

An interpersonal strengths use intervention: a new dyadic concept & examining the effects on strengths use, relational energy and job performance

MSc Thesis

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Abstract

Strengths use has been studied and stimulated for the positive effects on well-being and work engagement. However, in most organizations employees also seek out each other's strengths, yet little is known about *interpersonal* strengths use. Interpersonal strengths use is an interpersonal pro-active working strategy, whereby the actor seeks out the partner's strengths. Besides introducing interpersonal strengths use, we examine the effects on strength use, relational energy, and job performance. Using a quasi-experimental design with a waiting list, we examined the effects of a newly designed interpersonal strengths use intervention. We adopted the round-robin design for dyadic data collection and analyzed the data with R using the social relations model (Snijders and Kenny, 1999). The sample consists of 518 dyadic ratings from IT consultancy professionals from Ordina. We found that interpersonal strengths use intervention indeed stimulated interpersonal strengths use, and interpersonal strengths use energizes those who seek out strengths in others. However, we could not show the effects of interpersonal strengths use on strengths use and relational energy of the person approached to use their strengths. Additionally, we found no significant effects on job performance. The theoretical contribution of this study is introduction of interpersonal strengths use as a proactive interpersonal energizing working strategy. The methodological contribution is adapting the R-code to analyze round-robin data over time. The practical implications are that interpersonal strengths use is energizing for yourself, and the intervention is valuable since it stimulates interpersonal strengths use. Future research should focus on the boundary condition that make interpersonal strengths use energizing for the partner as well. Additionally, future research should examine potential moderators like strengths identification and strengths diversity.

Keywords: *interpersonal strengths use, strengths use, relational energy, job performance, intervention, social relations model, round-robin, dyads, R*

Executive summary

Organizations are structures of collaborations (Boyatzis and Rochford, 2020), developing pro-active interpersonal methods that improve collaborations will be valuable throughout entire organizational structures. Since a lot is known about strengths use and its positive effects on well-being (Wood et al., 2011; Proctor et al., 2011; Gander et al., 2013; Harzer, 2020). Managing organizations goes hand in hand with fostering employee well-being (Danna and Griffin, 1999; Grawitch et al., 2006). So if we could combine those collaborations and strengths use, it must be twice as interesting for organizations. Therefore, we want to elevate strengths use to the interpersonal level, and since we do not know anything about it, we want to examine how it affects other outcomes besides well-being. Therefore the purposes of this study are: to introduce interpersonal strengths use (RQ1), stimulate it with an intervention (RQ2) and examine how it affects strengths use, relational energy and job performance (RQ3).

First, we introduce interpersonal strengths use, which is an individual (*actor*) seeking out the strengths of another individual (*partner*), visualised in the Figure 1.

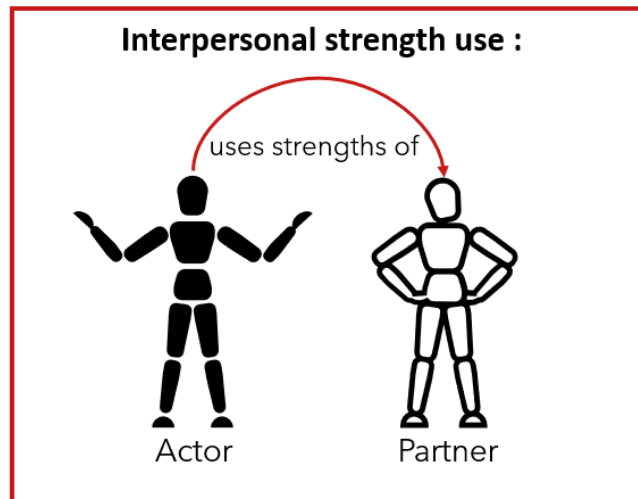


Figure 1: Visualisation interpersonal strengths use

Following this, we developed an intervention with the aim to stimulate interpersonal strength use (hypothesis 1). Therefore we build on strengths use interventions, and transform the activities focusing on individual strengths use to interpersonal-oriented activities. The structure of the interpersonal strengths use intervention follows the three steps used in strengths use interventions: identify, develop and use of strengths (Meyers and van Woerkom, 2017). Lastly, having attempted to stimulate interpersonal strengths use with the intervention, we examine the effects on strengths use (hypothesis 2), relational energy (hypotheses 3 & 4) and job performance (hypothesis 5).

