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Interdependence in shared goal pursuit among established and impromptu dyads: Expectations, allocation, and performance

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Introduction: Transactive goal dynamics theory asserts that interdependent partners have opportunities and motivation to learn about each other's idiosyncratic skills and interests in goal pursuit, producing enhanced system-level knowledge and performance. These shared knowledge structures of each other's skills and preferences should produce more efficient allocation of tasks to complete in goal pursuit. The present study directly tests this hypothesis using an empirical demonstration that allows for a comparison of shared goal pursuit among couples with experimentally manipulated interdependence. Specifically, we examined how people allocated and subsequently completed individual tasks toward a shared outcome when working with an established partner compared to working with an impromptu gender-matched partner.

Method: To accomplish these aims, we recruited two pairs of romantic partners to complete a laboratory session. Each couple was randomly assigned to complete a series of tasks as part of either an established dyad (i.e., couples worked together) or impromptu dyad (i.e., couples traded partners).

Results: Established dyads (a) considered the system's strengths in dividing tasks and (b) divided tasks more effectively than impromptu dyads. Established dyads also expected to and did perform better than impromptu dyads.

Discussion: These findings characterize how goal interdependence manifests in close relationships.

KEYWORDS

expectations, allocation, interdependence, self-regulation, goal pursuit, close relationships

Introduction

During daily life, people work closely with others to pursue goals in multiple contexts (e.g., family life, career). Sometimes, this work involves an explicit discussion of who will do what tasks to achieve a goal. A work team might be direct about which member is expected to interact with clients while another implements a new website design. Other times, this work might progress without as much explicit delegation. A romantic couple might come to expect one person to cook dinner and the other to help their child with homework. Perhaps at some point, they had discussions about who would do each task. Or perhaps these responsibilities evolved over time—one partner did more cooking before the children were born and one partner has a stronger passion for education. Either way, few people in this scenario likely discuss each day who will do what. Instead, when they arrive home after

work, each might simply pick up these behaviors, each pursuing one of the many goals the partner shares.

In the present work, we examine whether broadly interdependent systems have a shared understanding of each other's strengths, preferences, and past experiences which allows them to allocate tasks efficiently. We focus specifically on whether this shared understanding exists, and thus we turn to situations in which collaborative dyads do not have the opportunity to explicitly discuss allocation. We compare systems comprising romantic partners (higher interdependence) to systems comprising strangers (lower interdependence) to examine the effects of interdependence on task expectations, allocations, and performance. We hypothesized that interdependent partners, compared to two strangers, capitalize on idiosyncratic knowledge of each other to allocate tasks in ways that are more efficient for their combined goal pursuit.

Our work is driven by Transactive Goal Dynamics theory (Fitzsimons et al., 2015) which formalizes empirical and lay beliefs about how people develop and implement a system of goals with their close others. One primary tenet of Transactive Goal Dynamics theory is that opportunities and motivation to learn about one's close others should facilitate efficiency in allocation of tasks and pursuit of goals, promoting the overall goal outcomes of the system as well as the individual (Fitzsimons et al., 2015). Such interdependence should be apparent in implicit goal behavior allocation—selection and delegation of tasks without explicit communication. People who know and care about each other's skills and interests should use that knowledge to inform who should do what. In these highly interdependent systems, behavioral allocation might rely more on the actual skills and interests of the individuals involved in shared goal pursuit. In contrast, strangers who lack a history of interdependence may only be able to use stereotypes about others to try to collaboratively pursue a complex shared goal. A second tenet of Transactive Goal Dynamics theory is that transactive systems could experience greater goal outcomes at the system level. When systems experience better goal coordination—which could involve efficient allocation—they should outperform less transactive systems. Essentially, effective allocation in transactive systems should enhance the effects of systems on goal performance.

Allocation of goal pursuit

Allocation refers to the process of distributing resources (e.g., time, attention) among individuals or groups. Empirical research on allocation has explored factors that influence how resources are allocated such as social norms, expectations, and the structure and culture of organizations (Nielsen et al., 2012; Schram and Charness, 2015; Sniezek et al., 1990). In relationship research, allocation often involves chores and household tasks (Gerst et al., 2021; Lackey, 1989; Pittman et al., 1996) and allocated tasks typically fall along gender lines and social norms (Coltrane, 2000; Eagly and Crowley, 1986; Sanchez and Thomson, 1997). Thus, beliefs about the gendered nature of task assignments result in division of responsibility across romantic partners in different-gender relationships (Askari et al., 2010; Hiller and Philliber, 1986). People often conform to such social norms for allocation even when they are not optimal for achieving goals (Cialdini and Goldstein, 2004). However, the scope of tasks at hand within romantic partnerships include goal pursuits that far exceed those typically captured as household tasks (Duncombe and Marsden, 1993; Kansky, 2018), and division of labor research often fails to address allocation of broader goal pursuits.

