In the Mind of the Beholder: Perceptual (Mis)alignment About Dyadic Knowledge Transfer in Organizations

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Introduction

Knowledge transfer is a critical element of organizational learning, and an important basis for competitive advantage, that still represents a major challenge for organizations (Argote & Ingram, 2000; Grant, 1996; Kogut & Zander, 1992; Van Wijk et al., 2008). The challenge lies in the fact that effective knowledge transfer in organizations is inherently difficult, especially when tacit or complex knowledge is concerned (Hansen, 2002; Szulanski, 1996). Although previous research has generated a better understanding of the knowledge transfer process by examining

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factors that impact its effectiveness—the level of knowledge tacitness (Nonaka, 1994; Haldin-Herrgard, 2000; Von Krogh et al., 2000), the characteristics of actors involved in the transfer (Osterloh & Frey, 2000; Tsai, 2001), the quality of the relationship between the parties (Chowdhury, 2005; Hansen, 1999; Levin & Cross, 2004), and the broader network in which the process is embedded (Reagans & McEvily, 2003)—some of the more fine-grained mechanisms remain underexplored (Van Wijk et al., 2008).

A notably absent lens for studying knowledge transfer in organizations has been the socio-cognitive approach (Ringberg & Reihlen, 2008). Indeed, despite a rich research tradition recognizing the importance of social cognition and sensemaking in organizational life (e.g., Fiske & Taylor, 1991, 2013; Weick, 2001), we know surprisingly little about perceptions of parties involved in intra-organizational knowledge transfer and the impact of these perceptions on knowledge transfer in organizations. Specifically, while previous research has examined perceptions of exchange partners about the *content* of what was being transferred (i.e., cognitive dimension of social capital needed for knowledge transfer; e.g., Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998), it has been silent about the perceptions of the occurrence of knowledge transfers *per se*. The predominant view of dyadic knowledge transfer in the literature has followed a realist ontology assuming that exchange partners are in agreement about the knowledge flow between them and thus looked at knowledge transfer as a consensual objective reality (cf. Levin & Cross, 2004; Reagans & McEvily, 2003).

In this chapter, we argue that perceptions of the existence of complex knowledge transfer between the sender and the recipient can be misaligned. We find support for this stance in the related literature on interpersonal communication (McCroskey & Richmond, 1995), where lack of consensus over whether and what was communicated has been a core phenomenon of interest, and in the literature on cognition of social networks, where the emphasis has been on exploring (in)consistencies in cognition of relational ties (Brands, 2013; Brands et al., 2015; Carley & Krackhardt, 1996; Casciaro, 1998; Kilduff & Krackhardt, 2008; Krackhardt, 1987). These literature contend that actors' perceptions of the relational ties that surround them are likely

to be biased in systematic ways.[1] Moreover, they show that individuals' cognition of the social world has important consequences (e.g., Brands & Kilduff, 2013; Smith et al., 2012). For instance, perceptions of knowledge transfer may impact the extent to which organizational members are able or willing to exchange knowledge. Identifying misalignments in perceptions of knowledge transfer experiences, and their determinants can help us to better understand and manage the effectiveness of knowledge transfer in organizations (Cannella & McFadyen, 2016; Carlile & Rebentisch, 2003).

Perceptions of Dyadic Knowledge Transfer

Although existing literature implicitly recognized the importance of perceptions for understanding knowledge transfer relations, it has not explored them directly. For example, Tsai (2001) assumed that inter-unit knowledge transfer existed only when both parties involved in the process confirmed the transfer, that is, when both the sender and the recipient of knowledge agreed on the existence of a transfer. Situations where actors had misaligned (asymmetric) perceptions of knowledge transfer had been mainly considered as a measurement error. While measurement error could have been the cause for some of these misalignments (see voluminous literature on network accuracy such as Bernard et al., 1981; Bondonio, 1998; Freeman et al., 1987; Kashy & Kenny, 1990), we contend that in the case of complex knowledge these misalignments can be meaningfully associated to a perceptual process.

The literature on interpersonal perception (Jones, 1990; Kenny, 1994) provides a useful framework to conceptually explain how perceptions of the transfer of complex knowledge may differ between the sender and the recipient. It suggests that interactions between individuals should not be considered as perfectly objective (Bernieri, 2001) since individuals' perceptual processes and subjective interpretations affect their experiences of dyadic interactions. More specifically, individual perceptions

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[1] See also the rich literature on network recall and accuracy for the point that individuals' recall of their own interactions are also systematically biased (e.g., Bernard et al., 1979, 1981, 1982; Freeman et al., 1987).

of knowledge transfer should be viewed as a *composite* form of perception because they are primarily composed of perceptions about others with whom one interacts (other-perception) and self-perceptions (Hall & Bernieri, 2001). As such, perceptions of complex knowledge transfer between A and B feature A's and B's perceptions of their knowledge sharing and knowledge receiving behaviour (self-perceptions), as well as A's and B's perceptions of knowledge receiving and knowledge sharing of their partners (other-perceptions).

Perceptions of dyadic knowledge transfer are only aligned when there is *self-other agreement* about the knowledge transfer experience between the actors involved in the transfer (Kenny, 1994). This occurs when, for example, A claims that she shared knowledge with B *and* B confirms that A shared knowledge with her (or vice-versa). Alternatively, a misalignment in perceptions is a lack of *self-other agreement* between the actors hypothetically involved in knowledge transfer(s). Hence, misalignments in perceptions of knowledge transfer refer to situations, in which A does not see her knowledge transfer behaviours (or more generally the knowledge transfer relation between her and actor B) in the same way as B does (or vice-versa).

There are two possibilities for misalignment between the actors: (1) actor A perceives that she shared knowledge with B, yet B feels that no knowledge flow occurred (Type 1 misalignment) and (2) actor A does not perceive that she shared knowledge with B, yet B feels that knowledge flow occurred (Type 2 misalignment).

