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Article

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Can group rewards promote helping in asymmetrically imbalanced task relationships?

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Abstract: This paper investigated whether group-level rewards can counteract the negative effects of asymmetric task dependence. Previous research has found that asymmetry (an imbalance in task-related resources, such as work inputs, knowledge, or skills) is correlated with lower levels of helping behavior. In this study, 182 students participated in a work simulation that manipulated symmetry and reward interdependence, and measured helpful behaviors provided to the dependent. The results demonstrate that asymmetry indeed leads to selfish behavior. However, group-level rewards are an effective way to motivate resource controllers to give help to their dependents. Interestingly, group rewards motivate over and above the benefit received from the reward itself—although resource controllers could maximize their own benefit with 2 helping behaviors per round, they gave on average 3.7 to 6.4 helping behaviors per round (95% confidence interval based on 10,000 bootstrap samples). The results demonstrate that in an asymmetrically dependent relationship, group-level rewards can motivate helping behavior over and above rational self-interest.

Subjects: Power; Applied Social Psychology; Group Processes; Work & Organizational Psychology; Introductory Work/Organizational Psychology; Leadership; Work Motivation

Keywords: asymmetric dependence; helping; interpersonal citizenship behavior; power; task dependence

ABOUT THE AUTHORS

Christopher Poile is an assistant professor of human resources and organizational behavior at the Edwards School of Business, University of Saskatchewan, Canada. He received his PhD in management sciences at the University of Waterloo, Canada. This research report reflects his interest in power, task dependence, and citizenship behaviors. It was inspired by qualitative work studying coordination and other human aspects of software engineering at Microsoft.

Frank Safayeni is a professor of management sciences in the Faculty of Engineering, University of Waterloo, Canada. He received his PhD from University of Victoria, Canada. He is the principal investigator of the Uncertainty Management Research Group at Waterloo. His research interests include modeling and simulation of organizational interactions, social-technical studies of manufacturing systems, organizational effectiveness, and studies of knowledge creation and problem-solving in groups.

PUBLIC INTEREST STATEMENT

Asymmetric dependence (when some co-workers have more resources than others, e.g. information, skills, or knowledge) is common in modern work. Research has shown that having more resources tends to motivate selfish behavior, and the resource controller may not be motivated to do extra work to help co-workers in need (called helping behavior). One way to motivate helping behavior would be balance task relationships to reduce the asymmetry. But this can be difficult and costly. As an alternative, this study found that group-level rewards can motivate resource controllers to help their dependent co-workers. For example, managers can motivate helping behavior by including the co-workers' performance on the individuals' performance review. Group-level rewards can be an easier and less costly solution to the problem of asymmetric dependence.

1. Introduction

Workers often depend on the resources provided by co-workers. When a worker needs resources, but provides little in return, that worker is *asymmetrically dependent* on those resource-controlling co-workers. For example, an academic is asymmetrically dependent on a colleague when that colleague controls a valuable data-set and analysis, especially when the colleague does not care whether their project is published or not. Asymmetric dependence may cause problems in work relationships because research suggests that those who control resources are less motivated to provide help to their dependents (de Jong, Van der Vegt, & Molleman, 2007). The colleague may need little from the relationship and will be less motivated to go above and beyond to help their dependent (Bowler & Brass, 2006). This is an important issue because asymmetrically imbalanced resource control is increasingly common in knowledge work—it is difficult to have a perfectly symmetrical distribution of work, skills, knowledge, role tenure, or natural ability (Van der Vegt, de Jong, Bunderson, & Molleman, 2010).

This question motivated the current study: Can group-level rewards promote helping behavior and mitigate some of the negative effects of asymmetric dependence? Group-level rewards have been found to increase helping behavior in teams that are *symmetrically* interdependent (Wageman & Baker, 1997). However, the positive effects of group rewards have yet to be tested in the context of *asymmetric* dependence. For instance, after finding lowered helping and trust, de Jong et al. (2007) called for research to investigate whether group rewards could improve helping in asymmetrically imbalanced teams. The present study helps answer this call by directly testing this possibility. This is an important question because encouraging helping behavior through the reward structure would be considerably easier than through a change in the underlying task asymmetry.