Workplace research on allocation of tasks and resources highlights structural influences on allocation (Dissanayake et al., 2015; Kozlowski and Ilgen, 2006; Porter et al., 2010; Scerri et al., 2005). More bureaucratic organizations tend to allocate resources based on formal rules and procedures, whereas more flexible and innovative organizations allow for discretion and autonomy in allocation. Traditionally, allocation decisions are directly communicated from a superordinate such as a leader, transferring the responsibility away from team members to an external source (Dunphy and Bryant, 1996; Manz, 1992). However, in highly interdependent workplace teams (e.g., high-risk teams), the allocation process becomes more insular and automatic (i.e., less explicitly communicated), and provides insight into how interdependence might shape implicit allocation of goal pursuit. In teams where allocation requires automatic allocation, relying on previous experience and knowledge (Cummings and Haas, 2012), coordination (Minnikin et al., 2022; Won and Hannon, 2013), matching allocation choices to situational demands (Locke and Latham, 1990; Lord and Hanges, 1987; Schmidt and Dolis, 2009), and considering others' motives (Minnikin et al., 2022), promotes more efficient and accurate allocation decisions.

Across these literatures on allocation, themes emerge to provide insight into how interdependent systems allocate goal pursuits within the system. First, expectations are likely to form for who does what and when, as well as how momentary fluctuations in motivation and energy influence behavioral allocation. In both romantic couples and teams, people seem to come to expect, either through social norms or past behavior, specific individuals to complete certain tasks. Second, allocation can and does occur without explicit discussion. Both patterns are consistent with Transactive Goal Dynamics theory. Importantly, in this past research on gender allocation of tasks within the household and workplace, allocation may have been driven by gendered or role stereotypes (Thompson et al., 2020). According to Transactive Goal Dynamics theory, effective allocation should capture more than just these shared societal expectations. Systems, such as romantic partners, that have adequate motivation and opportunity to learn about each other's self-regulatory preferences and skills (Fitzsimons et al., 2015), should demonstrate even more efficient allocation than social role expectations afford.

Transactive memory as prototype for means allocation

We propose efficient allocation dynamics within systems parallel transactive memory dynamics. With transactive memory, shared systems develop between individuals in relationships and teams for encoding, storing, and retrieving information that highlights the natural, unspoken patterns systems use for

sharing memory load (Wegner et al., 1991). Although transactive memory may involve explicit delegation of memory load, it often emerges without discussion or intention. Transactive memory exists across multiple types of relationships where interdependence occurs, including close relationships (e.g., romantic partnerships, friendships) and larger groups and organizations (e.g., work teams), and is associated with better performance as a system (Brandon and Hollingshead, 2004; Moreland, 1999; Ren and Argote, 2011). A key test of transactive memory investigated whether in established systems, dyads would demonstrate implicit assignment expectations in which each member specializes in remembering specific areas of information (Wegner et al., 1991). In this seminal study, individuals completed a memory task either with their established relationship partner or an impromptu partner. Established dyads demonstrated more specialization, producing greater collective recall than did impromptu dyads. This specialization occurred without explicit discussion, suggesting that interdependent dyads drew on shared knowledge of each other, much in the same way we propose established couples might allocate means of goal pursuit without needing explicit discussion.

Workplace research on cognition within teams has reinforced the idea that systems benefit from team cognition (DeChurch and Mesmer-Magnus, 2010). Team cognition can take several forms, including (a) shared mental models where team members are similar in how they think about a particular task and (b) transactive memory which involves how team knowledge is distributed and understood (Kozlowski and Ilgen, 2006). Despite meta-analytic evidence that team cognition demonstrates a moderately sized positive association with team performance in over 65 studies, very few studies investigate these processes outside of specific task-focused groups (DeChurch and Mesmer-Magnus, 2010). In this meta-analysis, only the seminal research by Wegner and colleagues examined these transactive processes in romantic couples, who share substantial interdependence beyond training and focus for a specific task (Fitzsimons et al., 2015; Rusbult and Van Lange, 2003), whereas teams that have been mostly investigated tend to share more limited interdependence and are often highly trained with explicit roles (Blaser and Seiler, 2019; Marks et al., 2002; Salas et al., 2008). Finally, the research on allocation tends to measure byproducts of team cognition such as performance and motivation, rather than observe that cognition in action.

Shared goals as a stimulus for increased motivation

Interdependent systems do not only share cognition; they also share motivation. That is, interdependent systems' performance may benefit because working together can increase motivation, the perceived value of an outcome, or efficacy to reach an outcome. Social cues signaling collaborative (vs. independent) work in interdependent relationships result in greater intrinsic motivation, coordination, cooperation, and effort on tasks (Carr and Walton, 2014). Similarly, individuals pursue goals more intensely and exhibit greater goal-consistent behavior when working with similar others (Shteynberg and Galinsky, 2011) and those with whom they are in satisfied relationships (Carr and Walton, 2014; Hofmann et al., 2015). In interdependent systems, individuals often share mental models (DeChurch and Mesmer-Magnus, 2010; Karan et al., 2019; Rossignac-Milon et al., 2021), likely including their interpretation and value of goal outcomes and means for pursuit. This natural tendency can be enhanced by formal agreements for sharing pursuit. For example, romantic couples who were randomly assigned to manage finances through a shared bank account (vs. individual accounts) developed greater financial efficacy and maintenance of engagement in means in addition to feeling more aligned in their financial goals (Olson et al., 2023). These findings highlight the potential performance benefits of shared or collective efficacy—a group's shared belief in its joint capabilities to organize and execute the course of action required to reach a goal (Bandura et al., 1999; Sterba et al., 2011; Tasa et al., 2007; Watson et al., 2001). Combined, this evidence suggests that merely pursuing a goal *with* one's partner might increase effort and motivation.