The Perceptual Process of Knowledge Transfer Experiences

Perceptual process resulting in a mental representation of a dyadic knowledge transfer consists of selecting, organizing, and interpreting external stimuli related to the knowledge transfer experience with the focal partner (cf. Eysenck & Keane, 2005). In this process, not only external stimuli but also pre-existing internal cognitive structures (i.e., mental models) play an important role in making sense of knowledge transfer experiences (Johnson-Laird, 1983). These cognitive structures, which are

developed through interactions with the environment, provide the lens through which new information is filtered and represented in the mind.

The literature distinguishes between two main modes of cognitive processing (Chaiken & Trope, 1999; Evans, 2008; Ringberg & Reihlen, 2008): (1) a faster concept-driven top-down processing and (2) a slower stimulus-driven bottom-up processing. These two modes of cognitive processing differ based on the extent to which pre-existing cognitive structures influence the perceptual process. Top-down processing is dominated by one's prior organized knowledge and experience about dyadic knowledge transfer. In this mode, external stimuli about knowledge transfer experience immediately trigger activation of a relevant mental model, which then drives the perceptual process by guiding selective attention for further (mostly consistent) external cues as well as their organization and interpretation. This relatively automated mode is prevalent in familiar settings and for stimuli to which individuals are frequently exposed (Smith, 1984). The bottom-up processing mode, on the other hand, is dominated by salient external stimuli, which in turn lead to the sensemaking process. External cues in knowledge transfer experiences, which capture one's attention are organized and interpreted in a more controlled and effortful manner in order to make sense of the experience. This mode is prevalent in atypical, unexpected contexts and in situations, where individuals are in need of control (Fiske & Neuberg, 1990).

Literature on dual modes in social cognition argues that people have a preference for 'cognitive economy', meaning that the automated response is the default mode and the controlled, slower processing, mode is only possible when a person is motivated enough to exert mental effort and when her mental processing capacities are available (Payne, 2012). While both modes of processing can work in parallel, the automated intuitive mode allows for a faster and more efficient perceptual process, because the stimuli fall within and reinforce existing mental models. By contrast, the slower, effortful processing is engaged when the stimuli are salient and incongruent with existing mental models.

In the next section, we focus on the familiarity of exchange partners as a driver of their perceptual alignment. We argue that familiarity between partners triggers automated processing of knowledge exchanges,

which results in stronger cognitive alignment about these exchanges between the partners (cf. Alter & Oppenheimer, 2009). This is in line with the logic of shared mental models, which individuals likely develop with mutually familiar partners (cf. Cannon-Bowers et al., 1993; Espinosa et al., 2007). Mutually familiar partners perceive the existence of dyadic knowledge transfers through a shared mental model, which results in more aligned perceptions of their dyadic knowledge exchanges. We introduce and elaborate on three key elements of partners' mutual familiarity—reciprocal work interactions, mutual meta-knowledge, and mutual trust—to develop our argumentation for perceptual alignment.

Partners' Mutual Familiarity and Dyadic Knowledge Transfer Perceptions

Familiarity refers to having awareness, knowledge, or experience of somebody—to know a person well (Zou & Ingram, 2013). It typically results from regular and repeated associations or interactions (Zheng & Yang, 2015), even though the development of familiarity may be implicit (Alter & Oppenheimer, 2009; Jacoby et al., 1989). Familiarity with other organizational members has been related to the development of shared mental models about dyadic knowledge transfer between them (cf. Cannon-Bowers et al., 1993; Espinosa et al., 2007). That is, both partners develop a common mental model of the knowledge transfer relation that exists between them. The development of a shared mental model requires partners to be *mutually* familiar with each other. Once a shared mental model has been established, it is difficult to change and serves as a lens for making sense of knowledge transfer experiences between the partners. Shared mental models imply the existence of shared knowledge structures (Klimoski & Mohammed, 1994) and more specifically a shared mental representation of a *typical knowledge transfer* between the two partners. Therefore, two familiar actors engaged in a knowledge transfer episode have a common mental representation of a typical knowledge transfer between them that has been developed over time.

Any specific episode of knowledge transfer between familiar partners activates the shared mental model that actors have about a typical knowledge transfer with this partner and triggers an automated processing of the knowledge exchange episode (Alter & Oppenheimer, 2009). This is because in a familiar situation, shared mental models are more easily accessible in the mind of an individual and thus specific knowledge transfer experiences will primarily be checked for consistency with the existing shared mental model (including selective attention to external stimuli that *confirm* the model). Because the experience of knowledge transfer of both partners is processed through the lens of a shared mental model and triggers an automated perceptual process, their perceptions will likely fit the shared mental model. Since the mental model is shared between the partners of the exchange, individual perceptions of the dyadic knowledge transfer should also be aligned.

Familiarity is a multidimensional concept, where stronger forms of familiarity with an exchange partner are typically related to (1) more frequent interactions, (2) better knowledge about the partner, and/or (3) the development of a trust relationship (cf. Krackhardt, 1992; Zheng & Yang, 2015). Familiar individuals may have a varying degree of familiarity with these three dimensions (cf. Espinosa et al., 2007). Based on the above, we propose that higher levels of mutual familiarity, as represented in an organizational context by intense reciprocal interactions, mutual knowledge about others' knowledge skills and abilities (KSAs) or mutual trust, all lead to more alignment (less misalignment) in knowledge transfer perceptions.