The quasi-experimental study design entails the experimental group participating in the intervention, while the control group does not. Then, to test the hypotheses we collected data using the round-robin design, which requires all the participants to rate each other for every variable. Both the experiment and control group filled out the pre-intervention and post-intervention survey. The study design and sample size are shown in Figure 2:

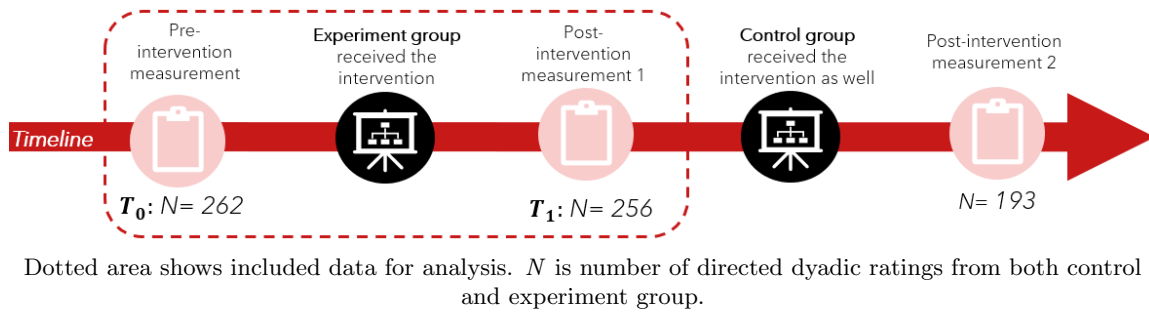


Figure 2: Quasi-experimental design visualization

The collected data consisted of 518 dyadic ratings and was analyzed using the social relations model (SRM) (Snijders and Kenny, 1999), using our adaptation of the R-code by Knight and Humphrey (2019) to conduct the SRM regression. We adjusted the R-code to conduct the pre-intervention and post-intervention analysis. Using the information from the SRM analysis, we used the Monte Carlo method for the mediation analysis of interpersonal strengths use between the intervention and the dependent variables. We tested the model shown in Figure 3, it includes the unstandardized coefficients and significance of the paths:

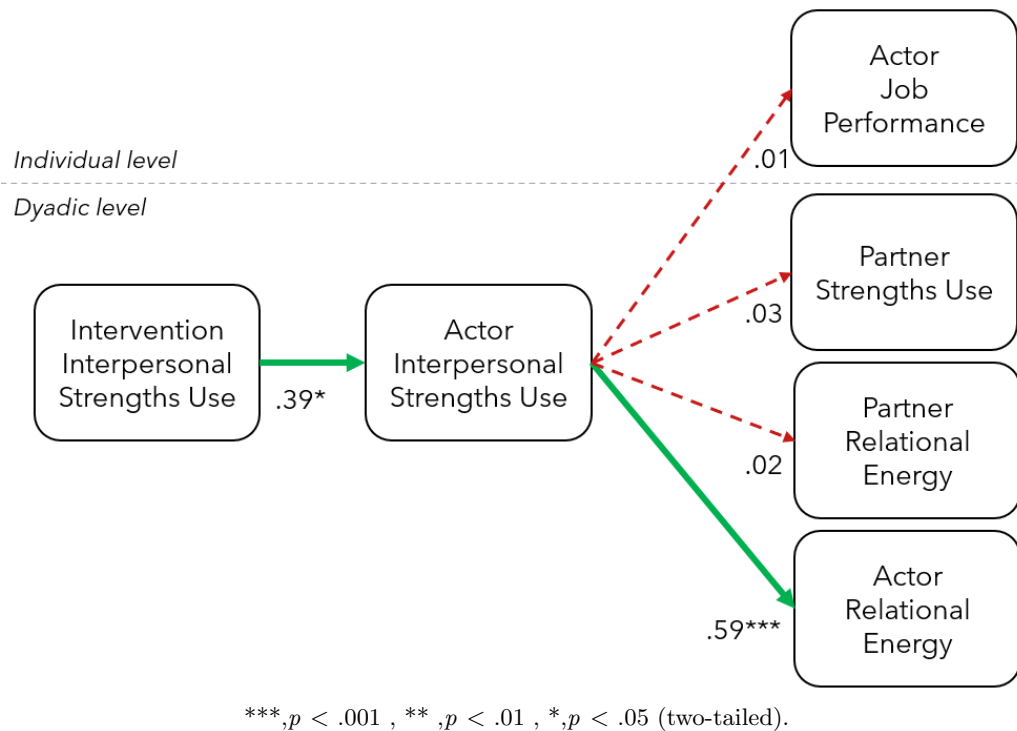


Figure 3: Results theoretical model with unstandardized coefficients and significance

The results show that the intervention positively and significantly stimulated interpersonal strengths use (supporting hypothesis 1). Further, we could not show a significant increase in partner strengths use due to increased interpersonal strengths use (no support for hypothesis 2). Next, we found that actor interpersonal strengths use increased actor relational energy significantly (supporting hypothesis 3). Lastly, we could also not show

that due to the increase in interpersonal strengths use, partner relational energy increased (not supporting hypothesis 4) and job performance increased (not supporting hypothesis 5).

To conclude, our main limitation was the length of the survey which demotivated participants and some measurement limitations making it hard to understand why some of the tested relations are non-significant. Following this, our theoretical contribution is the introduction of interpersonal strengths use, establishing a new proactive interpersonal working method. We showed that employees could make their interactions more energizing for themselves. Besides, we contributed to the SRM literature with the new R code that enables SRM analysis over time. Next, the practical contribution is that we designed an intervention that successfully stimulated interpersonal strengths use. The participants were very positive about their experience and observed the positive effects afterward. Future research should focus on the boundary condition that make interpersonal strengths use energizing for the partner as well. Additionally, we should examine potential moderators like strengths identification and strengths diversity. Lastly, we should repeat the current study with a bigger sample size to examine cross-level effects of interpersonal strength use on (for example individual or team level effects).

