N2	3000	2900	2400	3200
N3	3000	2900	2600	2800
N4	3000	2900	2600	2400
		Mean of earnings with egoist		
N1	2000	2300	2400	2600
N2	2000	1900	2400	2200
N3	2000	1900	1600	1800
N4	2000	1900	1600	1400
E	3400	3400	3400	3400
		Mean of overall earnings of a group		
With-out E	12000	12000	12000	12000
With E	9400	9400	9400	9400

Method

Participants 161 participants from MTURK passed a first participation-criterion (time spent on the first page > 20 sec. and < 6 min.) and began the task. 120 participants finished the experiment and were included in the analysis (52% male; mean age 33), most of them with a high school or even a university degree (59% Bachelor's or Master's; 38% high school). The volunteers obtained rewards of $1. Participants were randomly assigned to one of four conditions (cf. Table 1).

Material and procedure The crucial difference to prior work was that we replaced altruist detection by egoist detection (Table 1). Apart from changed individual and overall earnings, the scenario, T-PET procedure, and dependent variables (von Sydow & Braus, 2016). But we were now concerned with *individually best* performing 'egoists', whose presence correlated consistently and most *negatively* with the team's overall performance. As in the altruist detection task, participants in each round obtained overview information in tables about workers' individual earnings, together with their photographs and information about overall earnings of the team. The presentation order of the pictures was randomized. Again there were only five workers, with four workers per shift – thus only five possible team configurations. There were 40 rounds and four test phases, one after every ten rounds. The first three test phases included rating-tasks and a team selection task only; in the final test phase we asked participants additionally to choose the employee of highest and lowest utility, and to comment on the task and their decision.

Results

In all conditions, the average ratings (Figure 1) resemble more closely the predictions based on individual rather than overall team-contributions (cf. Table 1). An ANOVA with the between-subjects factor Conditions and the within-subjects factors Workers and Phases (in a multivariate Pillai-Spur Test, PST) showed significant effects of Workers, $F(4, 110) = 95.9$, $p < .001$, Workers × Conditions, $F(12, 336) = 21.9$, $p < .001$, and Phases, $F(3, 111) = 3.41$, $p < .05$, and a marginally significant effect of Phase × Person, Workers × Conditions, $F(12, 102) = 1.78$, $p = .06$.

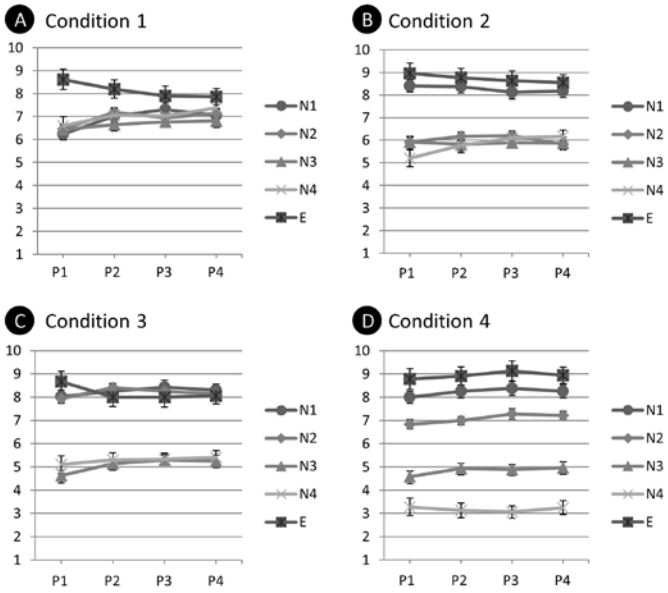

Figure 1: Average ratings (with SE) in Experiment 1 for the four normal workers (*N*) and egoist worker (*E*) in the test phases P1 to P4 of Conditions 1, 2, 3, and 4 (Panels A to D)