Strong Reciprocal Work Interactions. Repetitive, high-intensity work interactions provide numerous opportunities for complex knowledge transfer between partners (Hansen, 1999). Frequent interactions with a particular exchange partner also contribute to the development of a stable personal mental model of exchanges with this specific partner (Rinberg & Reihlen, 2008; Rouse & Morris, 1986; Walsh, 1988). Additional knowledge exchanges that are consistent with this model make it more elaborated and robust. Moreover, frequent reciprocal interactions provide opportunities for partners to discuss their knowledge transfer interactions and thus make them more aware of potential misalignments in their models. Should there be misalignments, the frequent reciprocal

interactions will provide exchange partners with more opportunities to clear up misunderstandings and take action towards a stronger shared mental model (cf. Mathieu et al., 2000). In addition, knowledge transfer episodes with partners with whom one frequently interacts reciprocally are usually routinized and facilitate cognitive ease, which triggers automated cognitive processing, and makes corresponding dominance of shared mental model more likely. Hence, we posit:

Hypothesis 1: More frequent reciprocal work interactions between actors A and B increase (reduce) the likelihood of alignment (misalignment) in their knowledge transfer perceptions.

Mutual Meta-Knowledge. An important dimension of familiarity of exchange partners relates to an exchange partner's knowledge of other's knowledge. In organizations, this knowledge mostly refers to someone's knowledge about others' knowledge, skills, and abilities (KSAs). It is frequently referred to as meta-knowledge or knowledge of 'who knows what' and can be described as organizational members' cognitions of the expertise of others (Ren & Argote, 2011).

Meta-knowledge is essential for facilitating complex knowledge transfer and learning in organizations as it helps identify knowledge demands and sources (Bogenrieder, 2002; Nonaka, 1994). We argue that *mutual* meta-knowledge is also effective in developing shared mental models about dyadic knowledge transfer. If actors A and B are mutually aware of each other's KSAs (Lane et al., 2006), then they will have a better overview of which knowledge transfers between them are feasible and have occurred. Narrowing down the set of potential knowledge transfers between actors makes misalignments between their cognitive representations of knowledge transfers less likely. Because sharedness of personal mental models between the exchange partners also determines how they perceive specific knowledge transfer episodes, we propose:

Hypothesis 2: The more A and B know about each other's knowledge, skills and abilities, the more (less) likely the alignment (misalignment) in their knowledge transfer perceptions.

Mutual Trust. In organizations, the existence of frequent work interactions and meta-knowledge can be accompanied by a trust relationship (Chowdhury, 2005). In our conceptual framework, trust creates a potential for the strongest form of familiarity, which extends the more functional types of relations that we addressed before (work interaction and meta-knowledge) into the expressive domain (Espinosa et al., 2007). While intense interactions are important for establishing shared mental models, we argue that mutual trust between partners fosters a level of understanding that facilitates the elaboration of more robust shared mental models.

Mutual trust implies that both the source and the recipient of knowledge are willing to expose themselves to situations where they are vulnerable to the actions of the other party because they expect that the other party will not use it against them (cf. Mayer et al., 1995). This causes the trusting partners involved in a knowledge transfer to benevolently accept each other's knowledge (Levin & Cross, 2004), it involves less suspicion in interpersonal interactions, and encourages the bridging of differences in partners' views. All of these elements are essential for effective social learning, which facilitates the development and reinforcement of shared mental models (Mohammed & Dumville, 2001). Further, a mental model shared with a trustworthy partner also improves the confidence in the shared mental model, which leads to a stronger representation of knowledge exchanges that are consistent with the model. Finally, mutual trust also creates conditions where individuals feel safe and at ease, especially when in-groups are concerned (Edmondson, 1999). They are thus more likely to process new experiences in a routinized, automated way relying on existing shared mental models. Therefore, we posit:

Hypothesis 3: A mutual trust-laden relationship between actors A and B increases (decreases) the likelihood of alignment (misalignment) in their knowledge transfer perceptions.

Methods

Participants and Procedure

To explore the origins of (mis)alignments in perceptions of dyadic knowledge transfer in organizations, we use data from a knowledge-intensive firm in the ICT industry. The data were collected as a part of an in-depth sociometric survey, where all 119 employees were potential respondents. Close cooperation with the top management of the participating firm and its support for the research project were critical for successful data collection (cf. Cross & Cummings, 2004), and we obtained a final response rate of 92% (110 employees), equivalent to 767 relational ties, representing employees' perceptions of dyadic knowledge transfer. The majority of respondents in the firm were male (80%) with an average tenure of 69 months (SD = 53 months). Respondents span 4 hierarchical levels (with approximately 4.5% at the top two levels, 30% at the middle level, and 65.5% at the lowest hierarchical level) and 6 functional areas (amounting to 15, 21, 26, 7, 20, and 11% each).

The sociometric questionnaire consisted of multiple name generators and corresponding name interpreters (Marsden, 1987; McCallister & Fischer, 1978). Respondents selected names of their contacts from a roster that included all employees, without restrictions on the number of nominations, and answered questions regarding the quality and intensity of their relationships (Marsden, 1987, p. 123).

We collected employees' perceptions of both knowledge sharing as well as knowledge receiving. Hence, we obtained a complete picture of their perceptions (self- and other-perceptions) of incoming and outgoing knowledge transfer ties within a dyad for a pre-specified time period. We constructed the knowledge sharing and knowledge receiving questions based on the relational knowledge transfer literature (Cross & Sproull, 2004; Gray & Meister, 2004; Levin & Cross, 2004; Szulanski, 2000). In particular, respondents were asked to nominate co-workers who provided them with work-related advice in the six months period prior to the survey, with an emphasis that the advice inquiry reflected *transfer of*

complex knowledge transmitted by means of observation or face-to-face inter-action.[2] We specifically asked them about the following action-oriented knowledge content: (a) knowledge that contributed to customer satisfaction, (b) knowledge that created value for the company, and (c) knowledge that was useful for their personal performance improvement.[3] Each respondent was also asked to nominate co-workers, who they shared work-related advice with, representing outgoing knowledge flows. As above, employees also indicated the content of the knowledge transfer. Hence, for each pair of respondents, we gathered their perceptions about both directions of potential knowledge transfer. Our sociometric instruments produced complete social network data on two networks of perceived knowledge transfer, one representing knowledge sharing, and the other knowledge receiving. Both networks were represented as asymmetrical, binary,[4] matrices.