The present study

Interdependence is a psychological construct that involves overlapping resources (e.g., time, knowledge) and motivation (e.g., relational orientation) and, as such, is difficult to experimentally manipulate in the research laboratory. Although theories that highlight the importance of interdependence in goal pursuit, such as Transactive Goal Dynamics, have recently gained traction in their theoretical contribution, lack of experimental tests of the role of interdependence in goal pursuit limits understanding of the ways that systems work together to reach their goals. Drawing on the seminal transactive memory study design (Wegner et al., 1991), we developed an experimental protocol to manipulate interdependence and investigate the potentially overlapping role of interdependence on goal pursuit expectations, allocations of means, and system-level performance on a shared goal. Specifically, we recruited pairs of dyads to simultaneously participate in an experimental research session in the laboratory. We randomly assigned participants to work in established dyads (i.e., with their own romantic partner) or in impromptu dyads (i.e., with someone else's romantic partner). We investigated expectations for goal pursuit, allocation of goal means, and performance. Given that performance expectations and preferences are likely to involve gendered stereotypes (Askari et al., 2010; Hiller and Philliber, 1986; Twiggs et al., 1999), we incorporated a yoked design that controlled for gender.

We propose efficient allocation dynamics within systems will parallel the transactive memory dynamics first observed by Wegner et al. (1991). The paradigm used by Wegner and colleagues did not allow dyads to discuss roles or task assignments, forcing them to rely on whatever unspoken and shared sense of responsibilities they had prior to the experimental session. In their work, established dyads demonstrated specialization and outperformed impromptu dyads in total information recalled (Wegner et al., 1991). We drew on this research as a model for considering how interdependent knowledge structures of partners' skills and interests might be demonstrated with task allocation for a shared goal even without opportunity for explicit discussion. We reasoned that established couples would have more nuanced expectations of

the strengths, weaknesses and preferences of their partner relative to impromptu dyads, as well as better understanding of their partners' expectations of them. In impromptu dyads, individuals would lack insight into the partners' strengths and expectations of themselves and have access primarily only to their own perceived strengths and weaknesses. Thus, we expected that allocation of tasks should reflect awareness of both members' strengths in established dyads more than in impromptu dyads (*Hypothesis 1*). That is, established dyads should make choices about which tasks to complete based on both their own strengths and the strengths they perceive their partner to have. In contrast, in impromptu dyads, we would expect to see a lack of awareness of one's partner's strengths and preferences. We also reasoned that established (vs. impromptu) dyads should engage in less redundant task allocation (*Hypothesis 2a*) and demonstrate greater shared motivation (*Hypothesis 2b*)[1].

Lastly, we expected performance benefits from having one's partner as a teammate (*Hypothesis 3*). The benefits of working with one's partner may manifest in two forms. First, we may observe a main effect of teammate condition on performance regardless of how tasks are selected. This improved performance benefit might arise for multiple reasons, including both improved efficiency (*Hypothesis 3a*) or heightened motivation *(Hypothesis 3b).* Second, we might observe that performance benefits of working with one's partner only emerge when individuals are free to choose their own tasks. In this case, we would expect an interaction pattern such that established dyads would outperform impromptu dyads only when they chose the tasks for each to complete. All studies, measures, manipulations, and data/participant exclusions are reported in the manuscript or its Supplementary material.

Method

Participants

We recruited 186 couples (372 individuals) from the undergraduate student body of two universities (one public, one private) in the United States. We did not conduct an a priori power analysis. Instead, due to the complicated experimental and in-person laboratory design, we aimed to recruit as many dyads as possible by end of an academic year. Because we were primarily interested in dyad-level effects, we calculated power based on the number of dyads rather than the number of individuals who participated. Using G-Power, we observed 80% power to detect an effect size as small as Cohen's $f = 0.14$ (a small to moderate effect). Participants received either partial completion of a course requirement or $20 in cash for participation. Participants were recruited through flyers and research participant pools. Participants were 19.6 years old on average and identified as male (47.5%), female (51.8%), and gender non-conforming (0.8%). Although participants were young adults, they had reasonably long romantic relationship duration ($M = 11.85$ months, $SD = 17.01$); most couples (90%) did not live together. Participants identified as White (62.1%), East Asian (10.1%), South Asian (9.5%), Black (6.0%), Hispanic (7.9%), or a different race (4.4%).

Procedures

Two couples who did not know each other participated in each laboratory session. Participants were randomly assigned to work as established or impromptu dyads. In the established condition, participants worked on a dyad with their own romantic partner[2]. In the impromptu dyad condition, participants traded partners, resulting in two dyad each with one member of each couple; teammates were matched to partner's gender to control for gender stereotypes regarding task performance. We refer to pairs in both conditions as *dyads* for the purpose of clarity. After dyads had been assigned, participants were separated into individual rooms and prevented from communicating with the other three participants for the duration of the experiment.

Participants then completed (counterbalanced order) questionnaires and a task prediction, allocation, and performance procedure; questionnaires are not considered in this work. In the task allocation portion, individuals were told they would be completing a series of tasks on which their performance would be evaluated. They were told scores on the tasks would be calculated as a dyad—with total dyad scores resulting from a combination of their score and their teammate's score. Participants were explicitly prompted to 'think about how you might allocate the tasks between you and your partner' while watching a video previewing the 16 tasks (see Figure 1; Table 1). After watching this video, participants reported expectations for their own and their teammates' performance on each task.

