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## Asymmetry in task dependence among team members

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*Document Version*

Publisher's PDF, also known as Version of record

*Publication date:*

2008

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Jong, S. B. (2008). *Asymmetry in task dependence among team members*. University of Groningen, SOM research school.

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# CHAPTER 2

## THE RELATIONSHIPS AMONG ASYMMETRY IN TASK DEPENDENCE, PERCEIVED HELPING BEHAVIOR, AND TRUST<sup>3</sup>

Work teams consist of members who are at least moderately dependent upon each other because they are required to work together and/or to rely on each other to reach their goals (Hackman, 1987). For this reason, building and maintaining interpersonal trust is argued to be of crucial importance for the effective functioning of work teams (Dirks, 2000; Rousseau, Sitkin, Burt, & Camerer, 1998). This contention is supported by empirical research which shows that interpersonal trust among work team members indirectly increases team performance by improving the motivation to work together (Dirks, 1999; Larson & LaFasto, 1989), and also by removing the emotional and interpersonal obstacles to effective team functioning. This enables team members to “devote a greater proportion of their energies toward actual task work” (Hackman & Morris, 1975: p. 48).

Several antecedents of interpersonal trust in team contexts have been identified, such as communication (e.g., Butler & Cantrell, 1994), leadership (e.g., Podsakoff, MacKenzie, Moorman, & Fetter, 1990), procedural justice (e.g., Kosgaard, Schweiger, & Sapienza, 1995), and reward structures (e.g., Ferrin & Dirks, 2003). However, very little is known about how a team member’s reliance on others for materials, information, and other resources to complete his or her job (i.e. his or her task dependence) is related to interpersonal trust within teams. This is surprising since task dependence is generally considered to be an important defining characteristic of work teams (Ilgen, 1999), and has been mentioned as a core requirement for the

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<sup>3</sup> This Chapter is based upon De Jong, Van der Vegt, Molleman (2007).

development of trust (Rousseau et al., 1998). The few studies that have been conducted (e.g., Alge, Wiethoff, & Klein, 2003) have focused on situations in which team members were considered to be equally task dependent on each other, and overlooked the possibility that asymmetries in task dependence among members may exist that could affect their attitudes and behavior (Kelley & Thibaut, 1978). Moreover, research has so far not examined the interpersonal processes that mediate the relationship between work team members' patterns of task dependence and trust. As a consequence, we know very little about how team members working within various configurations of task dependence develop a conviction that fellow team members can (or cannot) be trusted.

This study aims to contribute to existing research on task dependence and trust by examining how different patterns of task dependence are related to interpersonal trust. Moreover, we examine the extent to which a team member's trust in another team member depends on the perceived receipt of help (i.e., on how cooperative the other team member appears to be). Drawing from theories of impression formation and social judgment (Fiske, 1993; Georgesen & Harris, 1998) and of power and dependence in social relationships (e.g., Emerson, 1962; Thibaut & Kelley, 1959; Rusbult & Van Lange, 2003; Wageman 1995; Van der Vegt et al., 2005), we develop a model that describes the relationship among various patterns of task dependence, perceived receipt of help, and trust. We then test the hypotheses derived from this model by analyzing 132 social relationships among 60 bank employees and engineers distributed across 29 teams.

## **THEORY AND HYPOTHESES**

### **Definitions and levels of analysis**

We start with the basic assumption that each member of a work team is necessarily, at least to some extent, task dependent on some of the other team members (Ilgen, 1999). Task dependence exists when a team member (A) needs information, resources, advice, knowledge, physical assistance, and/or equipment from another team member (B) to complete his or her task successfully (e.g., Cummings, 1978; Van der Vegt et al., 2005). In a similar way, B may be more or less task dependent on A. When A and B are equally task dependent on each other they are said to be symmetrically or mutually task dependent (cf. Casciaro & Piskorski, 2005; pp. 170-171). When A's task dependence on B is greater or less than B's task dependence on A these two individuals are said to be asymmetrically task dependent. Such asymmetry may result from the structure of the task or from differences in the resources controlled by group members due to different roles or natural endowments

(e.g., intelligence, charisma; cf. Ragins & Sundstrom, 1989). For example, a ‘newcomer’ is likely to depend more heavily on the knowledge and experience of an ‘old-timer’ than vice versa. As we elaborate below, such asymmetries in task dependence may have important consequences for the interpersonal relationships within work teams.

Existing research has mostly focused on the effects of symmetrical task dependence, usually labeled as task interdependence. This symmetrical task dependence has generally been conceptualized and measured at either the team or the individual level of analysis. At the team level of analysis, the focus has been on differences between teams in the extent of their symmetrical task dependence (e.g., Johnson & Johnson, 1989; Saavedra et al., 1993; Wageman, 1995), whereas at the individual level of analysis the focus has been on the extent to which a specific individual team member is symmetrically task dependent on the other members of the team (e.g., Van der Vegt, Van de Vliert, & Oosterhof, 2003; Van der Vegt et al., 2005). Not only do these conceptualizations ignore the possibility that team members may differ in their dependence on each other, which results in asymmetrical task dependence, they also fail to capture the possibility that a team member may depend more on some team members than on others. That is, both team level and individual level conceptualizations of symmetrical task dependence ignore potentially important variance at the interpersonal or dyadic level of analysis. In extending previous research, we therefore not only examine the possibility that task dependence can be more or less symmetrical, but also that this task dependence can differ across the relationships that one team member has with other team members.

We assume that, over the course of an extended interaction, task-dependent team members will inevitably confront situations in which their own personal interests are pitted against the interests of one or more of the other team members (Wieselquist, Rusbult, Foster, & Agnew, 1999). Following Holmes and Rempel (1989), we argue that in such situations the trust of a team member (A) in another team member (B) is determined by A’s perception of B’s behavior. In line with attribution theory (e.g., Heider, 1958) and earlier research (e.g., Ferrin, Dirks, & Shah, 2006; Korsgaard et al., 2002), we propose that in such situations especially behavior that is perceived to be performed voluntarily, rather than formally required, will be considered as an indicator of B’s trustworthiness. In this study, we therefore focus on the role of a specific type of extra-role behavior, namely the extent to which A perceives that he/she receives help from B. We define perceived receipt of help as the perception by a team member that another team member has voluntarily assisted him or her with work-related tasks or with personal problems (cf. Settoon & Mossholder, 2002). In the workplace, such behaviors

are generally not included in job descriptions regarding task dependencies between team members, nor can they be planned for or anticipated in advance (Organ, 1990).