Additionally, we collected data work cooperation ('how frequently do you interact with X at work'), knowledge of others' KSAs (Knowledge, Skills, and Abilities) ('how well do you know KSA of X'), and interpersonal trust ('to what extent do you generally trust X'). The instruments we used for collecting this data were adapted from the knowledge transfer, social network, and social capital literatures (Cross & Sproull, 2004; Levin & Cross, 2004; Reagans & McEvily, 2003; Tsai, 2002). Finally, we obtained individuals' demographic information (i.e., gender, functional area, tenure) from company records.

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[2] We focus on complex knowledge because it is difficult to codify and the observability and traceability of its transfer between actors is not clearly observable and objectively verifiable because it usually occurs by means of face-to-face interaction or observation/imitation (Von Krogh et al., 2000). Transfers of complex knowledge are more exposed to perceptual processes of parties involved in the transfer.

[3] We empirically established high correlation among the three knowledge contents, which provided support for their aggregation.

[4] We binarized matrices above 0 in order to capture even weaker advice giving and seeking relationships and to avoid that our measure of alignment and misalignment relies on differences in the strength of the relationship.

Measures

Our dependent variables are *Alignment* and *Misalignment* in perceptions of dyadic knowledge transfer. Both variables are binary, directed, square matrices, resulting from the combination between the advice receiving and sending matrices. The *Alignment*[5] measure was computed by multiplying the transposed advice receiving matrix with the advice sending matrix. Cells in the Alignment matrix take the value of 1 if A nominated B as a complex knowledge exchange partner and B nominated A as a complex knowledge exchange partner, and 0 otherwise. The *Misalignment* measure was developed by subtracting the advice sending matrix from the transposed advice receiving matrix. Nonzero values were recoded to one to obtain the *Misalignment* measure. As such, a 1 in the misalignment matrix that A nominated B as a complex knowledge exchange partner and B did not nominate A, or that B nominated A but A did not nominate B. To distinguish between these two possibilities, we also developed measures for Type 1 and Type 2 misalignments. The *Type 1 misalignment* measure was constructed by calculating the difference between the transposed advice receiving matrix and the advice sending matrix for values *lower* than zero and the *Type 2 misalignment* measure was constructed from values *higher* than zero.

The independent variables were used to operationalize exchange partner's mutual familiarity. Consistent with our theory, mutual familiarity was operationalized with three variables: Strong reciprocal work interactions (*Reciprocal Strong Work Ties*), Mutual trust (*Mutual Trust Ties*), and Mutual meta-knowledge (*Mutual KSA Ties*). Each of these

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[5] Conceptually, misalignment and alignment are the opposite of each other. Empirically, this is more complex due to the fact that alignment in not sending and receiving knowledge has no practical relevance (especially for dyads without any work interaction); while conceptually it still represents an alignment in perceptions. Therefore, in our data we define three mutually exclusive states for each dyad: (1) the dyad has an aligned perception of knowledge transfer (covered by our Alignment outcome variable), (2) the dyad has a misaligned perception of knowledge transfer (covered by our Misalignment outcome variable), or (3) the dyad has no perception of knowledge transfer (null value in our data). Moreover, we control for work interaction in the dyad (Work Tie) in all empirical models.

variables is a matrix obtained from a single-item question that respondents had to answer using a 5-point Likert scale. Consistent with our theory, we binarized the reciprocal work tie matrix above or equal to 4 and the Mutual Trust and KSA ties matrices above 0. The *Reciprocal Strong Work Ties*, *Mutual Trust Ties*, and *Mutual KSA Ties* matrices were symmetrized using the minimum method so that we only considered reciprocal work, mutual trust, and mutual KSA ties to predict alignment and misalignments of knowledge transfer perceptions.

We included several controls in our models. To understand the impact of familiarity above and beyond the existence of a simple work relationship, we created a *Work Tie* measure. In order to compute this measure, we used the same initial matrix as for the Mutual Strong Work ties, but binarized above zero and not symmetrized. All results of our analyses should thus be considered as 'above and beyond having a work tie with a co-worker' (cf. van der Vegt et al., 2010). We controlled whether employees were in a *Different Organizational Unit*. The variable takes the value 0 if both actors in the dyad are in the same organizational unit and the value 1 otherwise. We also created variables to control for homophily along several demographic dimensions. *Gender Homophily* takes the value of one if both actors in the dyad are of the same gender and zero otherwise. *Tenure Differential* is the absolute value of the difference between the tenure of the sender and the tenure of the recipient (in months).

We also included a set of endogenous network configuration variables. The *Density* parameter can be interpreted as the extent to which ties (i.e., (mis)alignments of perceptions in dyadic knowledge transfer) tend to appear on their own or embedded with the other configurations present in the model. *Reciprocity* indicates the extent to which ties in the alignment and in the misalignment networks tend to be reciprocated. We also control for the indegree and outdegree distributions (see Bondonio, 1998) and for the tendency of alignments and misalignments to be clustered (see Quintane, 2013).

Data Analyses

We used Exponential Random Graph Models (ERGM or p^* modelling) to examine the determinants of the existence of a mis/alignment in perceptions between two actors. ERGM is a methodology designed to examine both local network microstructure and actor attributes conjointly in order to estimate the relative contribution of our variables of interest to the existence of an (alignment or misalignment) tie between each pair of actors in the network, accounting for actor attributes, as well as local and global network structure (for an introduction and review, see Robins et al., 2007).