After reporting these expectations, participants were assigned to an allocation condition, either free choice (i.e., self-selected) or yoked (i.e., assigned) condition. In the free choice condition, participants chose eight tasks to complete, knowing their teammate would also be choosing eight tasks. Participants were told that for any task uncompleted by either member of the dyad, the dyad earned a 0. In the yoked condition, participants did not choose tasks; instead, participants went directly to completing the tasks, and thus, they do not have allocation scores. Yoking matched tasks by gender and couple type (same/different gender) to allocations made by previous participants in the free choice condition. This stringent yoking procedure precisely matched the number and type of tasks completed across conditions as well as controlled for gender stereotyping effects on task expectations. Through this experimental manipulation, we controlled whether participants completed tasks according to their own choices or the other's choices.

To incentivize allocation and performance, participants were informed their dyad's performance would be compared to other dyads in the study, with both individuals in the highest scoring dyad across the study receiving a $200 gift card. Participants were thus competing against each other, but not only against the other dyad in their laboratory session. Without any chance to explicitly coordinate, participants had to rely on implicit understanding of each other's strengths, weaknesses, and preferences to determine which tasks their partner might choose. The incentive should also

1 The shared motivation hypothesis was developed during the review process and should be considered *post-hoc* rather than a priori.

2 Participants did not know they would be completing the study with other dyads or possibly working on tasks with their partner or another person's partner prior to arriving at the laboratory.

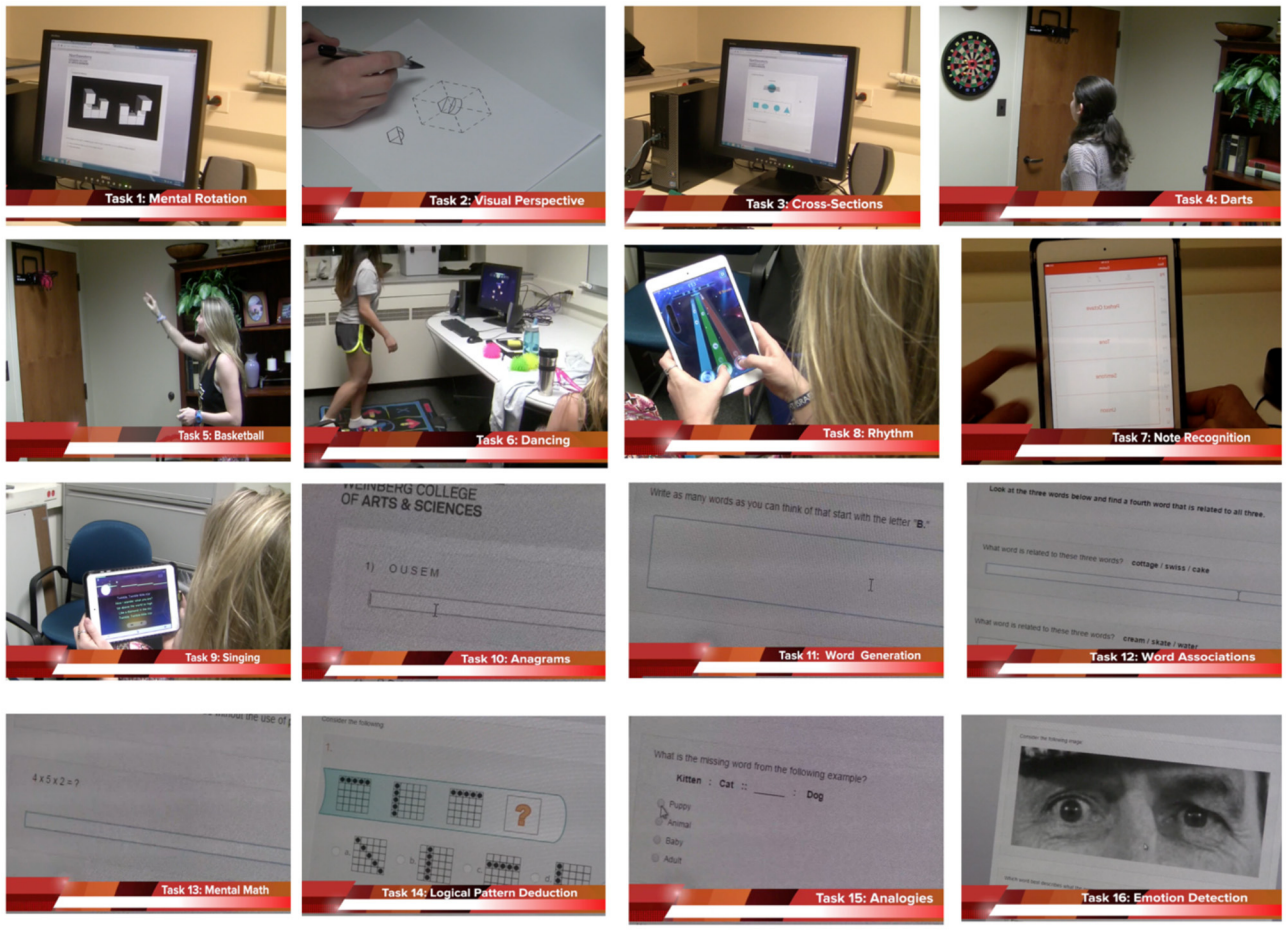

FIGURE 1
Image overview of the tasks. Images were taken from an instructional video that participants viewed prior to completing tasks.

have motivated performance on each task completed (regardless of whether chosen or assigned).