2. Background and hypotheses

A worker is task-dependent on a colleague when the worker needs task-related resources to complete the job. Task-related resources can include information, intermediate work inputs, decisions or contingencies for action (Thompson, 1967), knowledge, experience, or skills (Van der Vegt et al., 2010), even advice, or emotional support (Blau, 1964). Colleagues are *symmetrically dependent* when they depend on one another's resources to roughly the same extent. They are *asymmetrically dependent* when one worker has more resources and needs less resources from a colleague than vice versa. Symmetry and asymmetry are relational and can change, since *B* is task-dependent on *A* only to the extent that *A* has resources *B* needs to get the job done (Van der Vegt et al., 2010). *Helping behavior* refers to going above and beyond one's strict job requirements to voluntarily give task-related resources to a dependent, which helps the dependent complete a task (also called *task-focused interpersonal citizenship behavior*; Settoon & Mossholder, 2002). Helping behavior is interesting to both researchers and practitioners because it has a stronger effect on team and organizational performance than other forms of citizenship behavior (Podsakoff & MacKenzie, 1997).

Given that asymmetry is likely common at work, scholars have been interested in how asymmetric dependence might change resource controllers' motivations to help their dependent colleagues. Research on power and dependence strongly suggests that a position of resource control creates a power relationship (for a comprehensive review, see Galinsky, Rucker, & Magee, 2015). Resource control confers a sense of power, activates behavioral approach and disinhibition systems, focuses one on personal goals, and distances one from the point of view, needs, and perspective of one's dependents (Blader & Chen, 2012; Magee & Smith, 2013). Resource controllers hold the cards and need little in return from their dependent co-workers (Rusbult & Van Lange, 2003). Drawing on this research, organizational scholars have argued that, all else being equal, more resource control imbalance should lead to the same or lower levels of voluntary helping, especially when that helping comes at personal expense (Bowler & Brass, 2006; de Jong et al., 2007; Van der Vegt et al., 2010). The first hypothesis is derived from this line of research:

> **Hypothesis 1**. Compared to symmetric task dependence, asymmetric task dependence motivates lower levels of helping behavior from the resource controller to the dependent.

We understand less about the effects of group-level rewards on helping behavior in the context of asymmetric dependence. *Reward interdependence* refers to the extent to which an individual's rewards (positive or negative) depend on the performance of others (Wageman, 1995). In practice, reward interdependence is a continuum. Complete interdependence, such as a gainsharing plan, means the individual is rewarded entirely based on the group's performance. At the other extreme is complete reward independence, such as a salesperson's commission, where individuals are rewarded based on their own performance, regardless of their group's or co-worker's performance. Between these two extremes are forms of hybrid reward interdependence (Wageman, 1995). For simplicity, in this article we focus on group vs. individual-level rewards. We will use *group-level rewards* to refer to some reward interdependence, such as when individuals are evaluated both on their own performance as well as their team's success. We will use *individual-level rewards* to refer to reward independence, such as when individuals are evaluated solely on their own performance.

Research has demonstrated that group-level rewards have a positive effect on performance, but only when the group is symmetrically dependent (Wageman, 1995). This is usually referred to as reward-task interdependence fit. This fit is supported by multiple meta-analyses (Johnson & Johnson, 1989; Stanne, Johnson, & Johnson, 1999). However, the direct effect of group rewards on helping behavior (rather than on task performance) is less clear cut. Multiple studies have found no independent effect (Allen, Sargent, & Bradley, 2003; Wageman & Baker, 1997) or a weak independent effect of group rewards on helping (Comeau & Griffith, 2005). In summary, while there is evidence that the fit between symmetric dependence and group rewards encourages group performance, there is little direct evidence that the increased performance is due to helping behavior. Likewise, there is little evidence that group rewards independently affect helping behavior.