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From the bottom of my heart:

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Contents

List of Figures	viii
List of Tables	viii
1 Introduction	1
2 Company description	4
3 Theoretical background & model	6
3.1 Introduction Interpersonal strengths use	6
3.1.1 Strengths	6
3.1.2 Individual level strengths use	7
3.1.3 Interpersonal strengths use	8
3.1.4 Constructs that are <i>not</i> interpersonal strengths use	10
3.2 Interpersonal strengths use intervention	11
3.3 Effects of interpersonal strengths use on strengths use, relational energy and job performance	13
3.3.1 Effects interpersonal strengths use on strengths use	13
3.3.2 Effects interpersonal strengths use on relation energy	14
3.3.3 Effects interpersonal strengths use on job performance	16
3.4 Theoretical model visualization	17
4 Method	18
4.1 Study design & Procedure	18
4.2 Interpersonal strengths intervention design	18
4.3 Sample	19
4.4 Measures	20
4.4.1 Dyad level	20
4.4.2 Individual level	21
4.4.3 Qualitative evaluation of intervention	22
4.5 Analysis	22
5 Results	24
5.1 Descriptive statistics	24
5.2 Main analysis	25
5.2.1 Intervention effects on interpersonal strengths use (SRM)	26
5.2.2 Dependent variable partner strengths use (SRM)	27
5.2.3 Dependent variable actor relational energy (SRM)	28
5.2.4 Dependent variable partner relational energy (SRM)	29
5.2.5 Dependent variable actor job performance (Multilevel model)	30
5.3 Qualitative evaluation of the intervention	30
5.4 Summary	32
6 Discussion	34
6.1 Theoretical implications	34
6.1.1 Interpersonal strengths use intervention	34
6.1.2 Effects of interpersonal strengths use	35
6.1.3 Methodological contribution to SRM literature	36

6.2	Practical implications	37
6.3	Limitations	37
6.4	Future research	39
6.5	Conclusion	41
6.6	Ethics statement	42
Bibliography		43
A Intervention Outline		51
A.1	Workshop	51
A.2	Worksheet used during workshop	64
B Survey Design		69
B.1	Demographics	69
B.2	Survey given to everyone	70
B.3	Survey given to leader	73
C R-code & sample output		74
D Theoretical model translated to predictors for regression		76
E Results additional figures and interpretation SRM		78
E.1	Visualization mean and standard deviation for every variable	78
E.2	Interpretation SRM	79

List of Figures

1	Visualisation interpersonal strengths use	ii
2	Quasi-experimental design visualization	iii
3	Results theoretical model with unstandardized coefficients and significance	iii
4	The strategic pillars of Ordina	5
5	Visualisation interpersonal strengths use	9
6	The Tom & Jerry example of interpersonal strengths use	13
7	Visualisation interpersonal strengths use and dependent variables	17
8	Proposed theoretical model	17
9	Quasi-experimental design visualization with sample size	20
10	Interaction plot of the intervention effect on interpersonal strengths use	27
11	Theoretical model with unstandardized coefficients and significance	32
12	Worksheet page 1	64
13	Worksheet page 2	65
14	Worksheet page 3	66
15	Worksheet page 4	67
16	Worksheet page 5	68
17	Sample output using adapted R code	75
18	Original theoretical model (partial)	76
19	Regression predictors to extract actor and partner relational energy	77
20	Pre and post measurements interpersonal strengths use	78
21	Pre and post measurements strengths use	78
22	Pre and post measurements relational energy	78
23	Pre and post measurements job performance	78

List of Tables

1	Waiting-list control design	18
2	Descriptive statistics table	24
3	Correlation table	25
4	Regression of Actor Interpersonal Strengths Use	26
5	Regression of Partner Strengths Use	27
6	Regression of Actor Relational energy	29
7	Multilevel model for job performance	30
8	Summary results mediation hypotheses	33

1 Introduction

Do you recall a recent situation where you just know you should ask for the help of someone, for a specific strength? For instance, when you want to set up a new business and your strength is creativity but not coordination, then you should find someone to join you whose strength is coordination. Using the strength coordination of someone else who can organize, plan, and structure, leaves you with room to focus on the creative side of the new business. You are focusing on the other person's strengths rather than content-related skills. Also in professional workplaces, people use other people's strengths by asking specific people for their strengths. It seems so trivial and recurring use other's strengths, but surprisingly this strategy was unnamed until now. The current study conceptualizes it as *interpersonal strengths use*: proactively using other people's strengths.