We define A's trust in B as A's expectation that B can be relied upon to behave in a benevolent manner (Sorrentino, Holmes, Hanna, & Sharpe, 1995). Thus, whereas perceived receipt of help refers to how another team member has behaved in the past, trust reflects the expectations about this team member's integrity and dependability in the future. As with task dependence, trust has mostly been examined, in the organizational sciences, at either the team or the individual level of analysis. At the team level, researchers have investigated the direct and indirect relationships between trust and team performance (e.g., Dirks, 1999, 2000; Williams, 2001), whereas at the individual level of analysis much of the theory and research has viewed this phenomenon as a disposition - a relatively enduring personal attribute that is assumed to yield considerable stability in cognition, affect, and behavior across a variety of situations and interacting partners (e.g., Rotter, 1980; Van Dyne, VandeWalle, Kostova, Latham, & Cummings, 2000). For the purposes of the present paper, however, we view trust as a quality that is specific to a particular relationship with a fellow team member (cf. Holmes & Rempel, 1989). With the core constructs of our research model (see Figure 2.1), and the level at which they will be examined, now specified, we can proceed to an examination of the theoretical relationships we expect to observe among these constructs.

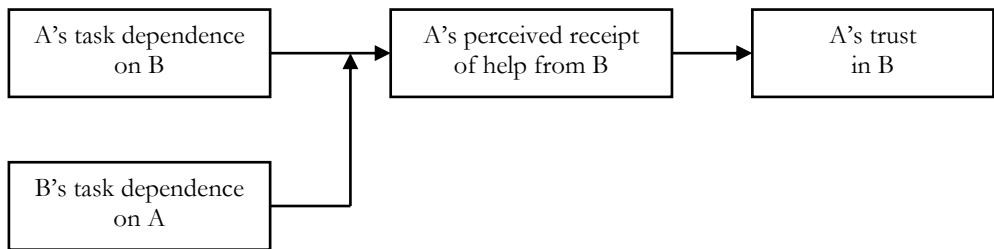


Figure 2.1: Theoretical Model

### Asymmetrical task dependence and the perceived receipt of help

Although several studies in the literature on personal relationships (e.g., Rusbult & Van Lange, 2003) and supply chains (e.g., Kumar, Scheer, & Steenkamp, 1995) have acknowledged the importance of considering asymmetries in task dependence, to date, no empirical study has examined the relationship between asymmetry in task dependence and the receipt of help. The studies that have been carried out have all examined the relationship

between symmetrical task dependence and the extent to which team members help each other (e.g., Anderson & Williams, 1996). These studies suggest that, in general, higher levels of task interdependence result in greater interaction between team members (e.g., Brass & Burkhardt, 1993) which, in turn, makes the team members more aware of each other's needs and provides them with more opportunities to help each other (e.g., Anderson & Williams, 1996). Greater task interdependence may also lead to a more intense 'liking' of other team members simply as a result of the 'exposure effect' (e.g., Bornstein, 1989), and tends to increase feelings of responsibility for one another's job performance (Kiggundu, 1983; Pearce & Gregersen, 1991). These feelings of liking and responsibility, in turn, have been shown to result in higher levels of interpersonal help (Krebs, 1970; Schwartz & Howard, 1982). On the basis of these studies, it can be expected that higher levels of symmetrical task dependence will be associated with higher levels of helping behavior.

However, as we have argued above, not all intra-team relationships can be characterized by symmetrical task dependence: One team member may be more task dependent on another than vice versa. Interdependence theory (Kelley & Thibault, 1978; Thibault & Kelley, 1959) suggests that such asymmetry in task dependence between two actors will have a significant influence on the nature of their relationship. The reason is that asymmetries in task dependence are associated with differences in power between the members of the dyad. For instance, Rusbult and Van Lange (2003, p. 335) observed that "the concepts of dependence and power are inextricably related, in that to the extent that *one person (A)* is relatively more dependent, *the other (B)* is relatively more powerful" (italics added). Based on this, we will develop hypotheses about the relationship between A's task dependence on B and A's perceived receipt of help from B with both low and high levels of B's task dependence on A.<sup>4</sup>

When B's task dependence on A is low, a low level of A's task dependence on B reflects a situation in which both team members are task independent and equally powerful. Although these team members do not really need each other's input to perform their tasks effectively, they may nevertheless choose to voluntarily help each other (Ferrin et al., 2006). Especially in work team settings, they may become aware of the needs of

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<sup>4</sup> Casciaro and Piskorski (2005; p. 170) recently investigated interorganizational power and argued that "power imbalance captures the difference in the power of each actor over the other. Formally, this construct can be defined as the difference between two actors' dependencies". Although this difference score approach is a compelling way of thinking about the above processes, we chose to adopt a regression approach, in which the components and their interaction are used, to circumvent problems associated with the use of difference scores in team research (cf. Edwards, 2001).

another member and decide to assist in performing a work task, fill in when the other is absent, or provide innovative suggestions to optimize another's work performance. However, these individuals are only likely to help if the other reciprocates (Rusbult & Van Lange, 2003). If a team member does not offer help in return, this behavior may be penalized by choosing not to help in the future. As a result of this equality in power, we expect team members to offer at least moderate amounts of help and predict that this help will also be perceived of as such.

When B's task dependence on A is low, increasing levels of A's task dependence on B result in A having an increased power disadvantage. The problem this asymmetry in power creates is that the more powerful partner may choose to withhold support and can also exit the relationship more easily and at a lower cost than the less powerful team member (Cook & Emerson, 1978; Giebels et al., 2000). In such a situation, the more powerful team member may feel little need to invest in the relationship, which makes it less likely that he or she will voluntarily help the less powerful person. Moreover, because increasing asymmetrical task dependence tends to activate increased situation and person-relevant attention (Fiske, 1993), individuals in the less powerful position are also likely to accurately perceive the help they receive as limited.

When B's task dependence on A is high, the situation is very different. In such circumstances, the low task dependence of A represents a power advantage for A over B. We noted above that power disadvantages tend to focus the attention of the less powerful on the behavior of the more powerful. The reverse has been shown to be the case for the more powerful team members. Research has shown that A's low task dependence diminishes his or her need to devote cognitive effort to observing and interpreting the behavior of the dependent other (e.g., Depret & Fiske, 1999; Fiske, Harris, & Cuddy, 2004). As Fiske (1993, p. 621) noted "people in power ... do not need to pay attention, ... and they may not be personally motivated to pay attention". Thus, even when the more task dependent team member tries to signal trustworthiness to the more powerful team member by helping him or her, it is not certain that the powerful team member will recognize this extra-role behavior, and this will result in low levels of perceived receipt of help by the powerful team member. These perceptions may be inaccurate, but "this potential inaccuracy does not make the perception any less real to the employee or any less relevant as a basis for the employee's understanding and functioning within the organization" (Ferrin et al., 2006: p. 871).