However, there are strong theoretical arguments that group rewards should have an independent effect on the motivation to help. First, social interdependence theory (Deutsch, 1949; Johnson & Johnson, 1989; Stanne et al., 1999) suggests group rewards create a cooperative situation (rather than competitive), and therefore encourage resource controllers to help their dependents. In cooperative situations, members perceive a shared fate, look out for the interests of the others, and share information (Beersma, Hollenbeck, Humphrey, Moon, & Conlon, 2003). Second, the rational actor model underlying interdependence theory suggests that group rewards will create a rational motivation for resource controllers to help their dependents (Kelley et al., 2003; Kelley & Thibaut, 1978). That is, helping will benefit resource controllers because they will take a share of the higher group rewards. Third, group rewards may activate the group-level constructs of reciprocity, group cohesion, and organizational commitment, which together will motivate helping a colleague in need (Frenkel & Sanders, 2007).

The motivating effect of group rewards should be particularly strong in situations of asymmetric dependence. Without group rewards, the resource controller will be motivated by the self-serving effects of asymmetric dependence (i.e. power; Blader & Chen, 2012). However, group rewards may highlight a communal and mutually dependent relationship, which may have been present in a symmetric dependence, but was lacking in an asymmetric dependence. Together, the group rewards and the resulting cooperative situation will motivate helping, even when that helpful behavior comes at a net personal cost. That is, the helping behavior should go above and beyond rational self-interest. Stated formally:

> **Hypothesis 2**. In both symmetric and asymmetric dependence, group rewards motivate higher levels of helping behavior from the resource controller to the dependent. This effect will be stronger on resource controllers in asymmetric dependencies.

3. Method

We developed a computer-based work simulation to test the two hypotheses. The goal of the experimental situation was to create a task-related dependence between two participants. The experiment needed to enable the independent manipulation of symmetry of task dependence

(symmetric vs. asymmetric) and reward interdependence (individual vs. group) while holding other aspects of the task relationship constant. A secondary goal was that the dependent variable (helping provided from the resource controller to their colleague) needed to be an objective behavioral measure, and the helping behavior needed to have a clear personal cost to resource controller. These goals help meet recent calls for more ecologically valid experimental situations of task-related dependence, which draw from advances made in behavioral economics (Sturm & Antonakis, 2015).

The work simulation used a card game where drawing cards represented "doing work" to reach a goal. The simulation modeled a straightforward task dependency, often seen in manufacturing, engineering, or knowledge work. Worker "*A*" did work (drew cards) to complete *A*'s task requirements (reached a hand of cards that met or exceeded *A*'s goal number). Worker *A* would then send this completed work to worker "*B*" Worker *B* would then use this work as a foundation, and build on top of it to complete *B*'s task requirements (reach a hand of cards that, including the cards sent by *A*, met or exceeded *B*'s goal number). This would complete one "round" of work. As in many real-life task relationships, worker *A* could do the bare minimum amount of work and send that to *B*. Or, *A* could go above and beyond the requirements to do extra work. This extra work would reduce *B*'s workload and make it easier for *B* to reach *B*'s own goal. Worker *A*'s extra work was discretionary, and helpful from the point of view of *B*. However, *A*'s extra work was personally costly, since each card cost $1 to draw, and workers had a maximum budget per round. Symmetry of task dependence was created by manipulating whether the roles were reversed in the next round. Reward interdependence was created by manipulating how *A* and *B* were rewarded for successfully completing a round of work. Helping behavior (the dependent variable) was measured by the amount of extra voluntary work done by the resource controller.

For a concrete example of one round of work, suppose *A*'s goal was 8, and *B*'s goal was 24. At the start of the round, *A* would draw cards and build a hand of two cards that would meet or exceed the goal (e.g. a 3♠ and a 5♦). The simulation increased the value of the cards over time, which modeled "more effort leads to higher quality work." Thus, if *A* wanted to help *B*, *A* simply needed to draw more cards (at a higher personal cost). For instance, if *B* had a goal of 24 and *A* sent a hand worth 8, *B* would need to draw a hand worth 16 to reach their personal goal. If *A* chose to draw extra cards and then sent a hand worth 11, then *B* would only need to draw a hand worth 13 (see Figures 1 and 2).