Interpersonal strengths use is a part of our daily interactions, think about last week: how often did you approach someone because of their strength? Despite the intuitive existence of interpersonal strengths use, it still needs to be studied as a construct in scientific literature and we know little about how it works. This study examines what interpersonal strengths use is and pioneers into understanding how interpersonal strengths use affects strengths use, relational energy, and job performance. Strengths use is valuable since we want to continue monitoring how the interpersonal variant affects individual strengths use. For example, is it more stimulated on a personal level, or does it not affect strengths use on an individual level? Next, relational energy refers to energy generated from dyadic interactions (Owens et al., 2016). Relational energy is valuable since it enables work engagement and positively affects job performance (Owens et al., 2016). Lastly, job performance is valuable since it communicates the importance of interpersonal strengths use through a easily understandable outcome and is a valued organizational outcome. Finally, we designed an intervention to specifically stimulate interpersonal strength use. To summarize, the current study starts with conceptualizing interpersonal strengths use, followed by stimulating interpersonal strengths use with intervention to examine the effects on the dependent variables (i.e., strengths use, relational energy, and job performance). Therefore the three main research questions are:

- **RQ1:** What is interpersonal strengths use?
- **RQ2:** Can we stimulate interpersonal strengths use with an intervention?
- **RQ3:** Does interpersonal strengths use mediate between the intervention and the dependent variables strengths use, relational energy and job performance ?

The current study adds insights into the value of interpersonal strengths use, thereby adding complexity and novel insights to what we already know about individual strength use. On an individual level, strengths use refers to using your character strengths in your job and much research is available about it's positive effects on well-being and work-engagement (Quinlan et al., 2012; Van Woerkom et al., 2016; Miglianico et al., 2020). For the academic introduction of interpersonal strengths use, we build upon individual strengths use and expand that to the interpersonal level. After conceptualizing interpersonal strengths use, we propose different effects for the two participants of the dyad. The status quo on interpersonal strengths use research is indirectly acknowledging the possible existence, therefore our theoretical contribution is an *actual* introduction and research. The research gap could be due to the strong focus on individual research and the complexity of dyadic data analysis

(Krasikova and LeBreton, 2012). Some studies recognized the relevance of interpersonal effects on strengths use, however, they mean what the effects of interpersonal relations are on individual strengths use (Moore et al., 2021b). The current study does not examine the effects of interpersonal relations on strengths use, but we examine interpersonal strengths use as a dyadic pro-active working strategy. Then we research how interpersonal strengths use affects the dependent variables (i.e., strengths use, relational energy and job performance).

Next, a quasi-experimental study design is adopted, thereby showing the causality of the effects of interpersonal strengths use on the dependent variables (Grant and Wall, 2009). Thus the theoretical contribution is that by stimulating specifically interpersonal strengths use, we can also establish the causal effects of interpersonal strengths use on the strengths use, relational energy, and job performance. By establishing the causality of interpersonal strengths use on the dependent variables, we provide a new tool for stimulating them: namely through the interpersonal strengths use intervention. Further, Krasikova and LeBreton (2012) concluded that many studies aiming to understand interpersonal mechanisms use inappropriate analysis methods, we aim to prevent this by adopting the social relations model (Snijders and Kenny, 1999) to obtain meaningful results.

The relevance for the research field of Operations Management & Logistics (OML) is that organizations value fostering work-relations and collaboration to prevent adverse organizational outcomes (Frangi et al., 2021; De Lucas Ancillo et al., 2021), interpersonal strengths use might prove to be a means to achieve those organizational goals. The practical contribution is the interpersonal strengths use intervention since it provides organizations with a practical method to stimulate and support interpersonal strengths. They also benefit from the potential effects on strengths use, relational energy, and job performance. Therefore the value of interpersonal can be linked to organizational success through employees, the human component, making it inarguably influential and exciting. The OML research field is supported by understanding how to enhance operations management through the organization's employees.

We wanted to conduct the current study in an organizational context, therefore Ordina was invited to participate. Ordina is an IT consultancy firm and values the insights of the current study as they realize how many interpersonal collaborations between their employees occur. Ordina has participated in our preliminary study and greatly values energizing their teams through dyadic collaborations. Additionally, they believe in the benefits of further stimulating interpersonal strengths use, thereby potentially stimulating strengths use, relational energy, and job performance. They are excited about the intervention since it offers their employees opportunities for self-development and potentially heightened well-being.

To summarize, we adopt a quasi-experimental study design to explore the effects of the newly introduced interpersonal strengths use on strengths use, relational energy, and job performance whereby the interpersonal strengths use intervention serves as the treatment. The current study is valuable for Ordina, which we further explain in chapter 2. Following the company description, the theoretical background in chapter 3 describes what we know about strengths use and introduces interpersonal strengths use. Further, we examine what we theoretically know about strengths interventions and propose an interpersonal strengths use intervention. Lastly, we propose the effects of interpersonal strengths use on the multiple dependent variables (i.e., strengths use, relational energy, and job performance). The

chapter ends with a theoretical model (figure 8), which summarized the hypotheses by depicting the effects of interpersonal strengths use. Next, chapter 4 explains how we executed the quasi-experimental design, what we measured and how we conducted the analysis. In addition, we theoretically explain the design choices for the intervention. Then chapter 5 contains the results and summarizes the findings in the last subsection. Finally, we present the discussion in chapter 6, including the theoretical contributions, practical contributions, limitations, future research directions, and conclusion.