If B's task dependence on A is high and A's task dependence on B increases, the relationship between A and B becomes more symmetrical and more task interdependent, which reduces their power difference and gives

both parties opportunities to control each other's behavior. The negative effects of asymmetrical task dependence on both attention and vulnerability diminish, and the relationship is characterized by increased voluntary interpersonal help, a placid and positive emotional experience, reduced use of threats or coercion, and greater stability and congeniality (Rusbult & Van Lange, 2003). As our brief review of previous research on the effects of task interdependence suggested, this is known to result in relatively high levels of perceived interpersonal help. This reasoning leads us to expect the following:

Hypothesis 1: B's task dependence on A will moderate the relationship between A's task dependence on B and A's perceived receipt of help from B: This relationship will be negative when B's task dependence on A is low and positive when B's task dependence on A is high.

### **Perceived receipt of help as a basis for trust**

An individual's trust in another person is generally considered to be based upon his or her expectations concerning the intentions or behavior of that other person (Ferrin & Dirks, 2003; Mayer, Davis, & Schoorman, 1995; Rousseau et al., 1998). This is especially true when task dependent members of work teams encounter dilemmas involving conflict in interactions or incompatible preferences (Wieselquist et al., 1999). Holmes and Rempel (1989) labeled these as "diagnostic situations" because, in such situations, fellow team members' behavior can be considered to be indicative of their broader goals, values, and motives. When a team member foregoes immediate self-interest, this person is "signaling" a positive orientation towards the relationship, and this increases that person's perceived trustworthiness.

In work team settings, team members may signal their positive orientation in a relationship by their extra-role behavior. That is, team members can convincingly demonstrate their reliability and honesty, and hence their trustworthiness, to other team members by voluntarily helping them (Ferrin et al., 2006). Behaviors such as taking on extra responsibilities in order to help another team member or taking time to listen to a co-worker's problems and worries, demonstrate one's willingness to behave toward another in a generous and giving manner and to consider their interests and welfare. This will, in turn, result in increased trust in the helpful person's future behavior. This reasoning suggests a positive association between A's perceived receipt of help from B and A's trust in B. Combining this logic with our expectation that the relationship between A's task dependence on B and A's perceived receipt of help will be moderated by B's task dependence on A, we should also expect that:



Hypothesis 2: B's task dependence on A will moderate the relationship between A's task dependence on B and A's trust in B: The relationship will be negative when B's task dependence on A is low and positive when B's task dependence on A is high.

Hypothesis 3: A's perceived receipt of help from B will mediate the moderated relationship between A's task dependence on B and A's trust in B.

## METHOD

### Sample and procedure

In order to test our hypotheses, we contacted 29 teams in the Netherlands which amounted to 132 individuals in total. Most of the teams (90%) were from the banking sector. The others were engineering teams; two that provided information communication technology services, and one providing plant maintenance services. Specific jobs within our sample were, for instance, financial advisor, technical consultant, administrator, mortgage expert, business consultant, insurance expert, account manager, system engineer, software developer, auditor, analyst, and controller. These teams were selected because their higher management had indicated that asymmetries in task dependence between at least some of the team members were likely. For example, some employees in the banking sector frequently need information or advice (e.g., about specific clients or products) from other team members in order to sell more products. Furthermore, the length of time the team members had spent in the team and indeed in the organization varied, and this is likely to result in greater asymmetrical task dependence because more experienced members are likely to have greater insights into the (social) processes within the team or organization than newer ones.

We used two measurement methods (survey and network measures) and took measurements in two different periods when collecting our data. By measuring variables at two points in time, we minimize artifactual covariation between our study variables by temporally separating the measurement of the predictor and criterion variables (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The first measurement period (T1) was from December 2004 to February 2005. We introduced our research project to a group of managers by giving a presentation on it during a postgraduate course. Five managers indicated their interest in the project and agreed to participate in the study. These managers,

in turn, asked their subordinates whether they were willing to participate in the study. Given that the supervisors were aware of the purpose of our study their responses could be biased by this knowledge (e.g., demand characteristics). We therefore decided to only focus on the horizontal working relationships between team members.

Questionnaires were sent to all the 132 team members of the 29 teams that had agreed to participate in the study. These questionnaires contained questions related to the demographic background of the respondents and social network items assessing the extent of task dependence between the specific respondent and each of their fellow team members. A short introductory text explicitly guaranteed the confidentiality of their responses and explained that their names would only be used to link their responses in the two different research periods (T1 and T2). Of the 132 questionnaires that were distributed, 112 were returned (85%).

The second measurement period took place between February and April 2005. In this period, we approached only those respondents who had indicated their willingness to participate in a follow-up interview study. The interviews started with a short explanation of the purpose, and respondents were then encouraged to describe their organization and work team. We included this activity to obtain more background information about the teams under investigation and to help the respondents feel at ease before asking them to disclose the somewhat private information about their specific working relationships with fellow team members. At several times during the interviews, the respondents were asked to complete short questionnaires evaluating their perception of helpful behavior from, and their interpersonal trust in, specific other team members.

For those teams with five or more team members we randomly selected four members to be interviewed. Overall, 77 of the 90 individuals we tried to contact agreed to participate in the interview stage (85%). Each of these individuals answered questions about their relationships with up to three other team members ( $M=2.39$ ). We used a round robin design, so that each individual team member rated and was rated by up to three other team members. This resulted in a dataset involving 184 working relationships. Our analysis strategy required a complete set of data from both individuals in a dyad. After omitting the incomplete dyads, we ended up with 132 directed perceptions from 60 individuals. Thus, the final sample included 67% of the 90 employees we first contacted for an interview, 54% of the 112 respondents who filled in the questionnaire, and 45% of the 132 individuals making up the 29 teams.

Table 2.1: Overview of the composition of the datasets at each stage of data collection

Time	Sample size		Gender		Age		Highest education			Mean tenure (years)		
	n	% female	M	SD	% Vocational qualification or higher	% Bachelor degree or higher	Org.	Team	Position			
T1	112	53.60	37.73	9.45	79.46	38.39	11.97	3.02	4.35			
T2 (all dyads)	77	44.20	38.09	10.54	81.81	35.06	13.13	2.79	4.33			
T2 (complete dyads)	60	40.00	38.78	11.04	83.33	38.33	13.63	2.83	4.37			

Note: The sample at T1 refers to the data obtained from the questionnaires. At T2, the datasets also included data from the interviews, the two subsets contained all dyads and only the complete dyads respectively.