3.1. Participants and design

Undergraduate business students ($n = 182$, 78 female, $M_{age} = 20.2$ *years*) at a large university in western Canada were randomly paired into dyads and assigned to four conditions: 2 (symmetric vs. asymmetric dependence) × 2 (individual vs. group reward). Two dyads were removed for misunderstanding the instructions and failing the control questions. The number of dyads per condition is reported in Table 1.

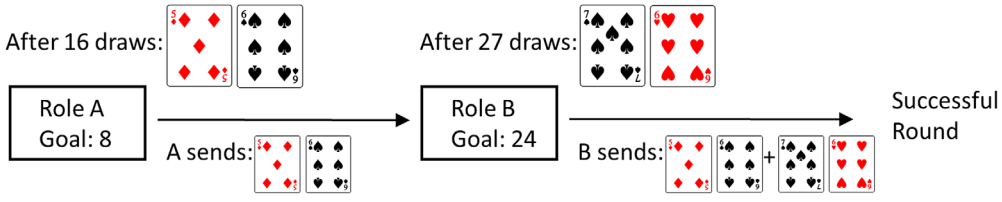

Figure 1. An example round. Role A draws cards until reaching A's goal, then sends those cards to Role B, who builds on those cards to reach B's goal. A can help B by drawing more cards at a personal cost (here, A has helped by sending a hand worth 11).

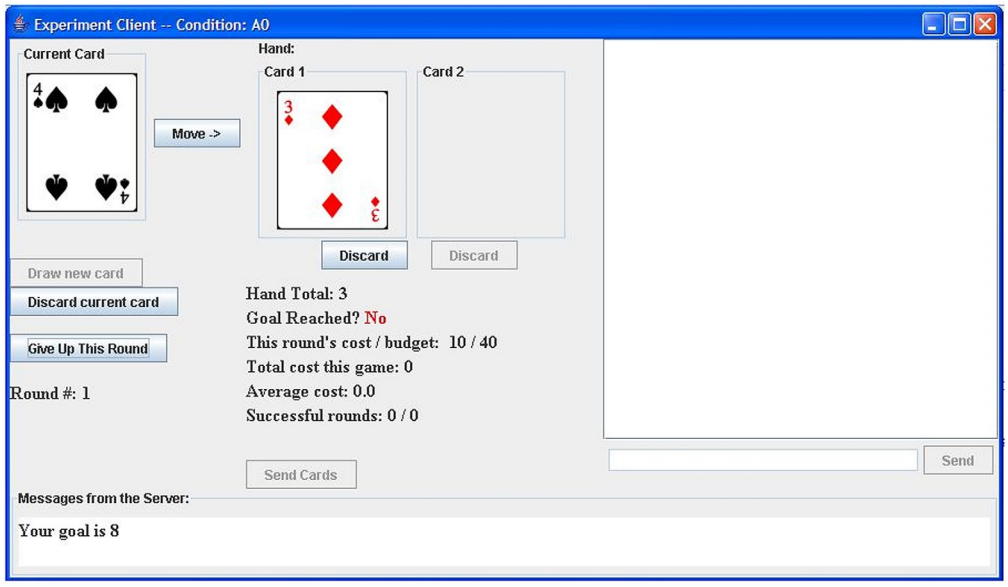

Figure 2. Screen capture of the work simulation.

3.2. Procedure

Participants were paired and assigned the roles of co-workers *A* and *B* in the computer-based work simulation described above. Sessions were conducted in groups of 16 to 40 participants in a computer lab. The computer workstations were separated by Styrofoam dividers and the software was designed such that participants who sat next to each other would not be paired. Participants were given training for the simulation: a 10-min screencast explaining the experiment and an example walkthrough. Participants completed six control questions to ensure they understood the instructions. Both roles (*A* and *B*) received the same information, and there was no deception or asymmetry in the knowledge about the experiment. The simulation ran for 20 rounds. Participants were given a guaranteed course credit and the opportunity to win a performance-based cash prize (used for the reward manipulation, described below). Dyad-level task feedback was given in a pop-up window that notified the dyad whether the receiver had successfully completed that round.