2 Company description

Ordina is an IT consultancy firm active in the Benelux, generating revenue by providing IT services for digital acceleration, business platforms, cybersecurity, and data-driven challenges. In 2020 Ordina had revenue of 369.2 million euros with a net profit of 22.3 million euros (Ordina, 2022). We retrieved all information in this chapter from Ordina (Ordina, 2022). For most of the clients, Ordina delivers value through high-performance teams. Therefore Ordina spends a lot of time composing, training, and maintaining their teams. More specifically, they continue creating workshops and training programs to facilitate their high-performance teams. This is why Ordina is good match for this study, since the current study contributes to developing and giving a new training.

Core values The core values of Ordina are: discover, connect and accelerate. With 'discover,' they demonstrate their interest in developing themselves and innovating within their discipline to stay 'Ahead of change' (this is also their motto). The 'connect' value represents that they value an open and inclusive working environment, for instance, in their high-performance teams. Lastly, the 'accelerate' value shows that they want to provide high-quality service to their clients as fast and efficiently as possible.

Business propositions and clients The hierarchical nature of Ordina is semi-flat, and the organizational structure enables realizing the five business propositions. The management board of Ordina consists of their CEO, Jo Maes and CFO Joyce van Donk-Van Wijnen, and the supervisory board supervises the management board. At the end of 2021, the average number of employees was 2583, and with 170 high-performance teams, approximately 1600 employees work in high-performance teams.

These propositions are high-performance teams, digital acceleration, intelligent data-driven organizations, business platforms and security & compliance.

Their clients come from three primary industries: the public sector, financial services, and industry. For example ProRail, a high-performance team developed a Mendix application specially designed for ProRail: Plandix. Plandix is a digitized planning tool helping ProRail to work more efficiently and use new possibilities. Another example is in the theme of digital acceleration, Ordina realized making-commerce platform for Blokker. This renewed platform complements their physical stores and makes Blokker ready for an online retail future, the platform currently aids in boosting their effectiveness. Thirdly, for NN insurance, Ordina provided their service within the business proposition of intelligent data-driven organizations. Ordina helped Nationale-Nederlanden (NN) to visualize all their data, contributing to increased client satisfaction. Lastly, Ordina realized business platforms & the cloud for Advanced Power Solutions (APS). APS is one of the biggest customer battery suppliers in Europe. Ordina assisted them with switching to SAP, a program that assists big organizations with effectively organizing business processes.

High-Performance teams In the semi-flat hierarchical structure, the high-performance are at the bottom of the hierarchy. Figure 4 shows whom Ordina wants to create value for and what strategic pillars assist in creating that value. The high-performance teams are one of the five business propositions of Ordina. High-performance teams are part of the strategic pillar of digital business partner. Specifically, this business proposition grew enormously last year, going from around 100 teams at the end of 2020 to nearly 170 teams at the end of 2021. With this growth, the high-performance team's revenue has also grown.

Due to the high-performance team, last year's revenue from the public sector grew by 8.2% (making it 163.9 million euros in 2021) and revenue from the financial sector grew by 5.2% (making it 103.7 million euros in 2021). Thus, high-performance teams are popular among clients of Ordina and generate significant revenue growth.



Figure 4: The strategic pillars of Ordina

Ordina strongly believes that their high-performance teams contribute to heightened customer satisfaction, are of high quality, have a high problem-solving capacity, have a heightened efficiency, are performance-driven, and are agile. Due to the multidisciplinary background and adoption of scrum as their working method, high-performance teams achieve their goals. Scrum is an IT method where teams work in short cycles toward a specific goal. At the end of the cycle, a brief reflection and evaluation of the progress and goals of the consequent cycle are determined. In this way, the progress of the high-performance team and the client's objectives continue to be aligned, optimizing the team's performance.

Ordina & Current study Why are Ordina and the current study a match? For two reasons: the preliminary study was already conducted at Ordina and Ordina greatly values energizing their teams through collaborations. The preliminary study was my Bachelor's thesis and provided direction for the current study, also, Ordina is acquainted with the type of research and therefore highly cooperative. Further, the current study offers a new training aimed at interpersonal strengths use and Ordina is always innovating and improving their training for their high-performance teams. The aim is that the intervention will be valuable for developing interpersonal collaborations within the High-performance teams, individuals from 9 of the 170 high-performance teams will participate in the current study. Especially since Ordina is going through a reorganization, many people have to collaborate with new colleagues, for these situations, the intervention focusing on interpersonal relations is extra valuable. This intervention aims to assist with getting (better) acquainted with each other and becoming aware of how to collaborate while enhancing each other's well-being.