Table 2.1 provides an overview of the characteristics of the different samples and shows that the final paired dyadic sample at T2 was not that different to the questionnaire sample at T1 or the unpaired sample at T2. The only noteworthy difference was in the gender balance of the samples (53% of the T1 sample were women and only 40% of the paired T2 sample). For this reason, we controlled for gender in all of our analyses.

## Measures

**A's task dependence on B.** This variable was measured at T1 with a social network approach. We used a single-item based on the research of Van der Vegt et al. (2000) and adapted it to the dyadic level of analysis. For each of their fellow team members, we asked each respondent: "How dependent *are you on X* for materials, means, information, etc. in order to carry out your work adequately?" (1 = "not dependent", 7 = "fully dependent"). For each item, X was replaced by the name of a specific fellow team member. The labor-intensive character of scoring this item for all the team members precluded the use of more than one item per scale.

**B's task dependence on A.** This variable was again measured at T1 with a similar reformulated self-reporting item: "How dependent *is X on you* for materials, means, information, etc. in order to carry out his or her work adequately?" (1 = "not dependent", 7 = "fully dependent").

**A's perceived receipt of help from B.** This variable was measured during the interviews at T2 using six items adapted from Settoon and Mossholder (2002). We selected the three items from each of the task-focused and the person-focused interpersonal citizenship behavior subscales that Settoon and Mossholder had found to have the highest loadings and adapted these items to reflect the dyadic level of analysis. The selected items were; "X takes on extra responsibilities in order to help me when things get demanding at work"; "X helps me with difficult assignments, even when assistance is not directly requested"; "X assists me with heavy workloads even though it is not part of the job"; "X listens to me when I have to get something off my chest"; "X takes time to listen to my problems and worries"; and "X takes a personal interest in me" (1 = "totally disagree", 7 = "totally agree"). Before asking respondents to assess these helpfulness items, we explained that they should reflect their perceptions of X's behavior in the past. Cronbach's alpha for these six items was .87.

**A's trust in B.** This variable was also measured at T2, this time with six items adapted from McAllister (1995). As with the perceived receipt of help scale, we selected the three highest-loading items from each of the affective and cognitive trust subscales and adapted these to reflect the dyadic level of analysis. The items were: "I can freely share my ideas, feelings, and

hopes with X”; “I can talk freely to X about difficulties I am having at work”; “If I share my problems with X, I know (s)he will respond constructively”; “I can trust that X will approach his/her job with professionalism and dedication”; “I see no reason to doubt X's competence”; and “I can rely on X to not make my job more difficult by working carelessly” (1= “totally disagree”, 7=“totally agree”). We introduced the items by first stating that they pertained to how trustworthy the participants expected X to be in the future. This time, Cronbach’s alpha was .89.

**Control variables.** We controlled not only for team members’ gender but also for their age and length of team membership (i.e. team tenure) in all of our analyses, because these variables have previously been shown to be associated with interpersonal power (e.g., Carli, 1999), interdependence (e.g., Timmerman, 2000), and trust (e.g., Maddux & Brewer, 2005). These control variables were measured as part of the T1 questionnaire. As with other studies on team working (e.g., Van der Vegt et al., 2003), we also controlled for team size in our analyses.

### **Convergent and discriminant validity**

We assessed the convergent and discriminant validity of the trust and the perceived receipt of help items using confirmatory factor analysis. We computed parameter estimates using the maximum likelihood method included in the LISREL 8.51 computer package. Since A’s perceived receipt of help from B, and A’s trust in B each had two sub-dimensions (see McAllister, 1995; Settoon & Mossholder, 2002) we selected a model that contained four first-order latent constructs (i.e. the sub-dimensions) and two second-order latent constructs (i.e. A’s perceived receipt of help from B, and A’s trust in B). The fit statistics were satisfactory:  $\chi^2(49, 184) = 93.17, p < .001$ ; the standardized root mean square of the residuals (SRMSR) was .048; the goodness-of-fit index (GFI) was .92; and the comparative fit index (CFI) was .98. The factor “loading” of each item on its corresponding construct was significant at the .001 level or better.

We also computed two alternative models in order to evaluate the discriminant validity of our measurement model. The first alternative model contained only a single first-order construct. This model did not fit the data well:  $\chi^2(54, 184) = 697.14, p < .001$ ; SRMSR = .14; GFI = .61; CFI = .67, whereas our initial measurement model fitted the data significantly better ( $\Delta\chi^2[5] = 603.97, p < .001$ ). The second alternative model contained four first-order latent constructs (i.e. the sub-dimensions) but only one second-order latent construct. Although this model fitted the data reasonably well:  $\chi^2(50, 184) = 105.87, p < .001$ ; SRMSR = .061; GFI = .91; CFI = .97, the fit was worse than that of the original model ( $\Delta\chi^2[1] = 12.70, p < .001$ ). Hence, we

concluded that our original hypothesized measurement model was the most appropriate for the situation under consideration.

### **Inter-dyad agreement on task dependence measures**

Following Kenny (2004), we examined the agreement between two perceivers of the extent of task dependence using both an analysis of variance and a correlational approach. A one-way analysis of variance, using the dyad number as the predictor and task dependence as the criterion variable, was significant ( $F[131, 132] = 2.20, p < .001$ ), indicating that the variability in perceptions of task dependence between dyads was larger than the variability within dyads. Furthermore, the zero-order correlations between A's and B's perceptions of the extent to which A was task dependent on B ( $r = .37$ ) and to which B was task dependent on A ( $r = .38$ ) were positive and significant (both with a  $p < .001$ ). Taken together, these results suggest that although dyad members do differ in their perceptions of each other's task dependence, there was a substantial reality to the perceived task dependence structure that both the team members could perceive and describe.

### **Statistical analyses**

Given the specific nested structure of the data, with relationships nested within dyads, and both individuals and dyads nested within work teams, we conducted a multilevel analysis using a hierarchical linear modeling macro of the social relations model (SRM; see Snijders & Kenny, 1999, or Kenny, 1994, for more technical details). SRM analysis takes the specific nested structure of the dataset into consideration and differentiates between various levels of analysis, in our case the individual (i.e. the actor or the partner), dyadic, and team levels. Furthermore, a distinction is made between random and fixed effects. Random coefficients reflect the variance partitioning in patterns between and within groups, and fixed effects indicate the influence of the predictor variables at the group, individual, and dyadic levels.