ERGMs are based on the statistical representation of an observed network using an autologistic model. The dependent variable is the presence or absence of a relational tie between two actors (in our case presence or absence of alignment/misalignment of knowledge transfer perceptions), which is modelled as a function of effects including the local structure of the network surrounding the two actors that are involved in the tie as well as the individual attributes of the actors themselves (Lusher et al., 2013). Unlike simpler logit models, the autologistic form of ERGMs ensures that careful account is taken of dependencies of observations typical in network data (Anderson et al., 1999).

Results

Descriptive Statistics

Descriptive statistics presented in Table 1 show that there are more misalignments (519) than alignments (248) in perceptions between knowledge transfer partners. This means that in the observed company employees exhibit a considerable level of disagreement regarding the occurrence of dyadic knowledge transfer with only 32% of perceptions aligned.

Table 1 Descriptive information about the variables included in the model

Variables	Value
Alignment	248[a] (124) ties
Misalignment	519 ties
Type 1	303 ties
Type 2	216 ties
Mutual Familiarity	
Mutual KSA ties	182 ties
Mutual Trust Ties	330 ties
Strong Reciprocal Work Ties	190 ties
Controls	
Work ties	972 ties
Different Organizational Units	408 ties
Gender Homophily	Average = 0.66 (66% of dyads are same gender) Max = 1 Min = 0
Tenure Differential	Average = 61 months Max = 192 months Min = 0

[a]Comparable count is given; each aligned dyad consists of two dyads that are aligned (raw count is provided in parentheses)

Hypotheses Testing

Table 2 presents the results of two ERG models,[6] where we test hypothesized predictors of alignments and misalignments. Model 1 uses *Alignment* as a dependent variable, while *Misalignment* is used as a dependent variable in Model 2.

Our first hypothesis was that more frequent reciprocal work interactions would increase the alignment and reduce misalignment (H1) in dyadic perceptions of knowledge transfer. Our results provide no

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[6] Goodness of fit of the models is not reported but is available from the authors. The goodness of fit is assessed by simulating 1,000,000 graphs based on the model and comparing the features of 10,000 graphs selected randomly to the observed data. The features of the graphs are compared across more than 50 indices. The models presented here had very good fit for all but 3 indices that represent degree distribution. Hence, our models capture only partially the degree distribution of the networks. Because modelling completely/perfectly the degree distribution of these networks is not a main aim of this paper and it does not affect the other results (all of which have an excellent fit), we prefer to present these simpler models.

Table 2 ERG models for alignment and misalignment of knowledge transfer perceptions

Effects	Model 1—Alignment	Model 2—Misalignment
Mutual Familiarity		
Mutual Strong Work Tie	0.37 (0.34)	0.33 (0.21)
Mutual Meta-Knowledge (KSA) Tie	**1.20 (0.28)**	**0.58 (0.20)**
Mutual Trust Tie	**1.22 (0.49)**	−0.46 (0.24)
Controls		
Work Ties	**1.69 (0.44)**	**2.17 (0.16)**
Different Organizational Unit	−0.67 (0.53)	**−0.42 (0.14)**
Tenure Differential	0.00 (0.00)	−0.00 (0.00)
Gender Homophily	0.34 (0.20)	0.13 (0.07)
Density	**−6.71 (0.39)**	**−4.33 (0.45)**
Reciprocity	**1.91 (0.58)**	**0.91 (0.26)**
Two Path	**-0.31 (0.08)**	
Indegree Control	0.10 (0.21)	−0.36 (0.22)
Outdegree Control	**0.94 (0.18)**	**0.38 (0.14)**
Transitive Clustering	**1.27 (0.22)**	**0.79 (0.08)**
Cyclic Clustering	**−1.18 (0.37)**	**−0.16 (0.06)**

Standard Errors reported in parenthesis; Substantial effects (the parameter estimate equals at least twice its standard error) are indicated in bold

support for this hypothesis. In our second hypothesis, we hypothesized that having mutual knowledge about the exchange partner's KSAs would increase the likelihood of alignment in perceptions of dyadic knowledge transfer and decrease the likelihood of misalignment. The empirical test provides only partial support for this hypothesis: mutual meta-knowledge about partner's KSAs increases both the likelihood of alignment and misalignment of dyadic knowledge transfer perceptions. Our third hypothesis proposed that the existence of mutual trust between two actors would increase the likelihood of alignment and reduce the likelihood of misalignment. The empirical test shows a partial support for our hypothesis: the existence of mutual trust significantly increases the likelihood of alignment in perceptions of knowledge transfer; however, it is not significantly associated with the (lower) likelihood of misalignment of these perceptions. We note that the sign of the effect for misalignment is in the hypothesized direction (i.e., negative).

Our controls show that gender homophily and tenure differentials are not important predictors of either alignment or misalignment in perceptions of knowledge transfer. We also find that reciprocity has a significant and positive effect on the alignment and misalignment of knowledge transfer perceptions. Further, we find that belonging to different functional areas significantly reduces the likelihood of misaligned perceptions, but it does not significantly increase the likelihood of aligned perceptions. In both models we identified significant heterogeneity in the outdegree distribution (i.e., there are a few actors, who 'send' many alignments or misalignments), but not in their indegree distribution (all actors receive a relatively similar number of alignments or misalignments). These parameters suggest that individual differences might be helpful to further explain an individual's propensity to be involved in perceptual alignments or misalignments. Finally, clustering and connectivity parameters were also significant. A situation featuring positive transitive clustering and a negative cyclic clustering effects (as is the case here) is typically interpreted as a hierarchical process of group formation. This implies that alignments and misalignments of perceptions of knowledge transfer beyond the dyad might be hierarchically arranged.