In Condition 1, the egoist is characterized by higher ratings than the other four workers throughout all phases; main effect of Worker: $F(4, 26) = 4.19$, $p < .01$. In Condition 2, there was again only a reliable effect of Workers, PST, $F(4, 24) = 25.2$, $p < .001$. Bonferroni-corrected post hoc comparisons showed no differences between the egoist and normal worker 1 (E, N1), predicted to be the highest normal worker ($p = 1.00$); but N1, as predicted, had a higher rating than the other normal workers, which was also the case for the egoist (all, $p < .001$). In Condition 3, again only the factor Workers was significant

(PST, $F(4, 22) = 24.1$, $p < .001$). Bonferroni-corrected post hoc comparisons showed that the egoist was not rated higher than the normal workers predicted to be highest (N1, N2) (both $p = 1.00$), but that the worker in this group, as well as the egoist, reliably differed from the workers in the second group of normal workers (N3, N4; all $p < .001$). Condition 4 again showed an overall effect only for the factor Worker (PST, $F(4, 28) = 58.6$, $p < .001$), and in corrected post hoc comparisons significant effects even of all five workers in the order predicted by the individual earnings (all $p < .01$).

The results of the Personnel Selection Task (Figure 2) show that the majority selected teams with optimal earnings on the individual level (black; individual-related selections). Only a few selected the team *without* the egoist (from five possible teams), even though this team had the best overall performance (dark gray; team-related selections). The remaining selections (light gray) selected the egoist for the team, along with other, individually non-optimal workers. With regard to temporal changes, there is an apparent increase in the proportion of team-related selections (dark gray) from Phases 1 (9%) to 4 (23%); $\chi^2(1, N = 240) = 8.00$, $p < .01$. But even in the final test phase, Phase 4, the individual-related selections over all conditions occurred more frequently than the team-related ones, $\chi^2(1, N = 120) = 34.7$, $p < .001$.

The highest-utility task (Figure 3, Panel A) reveals relatively frequent 'egoist'-judgments (black). In all conditions these judgments were clearly above chance level ($\chi^2(1, N = 31) = 63.9$, $p < .001$; $\chi^2(1, N = 30) = 44.5$, $p < .001$; $\chi^2(1, N = 27) = 15.8$, $p < .001$; $\chi^2(1, N = 32) = 47.5$, $p < .001$). Considering the team-related judgments (dark gray), they are also above chance level relative to the other ones (light gray), $\chi^2(1, N = 31) = 49.0$, $p < .001$ (C2 to C4).

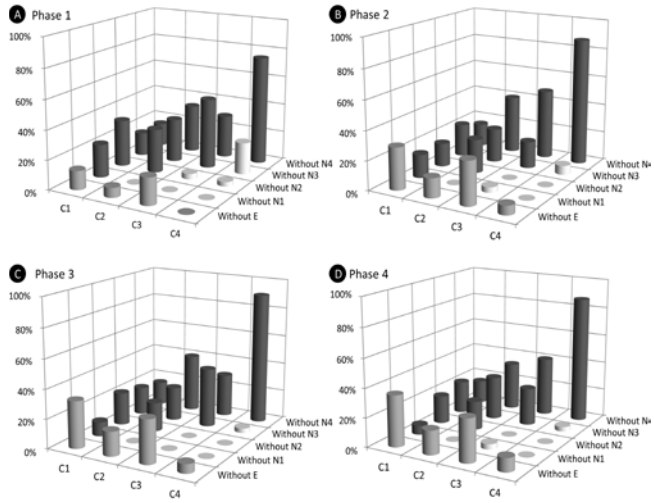

Figure 2. Results of the personnel selection task in the four test phases of Experiment 1, showing the proportion of 'managers' choosing a team of four out of five, thus excluding worker *N1*, *N2*, *N3*, *N4*, or the egoist worker *E*. Individual-related optimal selections are marked in black, with team-related optimal selections in dark gray and other selections in light gray.