Stimuli

We chose 16 tasks to tap into domains specified by Gardner's multiple intelligences research (Gardner, 1983). The tasks ranged from GRE quantitative questions to shooting basketball hoops to distinguishing between two tones (see Table 1 and Figure 1 for more information). Tasks were designed to take ~3 min to complete (see Karan et al., 2019; Rossignac-Milon et al., 2021). Participants were asked to stop each task after 3 min however they could stop a task early. Participants completed tasks in a predetermined randomized order and could not return to a task once they stopped working on it.

Measures

Allocation

Allocation was represented by the number of non-redundant selections chosen by each dyad. Fully redundant scores (i.e., each member of a dyad did the same tasks) received a value of 8 and minimally redundant scores (i.e., no member of a dyad did the same task) a value of 16; allocation scores ranged from 9 to16 ($M = 12.52$, $SD = 1.49$). Allocation scores were used to test Hypotheses 2a.

Performance expectations

Participants reported how well they thought (a) they would perform on each of the sixteen tasks and (b) their teammate would perform, each in comparison to other participants. Questions used a slider scale from 0 to 100 to indicate the percentage of participants that individuals thought they/their teammate would outperform. We reasoned that variability in expectations might reflect awareness of a teammate's relative strengths and weaknesses, and these represent idiosyncratic insights about the teammate. Thus, we also calculated within-person standard deviations of the expectations for each teammate across the 16 tasks. Smaller standard deviations reflected less variability in expectations whereas larger standard deviations reflected more variability. Participants additionally reported a summary comparison of their *team* to others using a single item with the same scale. Note that in established dyads, the teammate was the romantic partner and in impromptu dyads, the teammate was a gender-matched stranger.

TABLE 1 Brief task descriptions.

Task	Name	Description
1	Mental rotation	Determine whether two images of a rotated block structure are the same or different
2	Perspective taking	Determine the angle from which an object is viewed
3	Cross-section	Determine the cross-section in an odd shape created by that slice
4	Darts	Throw magnetic darts at the bulls-eye area of a dartboard
5	Backdoor basketball hoop	Try to get as many baskets into a small back door basketball hoop
6	Dancing	Play a dancing game similar to Dance Revolution
7	Musical note recognition	Distinguish between presented tones and notes
8	Rhythm	Match the rhythm presented (similar to Guitar Hero)
9	Singing	Accurately (on pitch and timing) sing songs
10	Anagrams	Unscramble anagrams into standard English words
11	Semantic fluency	Come up with as many words as possible that start with a given letter
12	Word associations	Produce a fourth word that unifies a set of three presented words
13	Mental math	Complete a series of multiplication problems that range in difficulty
14	Logical pattern deduction	Choose the correct answer to complete a logic pattern
15	Analogies	Choose the correct answer to complete an analogy
16	Reading the mind in the eyes	Choose the correct emotion associated with the eyes

Shared and individual expectations

These performance expectations questions also allowed us to tap into a potential *motivational* mechanism of working with one's own partner vs. an impromptu partner (Hypothesis 2b). For these analyses, we utilized the single item in which participants indicated how well they thought their team would perform relative to other teams (described above). We additionally explored differences in performance expectations of oneself and one's teammate.

Concordance between expectations and task choice

For participants in the free choice conditions, we created indexes that reflected (a) the degree to which their task choices reflected their own expected performance and (b) the degree to which their task choices reflected their teammates' expected performance. These indexes were within-person correlations of whether the participant chose the task (0 = did not choose, 1 = chose) and the performance expectation (0–100) on that task. For participants' expectations about their own performance, *positive* within-person correlations suggest that task choices reflected tasks on which participants expected they would perform relatively better. Participants presumably *did not* choose tasks on which they thought their teammate would perform relatively well. Consequently, for expectations about teammate's performance, *negative* within-person correlations suggest that task choices reflected tasks on which participants expected their teammates would perform relatively better. Participants in the yoked conditions did not choose tasks to complete and so we could not create these indexes for them. Because correlations are not normally distributed, these correlations were transformed using a Fisher r-to-z procedure for all analyses.

Dyad performance

To create more easily interpretable scores of performance, we assigned participants a decile score between 0 (bottom decile) and 9 (top decile) for each task they completed. By using deciles instead of raw scores, we created a consistent scoring metric across the 16 tasks that varied in distribution and range of scores. Dyads also earned a 0 for any task *not* completed by either teammate; for any task completed by both members of the dyad, we retained the higher score. Dyad performance was calculated by summing dyad scores across the 16 tasks. Thus, scores could range from 0 (poorest performance on every task) to 144 (highest performance on every task, no redundancy). Dyad performance scores ranged from 21 to 112 ($M = 62.23$, $SD = 17.19$).

Results

For analyses of performance expectations, we treated individuals as the unit for analysis. For analyses of allocation and performance, we treated dyads as the unit of analysis. Only dyads in the free choice condition completed the allocation task. Thus, degrees of freedom varied across analyses. We retained all data from complete participants.