To conduct an SRM analysis, one has to first calculate a null-model. This model does not contain any predictor variables and is used as a reference for subsequent analyses. This null-model provides an overview of how the variances in the dependent variables are partitioned (see Table 2.3): They estimate how much of the variance can be explained by characteristics of the actor (e.g., friendly people help others more often), the partner (e.g., friendly people receive more help from others), the dyad or relationship (e.g., only when both A and B are on friendly terms will they help each other), and the team (e.g., a friendly manager will induce more helpful behavior in all of his employees).

Next, in subsequent models, the predictor variables are added (see Tables 2.4 and 2.5). In Model 1, we added the control variables, and then we added the main effects (Model 2) and the two-way interaction between A's task dependence on B and B's task dependence on A (Model 3) to the hierarchical linear model. To test for the mediating role of A's perceived receipt of help from B, we controlled for this variable in Model 4 shown in Table 2.5.

We tested for a decrease in log-likelihood between each of the models in Tables 2.4 and 2.5 by means of a chi-square difference test. All the independent variables were standardized prior to the analysis to minimize the likelihood of multicollinearity problems and to facilitate comparison between the obtained coefficients. The interaction term was calculated from the product of the standardized variables (see Aiken & West, 1991).

## RESULTS

### Descriptive statistics

The means, the standard deviations, and the Pearson zero-order correlations between the variables are presented in Table 2.2. As can be seen, the zero-order correlations between length of team membership and A's trust in B ( $r=.20, p<.05$ ), and between A's task dependence on B and A's perceived receipt of help from B ( $r=.27, p<.01$ ) were both positive and significant. The zero-order correlation between B's task dependence on A, and A's perceived receipt of help from B was also positive and significant ( $r=.22, p<.05$ ). A's perceived receipt of help from B, and A's trust in B were strongly and positively related ( $r=.67, p<.001$ ). To obtain an indication of the number of asymmetrical task dependence relationships in our sample, we calculated for all A's the difference between their task dependence on B and these B's task dependence on them. This revealed that in 53% of the relationships at least one of the dyad members perceived asymmetry in task dependence in the relationship.

Table 2.2: Descriptive Statistics and Pearson Zero-Order Correlations among the Study Variables

#	Variable	M	SD	1	2	3	4	5	6	7
1	Gender	1.40	.49							
2	Age	38.78	11.04	-.41***						
3	Team tenure	2.83	5.28	-.19*	.25**					
4	Team size	4.59	4.15	.05	-.27**	-.13				
5	A's task dependence on B	4.21	1.81	-.30***	.32***	.07	-.40***			
6	B's task dependence on A	4.13	1.79	-.37***	.29***	.04	-.42***	.84***		
7	A's perceived receipt of help from B	4.71	1.22	.12	.18*	.10	-.23**	.27**	.22*	
8	A's trust in B	5.48	1.08	.02	.19*	.20*	-.10	.04	.03	.67***

Note: the correlations are calculated at the dyadic level. The Mean (M) and Standard Deviation (SD) of Gender, Age, and Team membership are calculated at the individual level. The M and SD of Team size are at the team level. With the other four variables, the M and SD are at the dyadic level.

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$



### Variance partitioning

**A's perceived receipt of help from B.** The results from the variance partitioning for A's perceived receipt of help from B is presented in Table 2.3. No significant variation was found among the teams in terms of the perceived receipt of help, which is not unusual in social relations modeling (e.g., Kenny, 1994; Kenny, Mannetti, Pierro, Livi, & Kashy, 2002; pp. 127-128). Thirty-five percent of the variance in perceived receipt of help was attributable to actor effects (A) and 15% of the variance was attributable to partner effects (B). Forty-nine percent of the variance in perceived receipt of help was due to dyadic effects. These results indicate that the specifics of the relationship between A and B have the strongest influence on the perceived receipt of help, followed by the specific characteristics of the actor and then those of the partner.

**A's trust in B.** Table 2.3 shows that the level of A's trust in B did not significantly differ across teams. Forty-four percent of the total variance in interpersonal trust was due to actor effects, and 28% of the total variance could be attributed to partner effects. The remaining 27% of the total variance in interpersonal trust was due to dyad effects. These results not only provide some support for a trait approach to trust, but also indicate that the trust of one team member in another depends, to a large extent, on the characteristics of that fellow team member and on the characteristics of the relationship.

Table 2.3: *Variance Partitioning*

Source of variance	A's perceived receipt of help from B		A's trust in B	
	Estimate	SE	Estimate	SE
Group variance	.000 (0%)	.000	.000 (0%)	.000
Actor variance	.542 (35%)	.191	.529 (44%)	.150
Partner variance	.225 (15%)	.147	.334 (28%)	.115
Dyadic variance	.740 (49%)	.185	.326 (27%)	.071
$\chi^2$		394.044		356.713

n=132

### Hypotheses tests

Hypothesis 1 predicts that B's task dependence on A will moderate the relationship between A's task dependence on B and A's perceived receipt of help from B in such a way that this relationship will be negative when B's task dependence on A is low, and positive when B's task dependence on A is high. As can be seen in Table 2.4, after adding the control variables in Model 1 and the main effects of A's and B's task dependence to the hierarchical linear model in Model 2, the third step of the analysis, as reflected in Model 3, was significant ( $\Delta\chi^2(1)=6.08, p<.05$ ). The coefficient for the interaction between A's task dependence on B and B's task dependence on A was also significant and with the expected positive sign ( $b=.295, p<.05$ ).

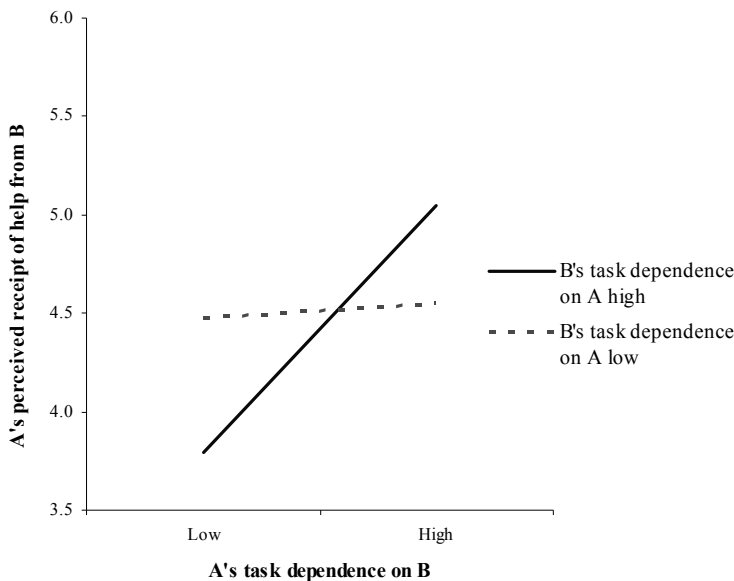


Figure 2.2: The Two-way Interaction for A's Perceived Receipt of Help from B

Figure 2.2 represents the significant two-way interaction between A's task dependence on B and B's task dependence on A, and A's perceived receipt of help. In creating the figure we followed the procedures suggested by Aiken and West (1991). This figure shows that, although the interaction coefficient was positive and significant, the pattern of results is somewhat different to what we expected. That is, it appears that A's task dependence on B was unrelated to A's perceived receipt of help when B's task dependence on A was low (simple slope:  $b=.036, t=.18, n.s.$ ), and that this relationship was strongly positive when B's task dependence on A was high (simple slope:  $b=.627, t=2.90, p<.01$ ).