3 Theoretical background & model

Every section of this chapter provides the theoretical background for one research question, the final section visualizes the proposed relations. The first section answers RQ1 by summarizing what is known about strengths and strengths use, finishing with the introduction of interpersonal strengths use. The second section summarizes what we know about strengths use intervention and proposes how an interpersonal strengths use intervention might affect interpersonal strengths use. Thereby we lay a foundation for answering RQ2, however, only after analyzing the results can we conclude whether we created an effective interpersonal strengths use intervention. The third section proposes how interpersonal strengths use mediates between the interpersonal strengths use intervention and strengths use, relational energy, and job performance. Afterward, we answer RQ3 by testing the proposed hypotheses. This chapter concludes with the visualized theoretical model, comprising all the relations and concepts introduced and explained in the first three sections.

3.1 Introduction Interpersonal strengths use

This section aims to answer **RQ1** by reviewing what we know about strengths, strengths use (on an individual level), and finally introducing interpersonal strengths use (on a dyadic level).

3.1.1 Strengths

Before jumping to strengths use, we clarify what strengths are since three streams about the definition of strengths were identified (Miglianico et al., 2020). Firstly, Buckingham et al. (2001) define strengths as: 'consistent near-perfect performance in an activity'. Clifton and Harter (2003) showed that focusing on strengths is more effective than working on your weaknesses. Following this start, Peterson et al. (2004) define character strengths as: 'the psychological ingredients—processes or mechanisms—that define the virtues' (Peterson et al., 2004). Thus, using your strengths, you can show your virtues. Therefore, their book connected virtues to strengths and classified character strengths based on six main virtues: wisdom, courage, humanity, justice, temperance, and transcendence (Peterson et al., 2004). Thirdly, Linley (2008) recognized that strengths are energizing and important for development and individual performance. Therefore strengths were defined as: 'preexisting capacity for a particular way of behaving, thinking, or feeling that is authentic and energizing to the user, and enables optimal functioning, development, and performance' (Linley, 2008).

The three streams have common ground, the reoccurring aspects are: strengths are naturally present, energizing when used, and positive for individual performance (Miglianico et al., 2020). Since this last definition of strengths focuses more on relevant outcomes for organizations, such as relational energy and individual performance, the strengths use articles based on or inspired by Linley (2008) will be used in this study.

Besides theoretical definitions, Moore et al. (2021b) proposed a list of 22 strengths categories valuable in the workplace, after an extensive qualitative and quantitative study. Examples are courage, helpfulness, and serenity, the full list with definitions is in Appendix A Figure 13. The identification and explanation of strengths valuable in the workplace is practically valuable because we will conduct the current study in an organizational setting as well. To the best of our knowledge, no other list exists that put together strengths in an organizational context.

3.1.2 Individual level strengths use

Following the introduction of strengths, *strengths use* is defined in distinct ways as well (Miglianico et al., 2020). This study builds on the description for strengths use as summarized by Van Woerkom et al. (2016): "*An individual has specific individual characteristics traits abilities that when engaged, are energizing and allow them to perform at his or her personal best.*" Van Woerkom et al. (2016) based this on the combination of multiple definitions and aspects of strengths use. Namely the combination by Linley and Harrington (2006) and Wood et al. (2011), whereby the school of thought by Linley is dominant. Since the definition by Van Woerkom et al. (2016) captures all identified aspects of strengths use, and to be clear and complete, we adhere to this definition when referring to strengths use in this study.

However straightforward it sounds to use your strengths, it can be challenging to use them when you are unaware of them. Individuals cannot use their strengths because they are often unaware of them (Buckingham et al., 2001; Govindji and Linley, 2007; Wood et al., 2011; Van Woerkom et al., 2016). A precondition of strengths use is knowing your own strengths, as strengths knowledge and strengths use are significantly correlated (Govindji and Linley, 2007). So, to overcome the challenge of using their strengths, individuals should start with identifying their own strengths (Govindji and Linley, 2007).

After identifying strengths, stimulating strengths use is valuable for the positive effects on well-being (Govindji and Linley, 2007; Miglianico et al., 2020; Ghielen et al., 2018; Quinlan et al., 2012). Both well-being and work-related well-being were positively affected. Examples of work-related well-being affected by strengths use are work engagement, productivity, and lower burnout (Cable et al., 2013, 2015) and examples of well-being are depression and life satisfaction (Ghielen et al., 2018). Strengths use positively affects well-being through the positive-activity model (Lyubomirsky and Layous, 2013). Lyubomirsky and Layous (2013) propose with their model that well-being is positively affected when a positive activity increases positive emotions, thoughts, behaviors, and needs satisfaction. Using your strengths is seen as a positive activity (Seligman et al., 2005). Thus the positive activity model offers an insight into the mechanism behind the effects of strengths use on well-being. Furthermore, higher strengths use is valuable since strengths-based job crafting positively affects employee creativity (Yang et al., 2021; Kooij et al., 2017). Strengths-based job crafting is 'the self-initiated changes within the work constraints to better use their strengths' (Yang et al., 2021). Yang et al. (2021) showed that strengths-based job crafting positively influenced job self-efficacy. This high self-efficacy gave individuals more confidence to present their novel ideas, which positively influenced employee creativity (Yang et al., 2021).