In the lowest-utility task (Fig. 3B), a similar pattern can be recognized. The individual-related selections (black) were chosen more often than chance level, $\chi^2(1, N = 120) = 300.8$, $p < .001$. In the three conditions (C2 to C4), where one can contrast the team-related judgments (egoist has the lowest utility; dark gray) with judgments that were neither individually nor on group-level optimal (light gray), the team-related judgments overall occurred reliably more often than expected by chance (exact bin. test, $N = 12$, $p < .001$).

As to the comments, 21% participants mentioned explicitly that the individual and overall group-level contributions of a worker differ, or that there are interactions between participants. These insightful comments were highly associated with group-level selections and ratings.

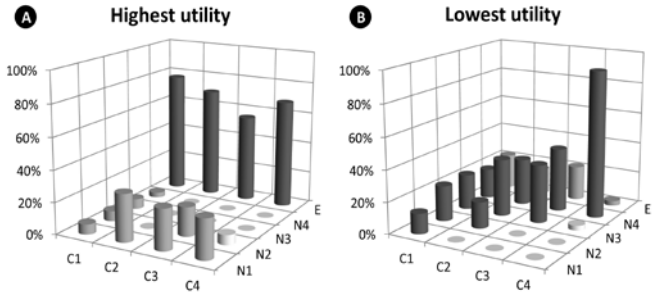

Figure 3. Percentage of 'managers' choosing either a normal worker (*N*) or the egoist worker (*E*) as of the highest (Panel A) or lowest (Panel B) utility for the company (Conditions C1, C2, C3, C4). The individual-related choices are marked in black, the team-related ones in dark gray and the neither-individual-nor-team-related ones in light gray.

Discussion

The results of Experiment 1 show that egoist detection seems to be affected by similar problems as altruist detection (von Sydow & Braus, 2016). When the *negative* interactor individually contributed the highest earnings but led overall to the lowest group earnings, the majority of participants nonetheless rated the egoist as most valuable. Moreover, in the personnel selection task they even systematically chose the egoist for the team, even though the latter consistently performed the worst. This was the case even though participants were sensitive to relatively small individual differences. Thus the results suggest a kind of tragedy of personnel selection as well with regard to 'egoists' or negative interactors.

In comparison to the results on altruist detection by von Sydow & Braus (2016), which seem comparable in population and method, there is perhaps a slight advantage of egoist over altruist detection. In particular, there were significantly more insightful comments for egoist than for altruist detection, $\chi^2(1, N = 240) = 7.53$, $p < .01$. This suggests that the content of egoist versus altruist detection leads to different interaction detection rates. However, the overall findings point rather to the similarity between altruist and

egoist detection. There also seems to be a Tragedy of Personnel Evaluation with regard to egoist detection.

Experiment 2

This experiment explores the potential effect of personnel selection on the individual versus group level and resulting distortions linked to sampling only particular information (thus favoring learning of specific relationships or not). We combine these issues with an investigation of egoist and altruist detection in a single experiment. We propose the hypothesis that group in contrast to individual selection may at least behaviourally increase selections corresponding to the group-level performance. However, deeper insight is predicted to depend on sampling effects that may affect both individual and group selection. To test the effect of sampling, the participants were given the opportunity to influence the material by their selections. Sampling may imply a greater inclusion of the interactor, which will lead to a better learning of the interactor's impact either on the individual or on the group level and hence to a solution of the Tragedy of Personnel Selection. In contrast, if sampling leads to exclusion of the interactor, a correct selection needs not to improve the understanding of the interactor's impact.

Design

Experiment 2 investigates how individual versus group selection and the presence of an 'altruist' versus an 'egoist' influence personnel selection and evaluations (Table 2). Apart from this, the conditions used almost identical scenarios and the interactors had comparable effects on the group level. The egoist is characterized by the highest and the altruist by the lowest individual earning. In contrast to the individual earnings, the presence of the egoist leads to lower overall earnings of the group, whereas that of the altruist yields greater overall earnings for the group.