Performance expectations: concordance between expectations and task choice

As evidence of participants' understanding of their partners, we considered whether participants appeared to have insight into their teammates' unique strengths. Here, we compared the *standard deviations* of participants' expectations for the teammate across the 16 tasks. Predictions of teammate performance were more variable when people made predictions for established ($M = 18.90$, $SD = 6.83$) than for impromptu partners ($M = 13.53$, $SD = 7.66$), $t_{(364)} = 7.06$, $p < 0.001$, $d = 0.74$.[3] Variability in participants' predictions of their own performance did not differ across teammate condition, $t_{(364)} = -0.54$, $p = 0.587$, $d = -0.06$ (95%CI: −0.78, 0.67).

We also reasoned that participants' task choice should reflect their expectations. Because established dyads were working with teammates about whom they might have more unique and confident insights, we expected these individuals to make task

3 Indeed, the only participants who expected their partner to perform the exact same on every task (i.e., no variability in performance expectations) were in the impromptu ($N = 10$) rather than the established teammate ($N = 0$) condition, $\sum^2 = 3.84$, $p < 0.001$.

TABLE 2 Correlations between predictions of performance and task completion across condition and partner.

	Own correlation	Teammate correlation
Established	0.50	−0.21
Impromptu	0.64	0.02

Fisher r to z' transformations were used for all analyses, but outcomes are reported as r values for ease of interpretation.

choices that balanced expectations about their own performance and expectations about their teammate's performance. Thus, we evaluated the extent to which the tasks that participants chose to complete matched the tasks on which they predicted they (or their partners) would perform well. For this analysis, we examined participants in the free choice condition as only in this condition could they choose tasks to complete. As Table 2 shows, correlations between expectations about personal performance and task choice in both conditions were positive indicating that participants prioritized completing tasks on which they predicted higher personal performance, however, this tendency was stronger in the Impromptu than in the Established dyad condition, $t_{(188)} = 3.30$, $p = 0.001$, $d = 0.50$. Table 2 also shows that the Impromptu and Established dyad conditions differed in the average match between task choice and their expectations about their *partner*'s performance $t_{(184)} = -3.38$, $p < 0.001$, $d = -0.51$. Here, participants' expectations of their teammates' performance were unrelated to their task choices in the Impromptu dyad condition but negatively related to their teammates' expected performance in the Established dyad condition.

Performance expectations: shared motivation

Performance expectations can be thought of as representing a motivational outcome—the more a person thinks they or their team will outperform others, the more motivated they might be to exert effort on tasks. Participants demonstrated evidence of shared motivation as participants rated the team as more likely to perform well when they were in the established condition ($M = 71.07$, $SD = 16.34$) than when they were in the impromptu condition ($M = 64.02$, $SD = 17.02$), $t_{(364)} = 4.01$, $p < 0.001$, $d = 0.43$. Participants also rated themselves as individuals as being more likely to outperform others across the 16 tasks in the established condition ($M = 63.70$, $SD = 13.13$) than in the impromptu condition ($M = 58.44$, $SD = 12.85$), $t_{(364)} = 3.58$, $p = 0.004$, $d = 0.38$, and expected their teammate to perform better relative to others in the established ($M = 68.58$, $SD = 70.23$), than in the impromptu ($M = 60.39$, $SD = 12.88$), $t_{(364)} = 6.22$, $p < 0.001$, $d = 0.67$.

Allocation

Only participants in the free choice conditions provided allocation data. We used an independent samples *t*-test to evaluate whether established dyads allocated more efficiently than impromptu dyads. The total number of tasks chosen to complete was greater in established dyads ($M = 13.07$, $SD = 1.50$) than in impromptu dyads ($M = 11.78$, $SD = 1.12$), $t_{(92)} = 4.60$, $p < 0.001$, $d = 0.97$ (95% CI: 0.70, 1.24), reflecting less redundancy.

Performance

Established dyads ($M = 65.06$, $SD = 17.71$) outperformed impromptu dyads ($M = 58.45$, $SD = 15.81$), $t_{(180)} = 2.61$, $p = 0.010$, $d = 0.39$. We also examined whether this effect differed among dyads in the free choice or yoked conditions using a moderation analysis. Although we reasoned established dyads might perform particularly well in the free choice (vs. yoked) condition, there was no interaction between partner and condition, $F_{(1,178)} = 0.45$, $p = 0.502$, $?^2 = 0.003$ (90% CI: 0.000, 0.028).

Associations between allocation, shared motivation, and performance

Partner type had a nonsignificant effect on performance within dyads who made choices about their tasks ($M_{established=}66.46$, $SD = 17.64$; $M_{impromtu=}61.53$, $SD = 17.09$), $t_{(92)} = 1.36$, $p = 0.177$, $d = 0.29$ (95%CI: −3.20, 3.77). However, shared motivation and performance were correlated, $r = 0.17$, $p = 0.02$, and within the free choice condition (only participants in the free choice condition made allocation choices), allocation and performance were correlated, $r = 0.45$, $p < 0.001$. Because mediation can still be observed when direct effects are not significant, we used PROCESS (Hayes, 2013) to examine mediation of performance by shared motivation and allocation.