3.2.1. Manipulation: Symmetry of dependence

Symmetry of task dependence was created by manipulating whether the roles were reversed from one round to the next. In symmetric (i.e. reciprocal; Thompson, 1967) task dependence conditions, in Round 1 worker "*A*" sent cards to worker "*B*," which *B* depended on to reach *B*'s goal. In Round 2, the sequence would reverse: worker *B* sent cards to worker *A*, which *A* depended on to reach *A*'s goal. In Round 3, the sequence would reverse again, and so forth for 20 rounds. The resource controllers (card senders) knew that they would be dependent on their colleague in the next round. In asymmetric (i.e. sequential; Thompson, 1967) task dependence conditions, worker *A* would always send cards to worker *B*. Resource controllers knew that they would never be dependent on their colleague.

3.2.2. Manipulation: Reward interdependence

Reward interdependence was created by manipulating how *A* and *B* were rewarded for successfully completing a round of work. In both conditions, participants were measured and rewarded based on how many cards they personally drew, and whether they personally reached their task. Drawing one card had a cost of $1, and each had a budget of $40. The eight Role *A*s and the eight *B*s with the lowest average cost after 20 rounds would win one of 16 $20 prizes.

The *individual rewards* condition did not change this basic reward structure; participants were measured only on the number of cards they personally drew. The *group rewards* condition altered the reward structure: if the resource controller's colleague failed to reach the personal goal, and thus the group failed to reach their goal (see Figure 1), a penalty of $15 would be added to both participants' costs for that round. Thus, the group rewards condition was designed to connect the resource controller's reward to the performance of his or her colleague.

3.2.3. Outcome measure: Helpful behaviors

Helpful behaviors were measured by the amount of extra voluntary work done by the resource controller, which directly helped the dependent complete a task (Settoon & Mossholder, 2002). The participants knew, through the training screencast and control questions, that drawing more cards would be helpful by making it easier for the dependent to reach the goal. For example, suppose the resource controller reached the goal after 9 draws, but drew 7 more cards to reach a hand worth 11, they would have performed 7 helpful behaviors at a personal cost of $7. Regardless of condition, in each round helpful behaviors could only be performed by one member of the group: the resource controller (the sender of cards). Helpful behaviors were aggregated to create a single dependent variable for each dyad: the number of helping behaviors within that dyad over 20 rounds.

The simulation was designed such that the dependent needed the resource controller to draw two extra cards to reach the dependent's goal. Thus, for the group to have successful rounds (and to avoid the group rewards condition penalty for a failed round), the resource controller needed to draw 40 extra cards over the 20 simulation rounds. Therefore, in the group rewards condition, more than 40 extra cards drawn would indicate helping behavior above and beyond those required for rational behavior (avoiding the failed round penalty). In the individual rewards condition, there was no personal penalty for not drawing extra cards, and thus any extra cards drawn would indicate above and beyond helping behavior.

3.2.4. Control questions

To ensure that the participants fully understood their symmetry and reward condition, participants answered six control questions after the training (e.g. Bottom, Holloway, Miller, Mislin, & Whitford, 2006). The questions had a correct answer based on the participant's condition, and a lab assistant was notified when a question was answered incorrectly. A sample question was, "Suppose you drew 20 cards for a cost of $20, but then your partner failed the round. What would your total cost be for that round?"