Table 4: Results of SRM Analyses for A's Perceived Receipt of Help from B

Step	Variables	Model 1		Model 2		Model 3	
		Estimate	SE	Estimate	SE	Estimate	SE
Control variables	Gender of A	.268~	.141	.332*	.148	.228	.152
	Age of A	.202	.139	.174	.139	.171	.137
	Team tenure of A	.181	.152	.206	.152	.215	.150
	Gender of B	.268*	.122	.273*	.116	.265*	.115
	Age of B	.241~	.122	.255*	.117	.208~	.118
	Team tenure of B	-.010	.110	.028	.109	.038	.108
	Team size	-.139	.150	-.031	.160	-.102	.162
	$\Delta\chi^2$ (7)		11.95				
Main effects	A's task dependence on B			.301~	.175	.331~	.173
	B's task dependence on A			-.024	.185	-.047	.184
	$\Delta\chi^2$ (2)				5.32~		
2-way interaction	A's task dependence on B*					.295*	.118
	B's task dependence on A						
	$\Delta\chi^2$ (1)						6.08*

n=132

~  $p < .10$ \*  $p < .05$

Hypothesis 2 predicts that B’s task dependence on A will moderate the relationship between A’s task dependence on B and A’s trust in B in such a way that the relationship will be negative when B’s task dependence on A is low, and positive when B’s task dependence on A is high. As can be seen in Table 2.5, after we added the control variables in Model 1 and the main effects of A’s and B’s task dependence in Model 2, the third model was significant ( $\Delta\chi^2(1)=9.20, p<.01$ ) and the coefficient of the interaction between A’s task dependence on B and B’s task dependence on A was significant and with the expected positive sign ( $b=.318, p<.01$ )<sup>5</sup>.

Plotting this interaction effect and testing the simple slopes revealed a pattern of results that was similar to that obtained for A’s perceived receipt of help (see Figure 2.3): A’s trust in B was unrelated to A’s task dependence on B provided B’s task dependence on A was low ( $b=-.151, t=-.84, n.s.$ ) but positively related to A’s task dependence on B when B’s task dependence on A was high ( $b=.485, t=2.59, p<.05$ ). Thus, although the hypothesized moderating effect of B’s task dependence on A was significant, the pattern of results was again somewhat different to what we had expected.

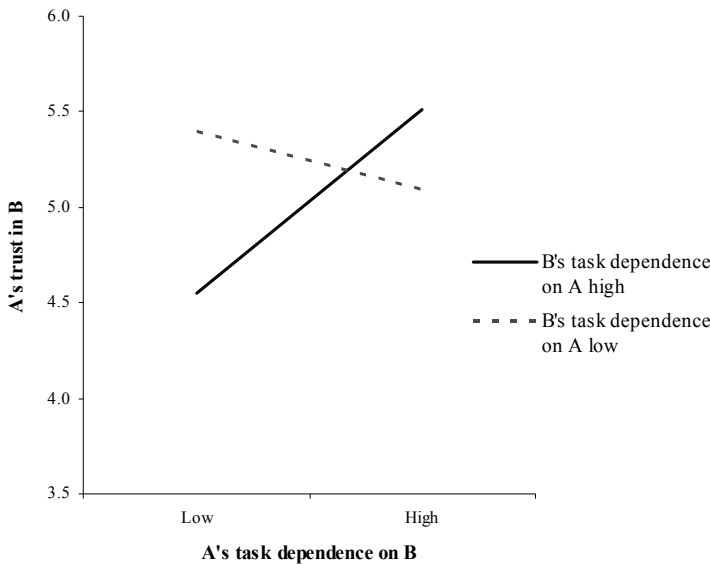


Figure 2.3: The Two-way Interaction for A's Trust in B

<sup>5</sup> The results from the interaction models were similar when we dropped the control variables from the analyses. More specifically, the results from these SRM analyses for A’s perceived receipt of help from B were  $b=.351$  ( $se=.170$ ) for A’s task dependence on B,  $b=-.043$  ( $se=.171$ ) for B’s task dependence on A, and  $b=.303$  ( $se=.109$ ) for the interaction term. The results for A’s trust in B were,  $b=.166$  ( $se=.150$ ) for A’s task dependence on B,  $b=-.102$  ( $se=.154$ ) for B’s task dependence on A, and  $b=.297$  ( $se=.094$ ) for the interaction term.

Table 2.5: Results of SRM Analyses for A's Trust in B

Step	Variables	Model 1		Model 2		Model 3		Model 4	
		Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Control variables	Gender of A	.186	.136	.185	.144	.101	.137	-.034	.102
	Age of A	.131	.136	.122	.139	.108	.129	-.008	.098
	Team tenure of A	.260~	.146	.261~	.149	.268~	.141	.172~	.108
	Gender of B	.248*	.113	.254*	.114	.251*	.111	.116	.085
	Age of B	.153	.116	.163	.117	.110	.116	-.015	.091
	Team tenure of B	.006	.106	.000	.109	.013	.105	-.001	.081
	Team size	.020	.160	.041	.167	-.036	.173	-.018	.139
	$\Delta\chi^2$ (7)		8.35						
Main effects	A's task dependence on B			.173	.156	.166	.152	-.076	.129
	B's task dependence on A			-.115	.169	-.109	.163	-.057	.134
	$\Delta\chi^2$ (2)			1.12					
2-way interaction	A's task dependence on B *					.318**	.101	.193*	.083
	B's task dependence on A								
	$\Delta\chi^2$ (1)						9.20**		
Mediation	A's perceived receipt of help from B							.628***	.075
	$\Delta\chi^2$ (1)								55.64***

n=132

~  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

As can be seen by comparing the results of Model 4 with those from Model 3 (both shown in Table 2.5), the significance of the two-way interaction between A's task dependence on B and B's task dependence on A fell when we controlled for A's perceived receipt of help (from  $b=.318, p<.01$  in Model 3 to  $b=.193, p<.05$  in model 4). The coefficient for perceived receipt of help in Model 4 was positive and significant ( $b=.628, p<.001$ ). Although the strength of the two-way interaction had decreased by almost 40 percent compared with Model 3, the interaction effect was still significant. This suggests that A's perceived receipt of help from B partially mediated the relationship between (asymmetrical) task dependence and trust<sup>6</sup>. These results, to an extent, support Hypothesis 3.