Table 2: Selection and interactor conditions and mean of earnings for normal workers (NW), altruist and overall for four conditions.

Condition	C1	C2	C3	C4
Selection type	Individual	Individual	Group	Group
Interactor type	Altruist	Egoist	Altruist	Egoist
	Mean of earnings			
NW with altruist/egoist	3000	1500	3000	1500
NW without altruist/egoist	2000	2500	2000	2500
Altruist/egoist	1500	3000	1500	3000
	Mean of overall earnings of a group			
With altruist/egoist	7500	6000	7500	6000
Without altruist/egoist	6000	7500	6000	7500

Method

Participants 182 participants from MTURK began the task. 119 participants passed the strict selection criteria (time spent on first page; correct rephrasing the instructions), finished the task, and were included in the analysis (51% male; mean age 35); most of them had a degree (65% Bachelor's or Master's; 35% high school). The volunteers obtained rewards of $1. Participants were randomly assigned to one of four conditions (cf. Table 2).

Material and procedure The material and procedure build on previous T-PETs but vary in some aspects. The data is again shown for each day or shift, containing individual and overall earnings. Whereas previous T-PETs involved one group (with different member configurations) only, here we also presented two groups, each with 3 employees. During the experiment, participants received data on a total of 10 employees and 81 days (rounds). Moreover, in contrast to former T-PETs the participants' judgments in personnel selection tasks influenced the materials presented to the participants. This task was repeated 11 times. On the first day of each of the 10 test phases (and in a final test phase), the altruist/egoist and 5 randomly assigned normal workers were presented. Based on the selection in the test phase, participants selected 3 out of 6 employees (individual conditions) or one of two groups (group conditions). This selected group or these individuals were *ex*cluded from the following 7 days (rounds). From the 7 employees left, we created the two groups in the successive 7 days, so that each one of the employees left was excluded for one day. Although we added some noise (SD = 600€) to the individual earnings, the presence of the interactor in such trials still strongly correlated with a higher overall outcome (r = .95-.98). In every second test phase (starting with the second phase), the participants additionally had to rate the 10 employees before selection. On the last day, at test phase 11, the participants had to complete a rating and selection task (here without consequences) as well as the utility-task (cf. Experiment 1) and a Need-For-Cognition task (NFC; Cacioppo, Petty & Kao, 1984); and finally to comment on the task.

Predictions

- Hypothesis 1 (H1): Participants may base their selections (partly) on the observed performance in the test phases, with the selection focusing them either on the group or the individual level. This would entail more selections optimal on the group level in the group condition than in the individual conditions: C3 = C4 > C2 = C1.
- However, participants in line with H1 will tend to exclude the interactor in C4 (group selection) and C1 (individual selection) and tend to include the interactor in C3 (group selection) and C2 (individual selection). Based on these expected sampling effects, one may derive the following hypothesis:

- Hypothesis 2 (H2): People in the inclusion conditions will learn more about the individual earnings, which vice-versa would lower judgments in line with adequate group-level predictions in the inclusion conditions: C1 = C4 > C2 = C3.
- Hypothesis 3 (H3): Alternatively (or additionally), in the inclusion conditions people may start to realize the major impact of the interactor on group earnings, with inverse implications for group-level results: C1 = C4 < C2 = C3.

H2 and H3 may both apply and cancel each other out. Alternatively one may find different effects over time (first H2 then H3). We predict that the hypotheses will have a major impact on different dependent variables: H1 may particularly affect the used selection task which may be dominated by the currently shown data. H2 or H3 may dominate the overall results in the rating and utility tasks. With regard to insight in the two-level nature of the task in the comments seems normally to be limited by realizing the group level effects; thus insight should follow the pattern of H3.