We observed an indirect effect of teammate condition on performance through allocation. The indirect pathway was significant, $B = 7.22$ ($SE = 2.20$, 95% CI: 3.35,12.25), $Z = 3.20$, $p = 0.001$, indicating that established teammates facilitated allocation, and that associations between teammate condition and performance were related to improved allocation. We did not observe an indirect effect of teammate condition on performance through shared motivation, $B = 0.69$ ($SE = 0.60$, 95% CI: −0.56, 1.87), $Z = 1.13$, $p = 0.26$. Thus, although participants did report greater shared motivation when working with their established partner than an impromptu partner, the performance benefits that were conferred from working with one's own partner do not likely involve greater performance expectations from doing so.

Both of these patterns were observed cross-sectionally, that is, allocation, performance expectations, and performance were measured outcomes that followed an experimental manipulation. Therefore, conclusions about causality must be considered carefully. However, these associations provide conceptual support for the potential role of allocation and less support for the role of shared motivation in facilitating dyadic performance.

Discussion

Using an experimental paradigm, we manipulated interdependence to empirically examine how systems with

unique shared knowledge structures delegated and performed on real behavioral tasks. In this work, communication between dyads was restricted so that these patterns could be interpreted as arising from shared knowledge structures and patterns of prior goal pursuit. Participants demonstrated behavioral choices that involved more idiosyncratic knowledge of their teammate's strengths when working within an established dyad and took their teammate's perceived strengths into account when making choices about which tasks to complete. In contrast, in impromptu dyads, participants made choices about which tasks to complete in line with their own perceived strengths. Established (vs. impromptu) dyads also demonstrated less redundant allocation during the task, further supporting the idea that interdependence in goal pursuit involves an implicit understanding of close partners' strengths, weaknesses, and preferences.

Historically, most empirical and theoretical models of self-regulation adopted an individual-focused approach (Carver and Scheier, 1982; Kruglanski et al., 2002; Trope and Liberman, 2010). More recently, attention has been increasingly directed toward the importance of social contexts that shape goal pursuit (Fitzsimons and Finkel, 2010, 2011; Orehek and Forest, 2016). Our findings highlight the value of this shift by showing that established dyads regulate goal pursuit at a system level by drawing on the system's strengths to effectively divide tasks.

The analyses we conducted about performance in established vs. impromptu dyads indicate a complex pattern of how interdependence influences dyadic outcomes. On the one hand, allocation patterns were related to performance, and in the free choice condition, teammate condition predicted allocation-mediated performance. On the other hand, when considering both free choice and yoked conditions, we observed a main effect of teammate condition and no interaction effect between teammate and allocation conditions. Thus, working with one's partner was beneficial across pairs, not just for those who were able to capitalize on shared knowledge of each other through more efficient allocation. Established couples who were given a chance to choose their own tasks outperformed established couples who were not; established couples who were not given a chance to choose their own tasks still outperformed impromptu dyads who likewise were not given a chance to choose their own tasks. Given that individuals in each dyad worked individually on each task, this improved performance is not likely due to direct influence by the partner.

Shared motivation may have contributed to these performance benefits, however, we did not observe evidence that these effects could be due to *shared efficacy*. *Post-hoc*, we speculate that other motivational factors such as sharing rewards may have overshadowed the benefits conferred by efficient allocation. In other words, established dyads may have been more motivated to succeed in both conditions and in the yoked task condition, this motivation may have compensated for not choosing their own tasks. Although we measured performance, we did not measure effort, either subjectively or objectively. Thus, it is alternatively possible that allocation conferred an unobserved benefit of making the same level of performance feel easier for dyads who were able to choose their own tasks, allowing them to maintain energy on more of the tasks. Other explanations for the lack of performance differences may have come from the fact that the incentives may have been less motivating to impromptu dyads regardless of task assignment condition because they would not get to work with or celebrate the reward with their teammate. These participants would also receive a reward without their romantic partner receiving one, something that may have dampened motivation in both conditions in the impromptu dyads. Future research that investigates differences in expectations to share rewards across partners would be helpful to understanding these effects. In other systems, shared rewards might exist as household benefits for roommates (e.g., rewards for lower energy costs) or workplace teams (e.g., team bonuses for high performance). To the extent that shared rewards outweigh benefits of allocation advantages in other situations, we may better come to identify allocation and motivation as related but distinct pathways to collective performance.

Limitations

Participants worked on individual tasks alone. Thus, this experiment reflects means allocation only for such tasks (e.g., one person completes budgeting tasks) rather than collective tasks (e.g., jointly developing a plan to increase savings). Moreover, although participants could not discuss task choices with their teammate, both individuals were aware they were making choices. The experimental paradigm we employed might not generalize to all the ways that dyads share goal pursuits, for instance, although couples might develop a shared understanding of who is responsible for making sure bills are paid, that decision might at least initially involve explicit discussion. Still, when it comes time to check in on the bank accounts, one person might feel more responsibility to do so while the other rests easier knowing that the task is covered, suggesting the experimental paradigm might approximate goal pursuits about which dyads already share knowledge or experience. Additionally, it is difficult to know how competitive motivations may have influenced choices or performance. Some individuals may have withheld effort if they were working with an impromptu stranger out of the hopes that their romantic partner working in a different dyad would be more likely to win the single cash prize. Others may have calibrated their own task choices around the known strengths or weaknesses of their partner who was working in a different dyad to try to maximize their own dyad's success. Ultimately, each person was responsible only for completing the tasks they chose, and their choices had no effect on the other dyad participating in the research session, minimizing the potential for sabotaging someone else's success. Future research investigating how the shared goal systems we observed emerge and manifest in everyday life, particularly as dyads face novel or challenging goals that involve competition[4] or require explicit discussion to manage would be helpful for understanding the extent of influence of interdependence on goal outcomes.