Lastly, Dubreuil et al. (2014) showed that strengths use and job performance are positively associated, thereby confirming previous findings (Hodges and Clifton, 2004; Hodges and Asplund, 2010; Asplund and Blacksmith, 2012), however, it remains unknown through which pathway. Multiple studies examined proposed possible pathways, yet we are still determining how strengths use affects job performance. Firstly, Dubreuil et al. (2014) showed that concentration, subjective vitality, and harmonious passion were mediators between strengths use and job performance. However, due to the study's cross-sectional design, no causality can be concluded from the results. Secondly, Van Wingerden and Van der Stoep (2018) showed that experiencing your work as meaningful stimulates strengths use, and in turn increases job performance. However, they do not propose the process between the effects of strengths use on job performance. Thirdly, Tisu et al. (2021) proposes that strengths use moderates the relation between job resources and job performance. They do

not propose specific mechanisms behind the relationship between strengths use and job performance. Fourthly, another proposed pathway is by (Dubreuil et al., 2021), who propose two pathways to enhance job performance: that strengths use boosts positive emotions and reduces negative emotions. These four examples of how strengths use might affect job performance have divergent ideas, in some, strengths use is a moderator and in others, a predictor. Additionally, most still need to go deeper into the actual process behind the effects of strengths use on job performance. Indeed, it is still being determined how the effects of strengths use result in higher job performance (Dubreuil et al., 2021; Bakker and van Woerkom, 2018; Ghielen et al., 2018).

To summarize, we clarified the definition of strengths use, addressed challenges in using strengths and discussed the positive effects of strengths use on well-being, employee creativity, and individual job performance. Looking beyond strengths use and its positive effects, modern work settings rely increasingly on collaborations between employees rather than individual employees (Boyatzis and Rochford, 2020). Some researchers have proposed the extension of strengths use to group level and proposed positive effects on individual job performance as well (Van Woerkom et al., 2020). They propose seeing strengths use as a team resource that will relate to higher team performance because they can collectively use the diverse strengths (Van Woerkom et al., 2020). However, empirical support is yet to be acquired. Taking this all into consideration: what if we could stimulate employees who collaborate but are not necessarily in a team to use each other's strengths? Instead of relying on individuals to only use their own strengths, what if they can attain the positive effects of strengths use through collaborations? The following section introduces the concept of strengths use on an interpersonal level.

3.1.3 Interpersonal strengths use

After learning about strengths and strengths use, we define interpersonal strengths use. When translating strengths use on an interpersonal level, we build on the before-mentioned definition by Van Woerkom et al. (2016) of (individual) strengths use. Interpersonal strengths use, for which we elevate strengths use to dyadic level, is : *"An individual (actor) interacts with another individual (partner) to use the strengths of the partner, this partner has specific individual characteristics traits, and abilities that when engaged, are energizing."* The visualization in Figure 5 shows what interpersonal strengths use is, for example, an actor uses the strength inventiveness of a partner, inventiveness is one of the strengths of the partner, and the actor has other strengths.

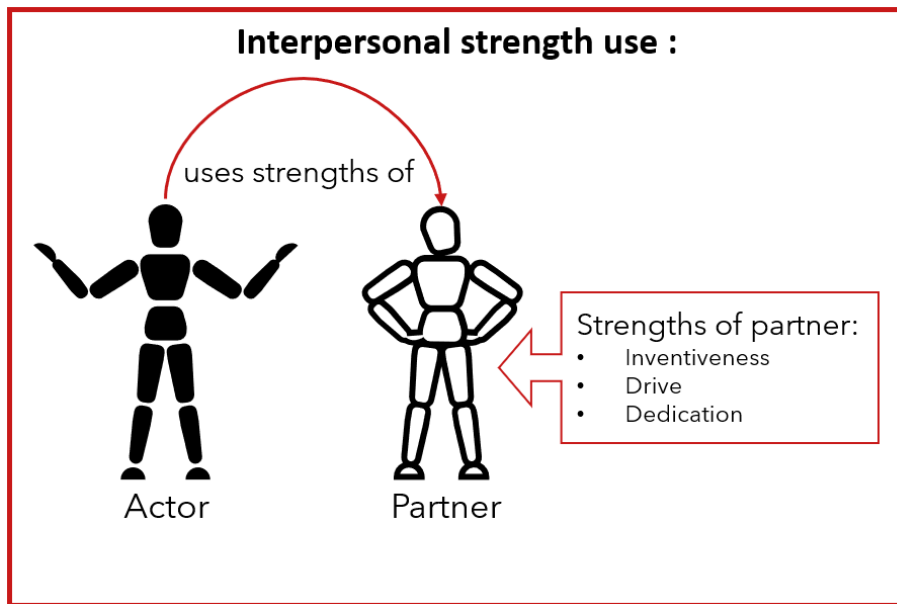


Figure 5: Visualisation interpersonal strengths use

The difference between interpersonal strengths use and (individual) strengths use is the number of individuals involved and the target of who is using their strengths. Strengths use only requires one individual to use his own strengths, however, for interpersonal strengths use, two individuals are required. The emphasis on the requirement of two people lies in the first part of the definition of interpersonal strengths use. So, interpersonal strengths use is a proactive strategy in which an actor tries to activate a partner to use their strength. Thus when mentioning the actor, we refer to the individual who used the strengths of another individual (i.e. the partner). Further, the target of who is using their strength is different since the partner uses his strengths for interpersonal strengths, while the actor uses his own strengths for individual strengths use.