Statistical Modelling of Different Misalignment Types

In additional analyses, we distinguished between two types of misalignments: Type 1 misalignment refers to the sender reporting the knowledge transfer while the recipient does not, and Type 2 misalignment refers to the recipient reporting the knowledge transfer while the sender does not.

In Table 3 we show models where we explored how mutual familiarity of exchange partners relates to Type 1 and Type 2 misalignments. In a similar way to the previous models, the likelihood of both types of misalignments is not affected by actors being involved in frequent reciprocal work interactions (H1). The different types of misalignments enable us to disentangle the effects of mutual meta-knowledge of KSA (H2) and mutual trust (H3). In the case of Type 1 misalignment, mutual meta-knowledge of KSA and mutual trust between the two partners are not significantly related to the existence of a misalignment between the

two exchange partners. By contrast, for Type 2 misalignment, mutual meta-knowledge of KSA and mutual trust between the partners are significantly and positively related to the existence of a misalignment between them.

The results of these additional analyses suggest that the two types of misalignments, which we introduced here, are affected by different patterns of predictors. While the result that mutual trust increases the Type 2 misalignments appears contradictory to our finding in Model 2, it is important to note that the focal parameter in Model 2 denotes an aggregated effect for both types of misalignments. Type 2 misalignments are also less frequent than Type 1 misalignments and they may have valence for both work relationships specifically and knowledge exchange in organizations more generally. Based on our findings we can argue that Type 1 and Type 2 misalignments are qualitatively different, with potentially different implications for knowledge processes in organizations, and

Table 3 ERG Models for two types of misalignments of knowledge transfer perceptions

Effects	Misalignment Type 1	Misalignment Type 2
Mutual familiarity		
Mutual Strong Work Tie	0.27 (0.31)	–0.18 (0.35)
Mutual Meta-Knowledge (KSA) Tie	0.31 (0.28)	**1.10 (0.33)**
Mutual Trust Tie	–0.18 (0.27)	**1.68 (0.54)**
Controls		
Work Ties	**2.72 (0.18)**	0.12 (0.46)
Different Organizational Unit	**–0.99 (0.21)**	–0.38 (0.61)
Tenure Differential	–0.00 (0.00)	0.00 (0.00)
Gender Homophily	0.20 (0.11)	0.02 (0.10)
Density	**–5.12 (0.36)**	**–6.21 (0.27)**
Reciprocity	–1.10 (0.56)	–1.27 (0.82)
Two-Paths		**–0.15 (0.03)**
Indegree Control	0.02 (0.17)	**–0.96 (0.43)**
Outdegree Control	**0.60 (0.13)**	**0.64 (0.15)**
Transitive Clustering	**0.75 (0.11)**	**0.90 (0.13)**
Cyclic Clustering	0.09 (0.14)	**1.22 (0.14)**
Transitive connectivity	**–0.12 (0.03)**	
Activity-based connectivity	**0.02 (0.01)**	

Standard Errors reported in parenthesis; Substantial effects (the parameter estimate equals at least twice its standard error) are indicated in bold

should thus be interpreted differently as we do in more detail in the next section.

Discussion

This paper rests on the premise that individuals involved in dyadic transfer of complex knowledge can be misaligned in their perception of the existence of knowledge transfer. We developed a conceptual model based on the dual model of cognitive processing to propose that mutual familiarity of partners involved in the transfer of complex knowledge leads to perceptual alignment. The empirical tests of the model highlight the role of mutual trust in fostering perceptual alignment. Beyond these straightforward findings, we also detected some more interesting patterns, which warrant a more nuanced discussion.

First, a basic descriptive analysis of our data suggests that *misalignment of knowledge transfer perceptions in dyads is a pervasive phenomenon in organizations*. More so, the ratio between perceptual misalignments and alignments in the observed company is approximately 2:1 in favour of misalignments. In other words, the respondents in our study were more often not in agreement with their partners about their perceptions of complex knowledge transfer, than they were. Although this result is surprising, similar observations can be traced back to the early literature on mental models, which reports that miscommunications are more likely in complex contexts (Rouse et al., 1992).

Second, exchange partners' mutual familiarity based on the intensity of reciprocal work interactions and mutual meta-knowledge of each other's KSAs proved to be an *ambiguous* factor of perceptual alignment. In particular, strong reciprocal interactions with exchange partner was not related to either alignment or misalignment, while mutual meta-knowledge of KSAs significantly predicted both alignment and misalignment in perceptions of complex knowledge transfer. Although mutual meta-knowledge might help individuals develop shared mental models of typical knowledge transfers with their exchange partners, they are not effective in preventing misalignments in perceptions of knowledge transfer episodes. A possible explanation for this finding may

be that intense reciprocal interactions and mutual meta-knowledge as predominately functional ties are not profound enough to develop robust shared mental models of complex dyadic knowledge transfer. Only when mutual trust, a more expressive relational tie between exchange partners is present, such mental models can be developed and activated.

Indeed, theoretical work (Healey et al., 2015) suggests that shared cognition among team members forms on two levels: the explicit (reflective) level and the implicit (reflexive) level. The main assertion is that these two levels are not necessarily aligned. Our study indicates that mutual familiarity of exchange partners, which is not based on mutual trust could indeed be related to what Healey et al. (2015) call *illusionary concordance*—a situation, where partners' cognitions are shared on the surface, while simultaneously they are not in agreement on a more profound, reflexive level. The existence of such an ambiguous situation provides an explanation for why in our study shared mental models based only on mutual meta-knowledge relate to both perceptual alignment and misalignment. Mutual trust, on the other hand, seems to facilitate robust shared mental models that make illusionary concordance less likely.