4 Systems may have competition with each other, for example when they try to outperform each other in physical tasks or to earn higher levels of perceived status within a family system, or with other systems, as when they try to outperform others by having a more manicured landscape than their neighbors.

In the present research, we restricted half the sample to making allocation choices. Although we could have asked participants who would eventually complete yoked tasks to make task selections, we were concerned that choosing tasks and then being asked to complete different tasks would decrease motivation. Thus, we elected for these participants to complete tasks without knowledge that they could have instead chosen their own tasks in a different condition. We expected participants who knew they were completing tasks by assignment whereas others were completing tasks by choice may have experienced decreased motivation.

Additionally, the specific paradigm we used in which impromptu couples were not given a chance to become close to or learn about the other person means that the interdependence we examined involves both of those features. Had participants in the impromptu condition been given a chance to become close (e.g., through a Fast Friends paradigm) or to gain knowledge of each other, would either knowledge or closeness be sufficient on its own to produce different patterns of expectations, allocation, and performance? Future research might consider the minimum degree of interdependence required for allocation and performance effects to occur.

Finally, although we recruited a sample of established romantic couples, the sample was relatively young, and the average length of the relationship was less than a year. Given this, it is possible these couples were not well-established or in a honeymoon stage which could prevent findings from generalizing. However, the fact that we observed robust effects of working with one's own partner (vs. a stranger) in these young adult relationships suggests these effects may be stronger among couples with higher rates of cohabitation and longer relationship duration. An additional limitation that could have influenced the results is that only couples with relatively high relationship satisfaction volunteered to be in the study. Again, this limitation is somewhat mitigated by the relatively young sample, however, the ways these effects change alongside relationship satisfaction would be interesting for future research. Although these limitations certainly apply to the present research, interdependence in goal pursuit is expected to exist across many types of relationships that have more restricted interactions (e.g., co-workers) or different degrees of contact (e.g., friendships; Fitzsimons et al., 2015), not only in lengthy and satisfied romantic relationships.

Future directions

An assumption in allocation research is that the most efficient, task-focused approach is desired. However, this might not be the case in all interdependent systems. In the context of close relationships, efficiency and performance may not always be desired. Romantic partners often make less optimal decisions to accommodate the needs and wants of their partner (Finkel and Campbell, 2001; Gore and Cross, 2011; Joel et al., 2018; Rusbult et al., 1998). Given the option, romantic partners may consider partner preferences and choose *less efficient* means to preserve or protect relationship satisfaction or reduce conflict. In some cases, partners may choose to complete tasks that could be done independently (e.g., childcare, household chores) together to increase the enjoyment of the task. Future research should investigate when individuals in interdependent dyads will opt for efficiency over harmony and the impact of these decisions on motivation, goal performance, and relationship outcomes.

Our results also suggest that transactive gain may be achieved through multiple routes. Whereas participants were more aware of their established partners' skills and interests—and that awareness resulted in task choices that were more efficient for the dyad, established dyads outperformed impromptu dyads even when they did not have the advantage of controlling their own task choices. These results suggest that the features proposed to facilitate goal-related interdependence in Transactive Goal Dynamics theory—such as motivation and opportunity—might exert main effects on goal outcomes in addition to indirect effects through goal-related interdependence. In other words, transactive gain from efficient allocation may not be necessary for systems to perform well. Although Transactive Goal Dynamics theory does not preclude such main effects of motivation and opportunity directly on transactive gain, further consideration of these pathways may produce better prediction of performance in groups, dyads, and teams. Finally, additional research is needed to understand the boundary conditions of sufficient interdependence. At what point do systems know each other well enough, or care about each other enough, to engage in more efficient allocation or share improved performance?

Conclusion

Results provide insight into how transactive systems approach goal pursuit. Established dyads work harder for shared incentives and they draw on unique knowledge they have gained from interdependence to make decisions about means allocation. These results suggest that people can experience transactive gain, engaging in more efficient and effective goal pursuit together in established systems. Further examinations of how systems develop and apply their idiosyncratic relationship-level knowledge may improve understanding of behavioral goal pursuit and outcomes.

Data availability statement

The datasets presented in this study can be found in online repositories. This data has been deposited via the OSF, https://osf.io/572cp/?view_only=267881926e864c12b1a943781e37d052.

Ethics statement

The studies involving humans were approved by Northwestern University Institutional Review Board. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

MvD: Conceptualization, Formal analysis, Investigation, Project administration, Resources, Supervision, Writing – original draft, Writing – review & editing. JW: Formal analysis, Writing – original draft, Writing – review & editing. EF: Conceptualization, Funding acquisition, Methodology, Resources, Supervision, Writing – review & editing. GF: Conceptualization, Funding acquisition, Investigation, Methodology, Resources, Writing – review & editing. AH: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/frsps.2025.1497295/full#supplementary-material

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