4. Results

The results of each of the four symmetry × reward conditions are reported in Table 1. A two-way ANOVA indicated a significant main effect of symmetry on number of helpful behaviors, $F(1, 85) = 5.08$, $p = 0.027$, $\omega^2 = 0.04$ (see Table 2). Supporting Hypothesis 1, this indicates that participants in the asymmetric dependence conditions helped less ($M = 74.23$, $SD = 66.10$) than those in the symmetric dependence conditions ($M = 108.78$, $SD = 83.51$) (illustrated in Figure 3(a)). There was also a significant main effect of reward interdependence on number of helpful behaviors, $F(1, 85) = 7.39$, $p = 0.008$, $\omega^2 = 0.06$. Supporting Hypothesis 2, this indicates that participants in the group reward conditions helped more ($M = 112.73$, $SD = 76.56$) than those in the individual rewards conditions ($M = 71.13$, $SD = 72.40$) (illustrated in Figure 3(b)).

Table 1. Number of helpful behaviors over 20 rounds of the work simulation, by manipulation: symmetric vs. asymmetric dependence and individual vs. group rewards

	Individual rewards		Group rewards	
	Symmetric	**Asymmetric**	**Symmetric**	**Asymmetric**
Mean (SD)	93.22 (79.64)	48.05 (56.99)	125.05 (86.16)	100.41 (65.28)
No. of groups	23	22	22	22

Table 2. Two-way analysis of variance, dependent variable: helpful behaviors

Source of variation	*df*	MS	*F*	*p*	η^2
Intercept	1	747,777	140.28	0.000	0.13
Symmetry of dependence	1	27,097	5.08	0.027	0.06
Reward interdependence	1	39,414	7.39	0.008	0.08
Symmetry × Reward	1	2,345	0.44	0.509	0.01
Error	85	5,331			
Corrected total	88	5,923			

Notes: $n = 89$ groups. $R^2 = 0.131$.

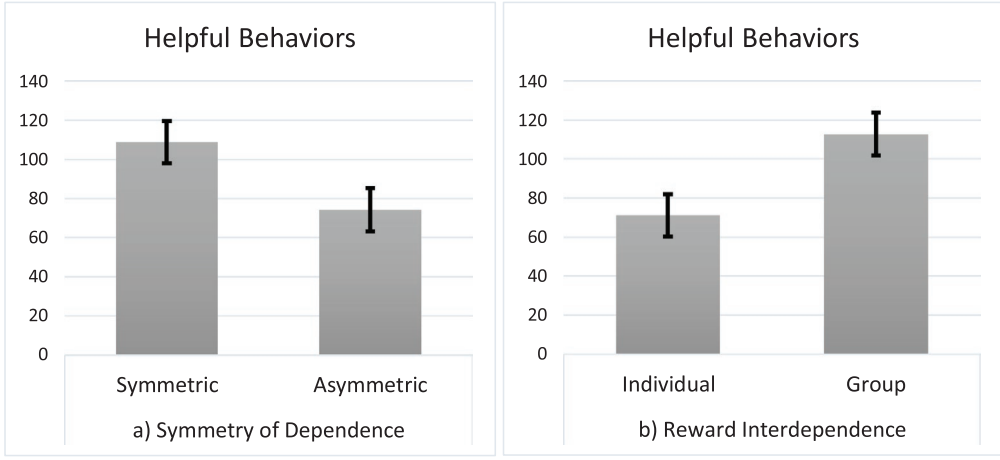

Figure 3. Number of helpful behaviors over 20 rounds of the work simulation, comparing: (a) symmetric to asymmetric dependence across all conditions; (b) individual to group rewards across all conditions.

Note: Error bars represent one standard error.

Table 3. Simple effects analysis of reward interdependence manipulation (individual vs. group rewards) within symmetry of dependence conditions

Source of variation	*df*	MS	*F*	*p*
Reward interdependence				
WITHIN symmetric dependence	1	10,851	1.94	0.167
WITHIN asymmetric dependence	1	30,161	5.40	0.022
Model	2	20,506	3.67	0.029
Within cells + residual error	86	5,584		
Corrected total	88	5,923		

Notes: $n = 89$ groups. $R^2 = 0.079$.