Third, additional analyses shed light on the two types of misalignment that we identified. Considering the knowledge transfer from the perspective of the sender and of the recipient enables us to propose a more substantive explanation of Type 1 and Type 2 misalignments. Type 1 misalignment is characterized by a sender who perceives to have sent knowledge while the designated recipient does not confirm receiving it. This asymmetry in perceptions is potentially negative because the sender might expect some form of acknowledgement or reciprocation from the recipient, which is unlikely to occur since the recipient has not perceived that knowledge has been transferred. This lack of acknowledgement or reciprocation might jeopardize future knowledge transfer attempts from the sender to the recipient and could cause difficulties for knowledge transfer in the organization. Our results show that Type 1 misalignments are more likely to occur when a weak work relationship exists between the sender and the recipient who are not mutually familiar, implying an absence of a shared mental model in the dyad. We also know that this type of misalignment is significantly less likely with exchange partners who are salient due to their different organizational affiliation. As such,

Type 1 misalignments, occur among colleagues who are aware of, but not necessarily familiar with each other and who are not mutually salient. Additional research is needed in order to understand better the determinants and consequences of what seems to be a prototypical misalignment in perceptions of complex knowledge transfer within a dyad.

Type 2 misalignment, on the other hand, refers to a situation, where a potential sender is not aware of sending knowledge, while the recipient confirms reception. We propose that this type of misalignment could be related to vicarious learning (cf. Bandura, 1965) and is more positive than Type 1 misalignment because it entails a potential for reciprocation (unexpected by the sender) of knowledge flow in the future. The latter could facilitate knowledge transfers between the actors in the future. Our findings suggest that Type 2 misalignment is more likely to occur between partners who are familiar with each other (i.e., having mutual meta-knowledge of other's KSA and mutual trust) but not necessarily salient, which is consistent with the concept of vicarious learning. This is also one of the plausible explanations for the apparent inconsistency between Model 2 and findings of our additional analyses. This result might also explain the ambivalent role of meta-knowledge of each other's KSA as a predictor of both alignments and misalignments. In our dataset, the ratio between Type 1 and Type 2 misalignments is approximately 2:3 in favour of Type 1.

Theoretical Contributions and Implications

First and foremost, this chapter contributes to the social network view of knowledge management. We show that, in organizational settings, complex knowledge transfer perceptions are more often misaligned than not. Perceptual misalignments are multifaceted with significant (different) implications for knowledge-based processes in organizations. An implication for studying knowledge-based processes is that researchers should pay attention not only to the dynamics of knowledge transfer or to the perceptions of the content being transferred but also to perceptions of knowledge transfers *per se*. This suggests consideration of the socio-cognitive perspective (Ringberg & Reihlen, 2008) and

more careful conceptualization and measurement of knowledge transfer constructs, possibly collecting information about the flow from both actors involved in a complex knowledge transfer.

Further, we adopt a new theoretical perspective to identify another reason for the important role trust plays in facilitating effective knowledge transfer. Above and beyond what is reported in the literature (cf. Alexopoulous & Buckley, 2013; Van Wijk et al., 2008), our study demonstrates that mutual trust between partners involved in complex knowledge transfer makes an essential contribution to the development of robust shared mental models that facilitate perceptual alignment. Based on the recent theoretical developments on shared cognition (cf. Healy et al., 2015), we suspect that trust might be facilitating concordance between reflective and reflexive levels of cognition among individuals in organizations.

Second, our work contributes to an emerging literature on asymmetries in organizational behaviour. Recently, researchers have started questioning the symmetry logic underlying well-known constructs in organizational behaviour research that addresses relational phenomena such as trust and power (De Jong & Dirks, 2012; Korsgaard et al., 2015; Van der Vegt et al., 2010). Our paper speaks to the need to openly address asymmetries by building on the premise that misalignments in knowledge transfer exist and do not have an entirely symmetrical genesis to perceptual alignments. It also offers an example of how this can be done conceptually and methodologically. By addressing perceptions of dyadic knowledge transfer we show that asymmetries exist and have meaningful implications. Moreover, by recognizing that asymmetries exist we are able to define perceptual alignment and two types of perceptual misalignment (Type 1 and Type 2). We believe this has broader implications; based on our study we can propose that after asymmetries are recognized as an essential feature of relational constructs at least three sub-constructs (i.e., general misalignment and two specific types of misalignment) can be conceptualized to offer additional insight into the explored relational phenomena.

The logic adopted in this chapter could be extended to other areas in organization research that focus on understanding dyadic relationships and their dynamics. For example, research in the Leader Member

eXchange (LMX) typically examines the exchange from the viewpoint of either leaders or followers, while misalignments in their perceptions are rarely explicitly addressed (Gerstner & Day, 1997). Examining misalignment would make it possible to explore the extent to which perceptions of the leader and/or of the followers regarding their relationships may affect the benefits that each derives from the relationship. In a similar vein, Černe et al. (2014) found that knowledge hiding can hurt one's future creativity because of the implications of violating the norm of reciprocity. The authors assumed that actors have aligned perceptions of the potential exchange (and of the hiding). Following our results, it would be valuable to distinguish between cases in which there is agreement about hiding from those, where one actor may not perceive that hiding is taking place.

Finally, our research contributes to a better understating of individual cognition of relational ties in organizations and offers additional support for claiming that cognition of relational ties matters. Recent reviews of cognitive networks (e.g., Kilduff & Brass, 2010; Taselli et al., 2015) identified cognition of relational ties as one of the key challenges of the social network research programme. This work joins a stream of research (e.g., Brands et al., 2015; Carnabuci & Diószegi, 2015; DeRue et al., 2015), which shows that mental representations of relational ties (or social structure) are relevant and can have important consequences.

Limitations and Future Research

Our results are based on the study of a single organization, which may limit their generalizability. However, we have to note that we have data for almost everybody in the complete network and a considerable amount of relations (over 700), which are essential for testing our conceptual model.