## DISCUSSION

Our SRM analyses at the dyadic level of analysis generally supported the finding from prior research that higher levels of task interdependence (i.e. symmetrical task dependence) result in more (perceived) helping (e.g., Johnson & Johnson, 1989; Van der Vegt et al., 2005; Wageman, 1995). The amount of perceived receipt of help was highest when both team members were highly task interdependent and lower when both were independent.

The pattern of results with regard to asymmetrical task dependence turned out to be more complex than expected. From insights gained from the impression formation and social judgment literature (Fiske, 1993; Georgesen & Harris, 1998), we had hypothesized that when the interaction partner was more dependent and therefore less powerful, the focal team member's task dependence would be positively related to the perceived help from and trust in the other partner, and our evidence supports this. However, in contrast to what is suggested in the power-dependence literature (Emerson, 1962; Thibaut & Kelley, 1959; Rusbult & Van Lange, 2003), we found that increased task dependence was unrelated to perceived receipt of help and trust when the other team member was more powerful. The extent of trust by the less powerful team members in our sample was apparently undiminished by the potentially greater vulnerability to possible power abuse by more powerful team members. Our third hypothesis received some support in that we found that the perceived receipt of help mediated, albeit only partially, the relationship between asymmetry in task dependence and trust. Below, we will first discuss the somewhat complex findings of the simple slopes analyses,

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<sup>6</sup> As was mentioned by one of the reviewers mean differences across the groups could have created artifactual correlations among the variables. We therefore repeated all the analyses with a dataset containing only the bank employees to examine whether team type affected our findings. The results from these analyses were similar to the results presented here.

followed by a discussion on the theoretical implications of our results, the strengths and weaknesses of our study, and some possible directions for future research. We conclude the discussion by highlighting the most important practical implications.

### **Interpretation of the simple slopes**

An initial potential explanation for the unexpected simple slope findings is that while the more-powerful team members in our sample did actually abuse their power by not providing help, the less powerful team members cognitively distorted their view of this behavior because they needed the resources and could simply not afford to be honest or balanced in assessing the other's destructive behavior. Although we cannot rule out this possibility from the data obtained in this study, it should be noted that such an explanation would be inconsistent with social judgment literature (e.g., Fiske, 1993; Georgesen & Harris, 1998) which has shown that less powerful members are usually more accurate in their assessments of the behavior of more powerful members than vice versa.

A second possible explanation is suggested by the information that was gathered during the interview phase of this study. This information revealed that many of the teams in our sample were collectively accountable for the team product. For example, many team members received bonuses based on a good collective performance. As a consequence, the more powerful members in our sample may not have abused their power simply because it was in their own interests to help the less powerful team members. This explanation is consistent with earlier research which suggested that collective rewards increase interpersonal trust (Ferrin & Dirks, 2003).

A third explanation for the absence of negative relationships between task dependence and both perceived helpfulness and trust may lie in the fact that interactions and relationships are dynamic phenomena that tend to mutate and evolve over time (Rusbult & Van Lange, 2003; Wieselquist et al., 1999). It is possible that the negative effects of power differences are more likely to occur in the early stages of a working relationship. When a powerful partner continuously abuses his or her power, the weaker team members may search for alternative sources of crucial resources (e.g., Wageman, 1995). This reasoning suggests that asymmetrical task dependence structures may become more symmetric or more cooperative over time. Given that the research participants had been part of their teams for some considerable time, it is possible that the asymmetrical relationships in our sample had become more cooperative than those found in newer relationships. As is apparent from the discussion above, a lot of work still needs to be done to fully understand the precise relationships among the various patterns of task dependence,

helpfulness, and trust; and some interesting avenues for future research are suggested below. However, we believe that while our findings do indicate a need for more research, they also offer several important insights.

### **Theoretical implications**

First, our SRM analyses revealed that substantial proportions of the variance in perceived receipt of help and trust were due to differences in the dyadic relationships among team members within work teams. The fact that our dyadic task dependence measures explained a substantial portion of the variance implies that it would be beneficial to broaden the traditional focus in the interdependence literature – which tends to be either on the individual (e.g., Pearce & Gregersen, 1991) or the team level of analysis (e.g., Liden, Wayne, & Bradway, 1997) - to include the interpersonal level of analysis. Moreover, by focusing on the interpersonal or dyadic level of analysis, we were able to observe the effects of asymmetry in task dependence on helpfulness and trust - something that cannot easily be established at higher levels of analysis.

Second, the results indicated that asymmetry in task dependence (or power) was only important when the asymmetry was in the perceiver's favor. In such cases, the dependent team member tended to be perceived as less helpful and trustworthy than was generally the case in other situations. That is, the results suggest that when person A is asymmetrically independent of person B, person B tends to be perceived as being unhelpful and untrustworthy, even when B has the opposite perception. If person A is the most independent member of a team, then he or she is unlikely to see B, a member who is more dependent on A than vice versa, as all that helpful or trustworthy. B may not share A's view of their relationship but will tend to have similar perceptions of those team members who are, in turn, relatively dependent themselves. Our results contribute to theories about power by indicating that power might be in the eye of the beholder, and that any distortions in the perceptions of the powerful (e.g., Fiske, 1993) might be more important than the actual use and abuse of power (e.g., Emerson, 1962).

Third, our results support Rousseau et al.'s (1998) contention that task dependence is important for the development of trust. Moreover, our results extend current knowledge by suggesting that a more detailed look at the relationship between task dependence and interpersonal trust might be a fruitful avenue for future research. Our finding that interpersonal trust in work partnerships can be related to positive past behaviors by the other person (Mayer et al., 1995; Rousseau et al., 1998) adds to existing knowledge (e.g., Ferrin & Dirks, 2003) by providing a deeper insight into the relatively



unknown processes of how interpersonal trust develops at the dyadic level within work teams.

Fourth, our findings add to the limited literature on the role of helpfulness in interpersonal working relationships. Mutual help among peers has been little researched (Flynn, 2003) and, as Podsakoff, MacKenzie, Paine, and Bachrach (2000) observed, the fields understanding of the task-related antecedents of helpful behavior is far from complete. The findings of our study show the usefulness of adopting an interpersonal or dyadic focus in trying to understand helpful behavior and reveal that the degree of (a)symmetrical task dependence is an important antecedent of perceived helpful behavior among team members.