Results

As expected, different clusters of dependent variables referring to performance effects H1 (here selection tasks) and to effects of understanding, H2 versus H3 (evaluation tasks) reveal differential results: Considering the personnel selection task, compared to individual selection (Figure 5, Panel A), the group selection as expected (H1) appears to lead to greater (overall optimal) exclusion of the egoist and inclusion of the altruist. However, the results descriptively show optimal group-level answers in the rank order of C4 > C3 >> C1 > C2. This suggests a main effect in line with H1 and an additional effect, even for this selection variable, in line with H2. Inferentially, the aggregated correct selections of each participant over the 11 selections revealed a strong effect of Selection type ($F(1, 115)=119.60$, $p<.001$, $\eta^2=.52$) and a slight interaction effect of Selection and Interactor types, $F(1, 115)=9.17$, $p=.003$, $\eta^2=.07$. As a high correlation between the accuracy of selection and amount of earnings suggests, the earnings replicate the strong positive effect of Selection type, $F(1,115)=128.18$, $p<.001$, $\eta^2=.52$, Interactor type: $F(1,115)=11.10$, $p=.001$, $\eta^2=.09$, and Phase: $F(6, 687) = 2.29$, $p< .05$, $\eta^2=.02$.

The rating task (Figure 4) seems roughly to reflect the individual pay-off structure affected by sampling (H2). The altruist has lower ratings than the other workers, and the egoist is rated more positively. Comparing the ratings of the interactor to all normal workers, the interactor differs highly significantly across all 5 measurements (R1-R5), R1: $F(1,116) = 1345.68$, $p < .001$; R2: $F(1,116) = 1369.64$, $p < .001$; R3: $F(1,116) = 1540.53$, $p < .001$; R4: $F(1,116) = 2028.63$, $p < .001$; R5: $F(1,116) = 2731.81$, $p< .001$.

The highest-utility and lowest-utility tasks (Figure 5, Panel B) seem to mirror mainly the individual earnings of the employees (high rate of egoists in the highest utility task, and of altruist in the lowest utility task). Thus the Interactor type affects the accuracy of this task (highest: $\chi^2(1,119) =11,84$, $p=.001$; lowest: $\chi^2(1,119) =19,02$, $p<.001$); but the selection type had no impact.

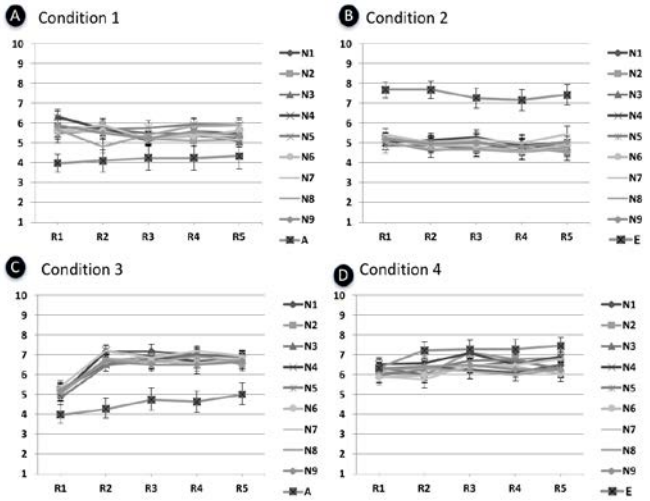

Figure 4: Average ratings (with SE) for the normal workers (*N1-9)* and the altruist/egoist worker (*A, E*) of Conditions C1, C2, C3 and C4 (*Panels A to D*).

Insightful comments (Panel C), in line with H3, showed in C2 and C3 marginally significantly higher correct comments than in C1 and C4, $\chi^2(1,119) =3,55$, $p = .06$. Participants, commenting correctly, revealed greater aggregated correct selections ($t(51)=-2,28$, $p < .01$) and ratings ($t(56)=-2,80$, $p < .01$), and tended to choose the person with the highest or lowest overall utility more frequently, highest: $\chi^2(1,119) = 15,77$, $p < .001$; lowest: $\chi^2(1,119) = 3,05$, $p = .08$. Participants with insightful comments can be characterized by higher NFC-Scores: $t(117) = -2,65$, $p < .01$.