In the current study, we focussed on complex knowledge transfer because it was considered most susceptible to perceptual misalignments. However, what is being transferred and where could represent an important moderator of the examined mechanisms. Future research should thus address boundary conditions and examine how the extent of

knowledge complexity, characteristics of knowledge content, and differences between knowledge characteristics that flow within and between organizational units affect the focal mechanisms. In addition, future research could also explore how organizational context features such as the extent of performance demands, type of work setting (physical, hybrid, or remote), intensity of internal competition, and tightness of time constraints affect the potential for perceptual misalignment in organizations.

A closer inspection of some control variables (e.g., statistically significant indegrees and outdegrees) indicates that individual-level factors such as personality or motivation could play an important role in the focal mechanisms. Including specific individual constructs (e.g., self-monitoring, extraverted personality, interpersonal sensitivity) would be beyond the scope of the current study. However, we encourage future research to explicitly address the effects of most relevant individual psychological constructs such as self-monitoring (Fang et al., 2015) on perceptual alignments and misalignments.

Finally, building on our study further research could examine various relevant outcomes of alignment and misalignment of dyadic knowledge transfer perceptions in organizations. For example, at the dyadic level (mis)alignments could have an effect on future knowledge transfers in the dyad and the quality of the relationship between the partners. At the individual (partner) level, on the other hand, (mis)alignments could affect an individual's creativity, learning, preparedness to help co-workers, and performance. We suggest experimental research designs as particularly suitable for empirically examining these effects.

Implications for Practice

Differences in perceptions of dyadic knowledge transfer are not only interesting *per se* but also because misaligned perceptions of knowledge transfer may result in behavioural responses that adversely affect (other) knowledge-based processes in organizations. For example, based on her perception of knowledge transfer with other organizational members an individual could reciprocate knowledge and offer help or refrain from

doing so. In addition, we know from previous research on shared mental models that (shared) mental models can affect performance (Mathieu et al., 2000). Therefore, our research highlights the need for organizations to pay attention to the issue of misalignment of perceptions of dyadic knowledge transfer because of its prevalence and potentially negative consequences for organizations.

One activity to address this issue is having (periodical) targeted conversations about knowledge exchanges. Misalignments in knowledge transfer perceptions are namely subject to *meta-accuracy* problems. This problem refers to a situation where person A is wrong about how her knowledge transfer behaviours are seen by person B or vice-versa. In the absence of an explicit conversation about knowledge transfer experiences, individuals involved in knowledge transfer interactions usually assume that other people's perceptions of their behaviour are in line with their views. In the case of a misalignment in perceptions, actors are wrongly convinced that their view of how partners see their knowledge transfer behaviours is the same as their partner's views about their behaviour. When misalignments occur, they can frequently be unknown to the parties involved. Regular conversations about dyadic knowledge transfer (episodes), for example, as a part of retrospectives in agile work methodology, might contribute to better recognition of knowledge transfer misalignments and pave the way to their resolution before critical (negative) events that could have revealed them anyway.

Another lever to pull is systematic work on strengthening mutual trust among organizational members. We know from the work on illusionary concordance (Healey et al., 2015) that some misalignments feature a level of disagreement too profound to be addressed with only regular conversations about misalignments. Offering mediation and coaching along with general development of organizational culture that emphasizes prosocial behaviour, perspective taking and empathy can contribute to less misalignments in knowledge transfer perceptions. In addition, the development of mutual trust-laden relationships also has a positive effect on the underlying knowledge transfer process (Hansen, 1999; Levin & Cross, 2004).

Organizations experience two types of perceptual misalignment in knowledge transfer—Type 1 and Type 2. Whereas Type 1 is more

frequently observed and has a stronger potential for negative consequences, Type 2 is less frequent and potentially virtuous. For Type 1 misalignments (i.e., the sender claims knowledge transfer occurred, but the receiver does not confirm it), the above suggested targeted conversations are recommended. In addition, knowledge senders should be more careful in examining if the intended knowledge has actually been transferred in direct interaction with the targeted recipient after the (alleged) transfer. For example, the sender could prompt the receiver to reproduce in knowledge in their own words, use it in a relevant situation, and provide sufficient feedback. Type 2 misalignment (i.e., receiver confirms knowledge transfer that sender is not aware of), on the other hand, should be embraced as a means for facilitating transparency and open-learning in organizations. That said, organizations should find innovative means for recognizing the contributors to such vicarious learning, and recipients of knowledge could be encouraged to model knowledge-sending behaviour to leverage the learning effects and further enhance general reciprocity in the organization (Baker & Bulkley, 2014).

The recent acceleration in remote and hybrid work puts another perspective on misalignments of knowledge transfer perceptions for the future. In our study we have primarily addressed complex knowledge, that is 'transmitted by means of observation or face-to-face interaction'. The pandemic work experience in many organizations at least limited if not completely prevented physical observation and face-to-face interaction. Although we can expect that many aspects of face-to-face interaction will return in the future hybrid work experience, knowledge transfer has changed. Poorer channel bandwidth of synchronous electronic communication (and not being embedded in the same physical context) could result in more Type 1 misalignment. The lack of salience of knowledge exchange partners, facilitated by the shift to more in-silo interactions (see Yang et al., 2022) could further enhance this development. Alternatively, spontaneous observations in a shared physical setting and thus Type 2 misalignments will be less likely. This will probably shift the Type 1/Type 2 ratio further in favour of (more negative) Type 1 misalignments. Mutual trust, as a key lever for reducing misalignments,

will be developed differently and a more superficial type of trust, the so-called swift trust, might play a much bigger role in the future (Neely, 2021). In organizations, this development calls for increased vigilance and attention to knowledge transfer difficulties and misalignments as they optimize their future work and interaction models.

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