### **Strengths and weaknesses**

The present study naturally has both strengths and weaknesses, and the latter may warrant some caution in interpreting the results. A possible weakness is our use of self-reporting measures, since this may introduce common source bias. However, the potential impact of any such bias should be reduced by the fact that we measured task dependence at T1 using a questionnaire and assessed trust and perceived helpful behavior at T2 during an interview. Taking measurements on two separated occasions makes it less likely that response biases (e.g., daily moods) will distort the findings (e.g., Podsakoff et al., 2003). Moreover, it would be difficult to attribute the significant two-way interactions found to common method bias. Nevertheless, future research could set out to confirm the validity of our findings by using data from different sources and by measuring all the variables at each point in time in order to provide firmer evidence for the direction of causality suggested by our findings.

Another potential weakness of the present study is the use of single-item measures for the two task dependence variables. In line with other studies involving social networks (e.g., Bowler & Brass, 2006), we opted for single-item measures because the demands on the respondents were already quite high and we wanted to investigate all the work relationships within a team. However, given the fact that our items were adopted from existing scales that have shown good reliability and validity in previous research (Van der Vegt et al., 2000), we believe that our use of single-item measures does not invalidate our conclusions. Nevertheless, future research might benefit from using several items for each variable.

Finally, our sample was fairly homogeneous in terms of backgrounds, since most of our respondents were from the banking sector. This homogeneity not only raises questions about the generalizability of our findings to other industries and settings, it might also be a factor in our

finding that group-level variations in perceived help and trust were absent (see Table 2.3). Conversely, this homogeneity in our sample could also be seen as an advantage, because it helps to rule out alternative explanations such as team and organizational climate (e.g., Parker et al., 2003).

A related issue is that we only investigated relationships among employees on a similar level to each other, and did not include supervisor-subordinate relationships in the sample. As was explained in the Method section, this was done for methodological reasons although, from an equity perspective, it might be worthwhile to include such hierarchical relationships, since it can be reasoned that the asymmetry in power between a supervisor and a subordinate is perceived to be more "normal" and "fair" than any asymmetry between "equals" (e.g., Adams, 1963). Future research could therefore investigate whether, and to what extent, the findings from this study apply to these other types of relationships.

### **Future research**

Given the paucity of empirical research into the effects of asymmetry in task dependence in work teams, many interesting avenues for future research can be identified. First, an important question that should be addressed in future research is which variables can reduce the negative effects on help and trust of asymmetry in task dependence. One promising variable to consider may be the degree of outcome interdependence in work teams (e.g., Van der Veegt & Van de Vliert, 2002). Earlier research has found that task and outcome interdependence interact in their effects on attitudinal and behavioral outcomes in such a way that positive outcomes are to be expected when the degrees of task and outcome interdependence are similar (i.e. when both are high or low; Jonhson & Johnson, 1989; Van der Veegt et al., 2005; Wageman, 1995). These studies suggest that powerful team members might be more motivated to expend cognitive effort on observing the "pro-relationship behaviors" of the less powerful when their team has a high outcome interdependence. Furthermore, using their power is perhaps more attractive to powerful team members when the outcome interdependence is low, simply because helping the more dependent team members takes time away from their own tasks and increases the performance of the less powerful team members. This might be especially the case when outcomes are divided on a competitive basis. As these suggestions illustrate, the inclusion of moderators such as outcome interdependence might help to explain when and why cognitive processes play an important role and when the active use or abuse of power becomes an important process. Additionally, future studies could also investigate whether the use of power is a process that operates independently from the cognitive processes, or whether a decline in the

motivation to pay attention to the powerless is an antecedent of increased use of power (cf. Fiske et al., 2004).

Another interesting avenue for future research might be to examine how the relationships between dyadic task dependence and a number of outcome variables are influenced by the characteristics of the relationship partner. Our results shown in Table 2.3 suggest that, at least with this sample, 15% of the variance in perceived helpfulness and 28% of the variance in trust could be explained by the characteristics of one's partner. It might be interesting and fruitful to investigate, for example, whether the relationship partner's position in the intra-team task interdependence network affects the actor's perceived helpfulness and trust. Building on this, it might be beneficial to investigate triads or larger networks of task interdependencies within work teams (cf. Casciaro & Piskorski, 2005).

In addition, we found that perceived helpfulness only partially mediated the relationship between task dependence and trust. This suggests that other variables must also influence this relationship. Future research might therefore consider the role of other mediating variables such as another's "willingness to sacrifice" and "forgiveness" (see, e.g., Wieselquist et al., 1999; Ferrin & Dirks, 2003).

Our final suggestion is that, as a further refinement to our study, one could investigate the role of the task environment (e.g., Steiner, 1972; Thompson, 1967). It seems likely that if the performance of a team reflects the performance of its most capable member, as will be the case in some problem-solving tasks (i.e. a disjunctive task; Steiner, 1972), then the types of task dependence and power will differ from the types of task dependence and power found in a team where overall performance reflects the task performance of the least capable member (i.e. a conjunctive task) as, for example, on an assembly line. Although both of the individuals described could have equal amounts of coercive power, the more capable team member is more likely to have significant expert power (Raven, 1992), and, hence, different effects on a number of outcome variables can be expected. Future research could therefore explore to what extent such differences in the task environment shape the relationship between asymmetry in task dependence and power.

### **Practical implications**

Although much work still needs to be done, the results of the present research suggest that practitioners should consider the presence and consequences of asymmetry in task dependence within their teams. Our results suggest that powerful team members do not always fully recognize helpful behavior by their more dependent colleagues and that this can lead to

a decrease in interpersonal trust. On the basis of these findings, we recommend that practitioners try to decrease the amount of asymmetry within their teams by making team members symmetrically task dependent upon each other. They could achieve this, for example, by reorganizing the work or by implementing training and mentoring programs. If it is impossible to decrease the asymmetry in task dependence, one could try to motivate the powerful to pay attention to the powerless by increasing the amount of outcome interdependence. This could also reduce the potential attraction of abusing power advantages within a team. Although such an intervention might seem logical, and is in line with findings from earlier research into interdependence (e.g., Johnson & Johnson, 1989; Van der Vegt et al., 2005; Wageman, 1995), future research is needed to establish if such an intervention would actually have the desired effects. We therefore argue that our results indicate a need for further research into asymmetry in task dependence between employees and hope that we have provided a good starting point and encouragement for undertaking such endeavors.