Hypothesis 2 also proposed that the effects of group rewards would be particularly strong in asymmetric conditions. To test this, we performed a simple effects analysis of reward interdependence within each level of task dependency (see Table 3). The analysis indicated a significant effect of the group rewards within asymmetric dependence, $F(1, 86) = 5.40$, $p = 0.022$, but an insignificant effect within symmetric dependence, $F(1, 86) = 1.94$, $p = 0.167$. To investigate this effect, we used SPSS 23 to create bias-corrected accelerated (BCa) confidence intervals based on 10,000 bootstrap samples. Within the asymmetric dependence conditions, the mean number of helpful behaviors with individual rewards was $M = 48.05$, 95% CI = [26.80, 71.31] and with group rewards was $M = 100.41$, 95% CI = [72.50, 128.26]. Within the symmetric dependence conditions, helpful behaviors with individual rewards was $M = 93.22$, 95% CI = [62.68, 126.13] and with group rewards was $M = 125.05$, 95% CI = [90.86, 161.48]. The intervals indicate that group rewards were particularly strong in situations of asymmetric dependence, which further supports Hypothesis 2.

5. Discussion

This paper investigated whether group-level rewards can counteract the negative effects of asymmetric task dependence. The results indicate that resource controllers in an asymmetric dependence are indeed motivated towards selfishness, when compared to resource controllers in a symmetric dependence. However, introducing group rewards was effective in motivating helping behavior toward the asymmetric resource controller's dependent. Our results help address an unanswered question in the organizational literature: since asymmetry is common, and it is difficult to make structural changes to reduce it, can group-level rewards be used to mitigate some of the negative effects of asymmetry? This experiment provided evidence in support of using group-level rewards (reward interdependence) to promote helping behavior in teams. This effect held even when helping was personally costly for the resource controller.

Specifically, the group rewards motivated more helpful behavior than would be rationally self-interested. We found that asymmetric resource controllers helped a small amount, drawing between 27 and 71 (BCa 95% CI) total extra cards for their dependent (or between 1.4 and 3.5 cards per round). When given a group-level reward, asymmetric resource controllers helped significantly more, drawing between 73 and 128 (BCa 95% CI) total extra cards (or between 3.7 and 6.4 cards per round). This is interesting and non-rational behavior, since the resource controllers knew that their dependent needed only 2 extra cards per round to reach their goal (and thereby avoid the group-level penalty). That is, considering each extra card cost the resource controller an extra $1, those additional 1.7 to 4.4 cards per round can be considered irrationally helpful. The group rewards appeared to motivate helping behavior above and beyond what was required for group success. In summary, the group-level rewards had an especially strong motivating effect on resource controllers in asymmetric conditions.

5.1. Contributions

This paper makes three contributions to research on asymmetric dependence and interpersonal helping. First, previous research has argued that asymmetric dependence is theoretically similar to concepts of power, and as a result, resource controllers are likely to be more motivated towards selfish behavior than helping behavior (Bowler & Brass, 2006; de Jong et al., 2007; Van der Vegt et al., 2010). Our results provide initial experimental support for this view, which helps extend these previous correlational field studies. While these prior organizational studies have had the benefit of ecological validity, they have yet to manipulate symmetry of dependence directly, and thus have not been able to suggest that asymmetry directly motivates lower levels of helping behaviors. In this study, we used a work simulation to manipulate the symmetry of dependence through the structure of the task itself, rather than relying on framing or instructions. Because of the randomized experiment and simple manipulation of symmetry, the results provide evidence that asymmetric dependence may directly motivate selfish behavior resulting in lower levels of helping behavior.

Second, this paper helps fill an important need for research into the effects of reward interdependence in situations of asymmetry. Prior research has established that when teams are *symmetrically* dependent, rewards interdependence tends to increase team performance (Johnson & Johnson, 1989; Wageman, 1995), and possibly helping behavior (Comeau & Griffith, 2005). However, there is little research investigating whether group rewards would have a similar effect when the teams are *asymmetrically* dependent. After suggesting that group rewards might mitigate the negative effects of asymmetric dependence, de Jong et al. (2007) argued, "future research is needed to establish whether such an intervention [group rewards] would actually have the desired effects." In this paper, we have helped answer this call. These are the first experimental findings we are aware of that demonstrate group-level rewards independently motivate helping behavior in asymmetric relationships. That is, without changing the underlying task dependence that created the asymmetry in the first place, group rewards motivated participants to help their dependent. As reviewed in the discussion section above, this helping behavior went above and beyond what would be considered rationally self-interested.