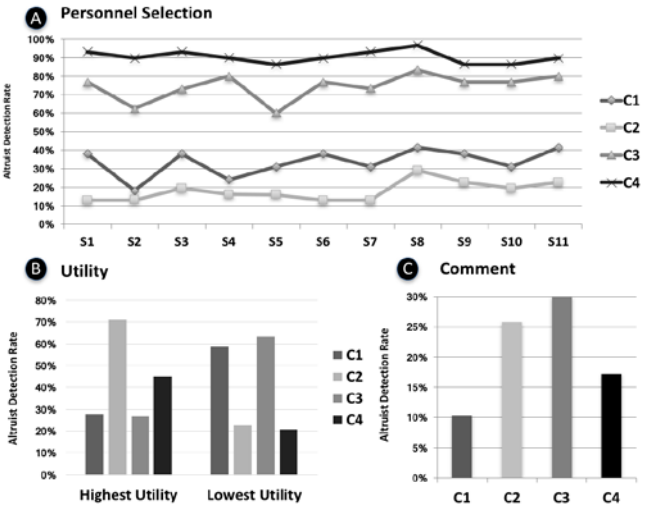

Figure 5: Average correct answer rate for Conditions 1, 2, 3 and 4 (*C1-C4*) of the Selection, Utility- and Comment Tasks (*Panel A to C*).

Discussion

Experiment 2 shows intricate influences of sampling on the egoist and altruist detection in group and individual

selection scenarios. Group selection, at least on a direct performance level in the selection tasks, leads to greater overall optimal selections compared to individual selection (H1). In addition, group selection increases economic outcomes. Considering the accuracy of personnel evaluation, the results create a more complex pattern. Egoist versus altruist detection does not have a great impact; neither does Individual vs. Group-Selection. Sampling processes seem to matter and can have simultaneous opposed effects. The ratings and the highest/lowest utility-tasks show that gaining more information about the interactor leads to stronger individual-based understanding (H2). Insight in the comments nonetheless revealed, as predicted, that gathering information about the interactor also increased the detection of group level effects (H3). In line with this finding, insightful comments were associated with the NFC-Score.

General Discussion

Experiment 1 shows that egoist detection, as with similar altruist-detection tasks, may systematically lead to judging the egoist as best for a company although he clearly correlates strongly with negative overall team performance. Although the results suggest a slight advantage of egoist over altruist detection, both show basically similar results, with participants in both scenarios falling prey to a Tragedy of Personnel Selection. In Experiment 2, instead of egoist versus altruist detection, other factors such as group versus individual selection (with group selection improving performance) and sampling processes (in different ways affecting understanding on individual and group levels) more strongly influenced participants' judgments.

With regard to the personnel selection literature (e.g., Polyhart, 2012; Li, Kirkman, & Porter, 2014), the results warn us against the generality of the suggested Tragedy of Personnel Selection shown here to affect not only altruist but also egoist detection. With regard to the Wason Selection Task debate (e.g., von Sydow, 2016; Sperber & Girotto, 2002), we found no large differences between altruist and egoistic detection in the T-PETs (however, a small one). The results more generally pose the question as to how far the difficulties detecting the strongest overall correlation of variables' presence with overall outcome points to problems linked to Simpson's Paradox (Fiedler et al., 2003; Sydow et al., 2016; Waldmann & Hagmayer, 2001); also whether it is a negative side effect of people's constructing detailed logical or causal models over and above optimizing observed utilities (e.g., Funke, 2001; Hagmayer & Meder, 2013; Osman, 2010; Sloman & Hagmayer, 2006; von Sydow, 2016; Waldmann & Hagmayer, 2001), with the disadvantage that one tends to neglect small correlations, pathways, exogeneities or interactions, even if they tragically dominate a scenario.

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