The third contribution of this paper is methodological. The experimental task used here placed the participants in a task-dependent relationship, manipulated symmetry and reward dependence using the structure of the task (rather than instructions or priming), and measured helping as a behavior which had a concrete personal cost for the resource controller. This design meets recent calls that organizational research into power and dependence should use decisions with real costs and behavioral outcome measures (Sturm & Antonakis, 2015).

5.2. Limitations and future directions

First, for simplicity we only examined two levels of each of the structural manipulations (symmetry and reward interdependence). We encourage future research to consider partial asymmetry and mixed reward interdependence, which could result in interesting curvilinear relationships (e.g. Wageman, 1995). Second, we did not measure possible psychological mechanisms explaining the effect of symmetry and reward interdependence. Our theoretical arguments suggest that reward interdependence may motivate helpers through rational mechanisms (helping to help oneself; Kelley & Thibaut, 1978), as well as other-oriented mechanisms, such as reciprocity, group commitment, and cohesion (Frenkel & Sanders, 2007). We recognize this limitation and encourage future research to investigate which of these underlying mechanisms is responsible for the over and above amounts of helpful behaviors observed in the asymmetric conditions. Third, as with most experimental research, the current study has limitations due to its method. Although simple tasks are seen as a defining virtue in behavioral decision research and behavioral economics (Sturm & Antonakis, 2015), organizational scholars may desire tasks that are more complicated. Relatedly, the controlled nature of the experiment may reduce the generalizability of these results. We recommend future work in a field setting to corroborate our findings.

5.3. Practical contributions

In this experiment, *group rewards* was operationalized as a group-level penalty: if the group failed a round, then *both* group members received a $15 penalty for that failed round. Alternatively, the experiment could have offered a bonus to both group members for every successful round. In both cases, a group-level reward or penalty is a method of creating reward interdependence (Wageman, 1995; Wageman & Baker, 1997), which means the individual's personal outcome (e.g. the cost for that round) depends in some way on the group's performance (success or failure in that round). In contrast, *individual rewards* was operationalized as an individual-level cost ($1 per card drawn), and this cost was not affected by the performance of the group (success or failure in that round).

Practically, managers create group-level rewards any time an individual's performance review (and therefore their raise, bonus, or promotion decision) depends on the performance of others. An individual may be judged based on the performance of the team as a whole (your team did well this quarter), the success or failure of the product they helped build (your product was completed on time and on budget), or any other factor that incorporates other employees or situational factors (your product did well in the marketplace this quarter). In all these examples, the individual's rewards (positive or negative) are tied to another's behavior (co-workers, sales, marketing, etc.). The individual understands that the rewards are contingent on another's performance. We then examined the question: Could group rewards motivate helping behavior, even in an asymmetric task relationship?

Our results confirm that resource controllers act more selfishly in asymmetric task relationships. These results are a problem for modern workplaces, because knowledge work involves natural imbalances in information, skills, tenure, or the distribution of work. One possible fix would be to eliminate these structural imbalances at the source. However, it may be difficult to change how work is divided, or redistribute the skills, knowledge, and abilities. Instead, it would be more feasible to use reward interdependence to encourage the desired behavioral change. Our results suggest that adding group-level rewards are one way to motivate asymmetric resource controllers to go above and beyond their role requirements (and self-interest) to help their dependent colleague. For example, managers could introduce an item or two to the resource controller's performance review:

performance of the team, or performance of the dependent co-worker. Adding group-level rewards may be a useful solution in organizations where shifting towards a more symmetric task structure would be prohibitively difficult.

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