Interpersonal strengths use involves two individuals, therefore, we have to consider the possibility that they are affected differently through distinct psychological processes. Since the effects of strengths use on an individual level are positive, it stands to reason that there will be positive effects on a dyadic level as well. However, it is unclear whether both individuals of the dyad experience the same (positive) effects and whether the effects are through the same psychological process. So, we do not know how the actor and partner are affected, but in the next paragraph, we explain how we can find out.

A dyadic analysis is required to understand how interpersonal strengths use is perceived by the actor and partner on a dyadic level. Knight and Humphrey (2019) concluded that only dyadic analysis enables researchers to determine how interpersonal constructs work: is the interaction influential, depends on the actor, or is the partner decisive for the outcomes? Based on the outcome of this analysis, we can understand how interpersonal strengths use affects both individuals. For example, Eisenkraft and Elfenbein (2010) showed that during interactions, different emotions could be experienced differently by the actor and partner, depending on the type of emotion. Their study showed that people who evoke positive emotions in others were more popular than those who evoke negative emotions. So if some individual aims to become more popular, eliciting positive emotions in others is more helpful than eliciting negative emotions. Similarly, the current study aims to understand how strengths use operates on a dyadic level and provides insights for organizations regarding

valuable outcomes.

The reason that interpersonal strengths use is unstudied so far is unknown, research so far has focused on individual strengths use and recently made the call to study interpersonal relations effects. To the best of our knowledge, all strengths use studies focused on effects on individual-level outcomes, while multiple researchers have called for the interpersonal side of strengths use (Moore et al., 2021a; Bakker and van Woerkom, 2018; Biswas-Diener et al., 2011). The interpersonal side means the effects of interpersonal relations, interactions, and recognition on individual strengths use. Thus interpersonal strengths use as an interpersonal pro-active resource-based strategy was unidentified, the reason could be a combination of focusing only on an individual level and the difficulty of dyadic analysis. As was concluded by Krasikova and LeBreton (2012), many dyadic studies in all fields prove to be complex and challenging to conduct the analysis faultlessly. Alternatively, it is possible that no one realized that it did not exist in the scientific literature because the idea of using interpersonal strengths is so intuitive and natural. Either way, we argue that it is promising, and we will examine the effects of interpersonal strengths use.

3.1.4 Constructs that are *not* interpersonal strengths use

The strategy to approach specific people for specific tasks might seem like constructs that already exist, however, these are different from interpersonal strengths use. In this section, we examine the seemingly similar constructs transactive memory systems (Lewis, 2003), shared (team) mental models (Lungeanu et al., 2022) and sharing knowledge (Johnson et al., 2006). These are different from interpersonal strengths use in two ways: they do not focus on using another individual's *character strengths* and are not on a dyadic level but a team level. Interpersonal strengths use specifically builds on the strengths of other individuals, not on their skills or cognitive knowledge. Additionally, the dyadic nature of interpersonal strengths use enables application outside of teams, thus interpersonal strengths use can be applied throughout organizational networks. Furthermore,

Firstly, a transactive memory system (TMS) is: 'a set of information possessed by each member of a group combined with a shared awareness of who knows what within the group' (Wegner et al., 1985). However, this focuses on team information and not on strengths. Bakker and van Woerkom (2018) proposed elevating strengths use to the team level by combining strengths use with TMS. They propose that it could enhance job performance by using your own strengths in your work while also being able to use the strengths of the other individuals from the group (Bakker and van Woerkom, 2018). So, they propose that TMS is a contributing mechanism for using others' strengths in teams, but the ideas still need to be developed, and they focus on teams rather than dyads.

Secondly, Converse et al. (1993) define shared team mental models (SMM) as: 'knowledge structures held by members of a team that enable them to form accurate explanations and expectations for the task and, in turn, to coordinate their actions and adapt their behavior to the demands of the task and other team members. SMM are essential for coordinating teamwork (DeChurch and Mesmer-Magnus, 2010; DeChurch et al., 2015), and the overlap is that individuals must build on one another for both shared mental models and interpersonal strengths. However, SMM relies on team characteristics and does not focus on character strengths, therefore it is different from interpersonal strengths use.

Thirdly, Johnson et al. (2006) defined information sharing as: 'the degree to which team members share information with each other'. Mesmer-Magnus and DeChurch (2009) showed that information sharing is a predictor of team performance, making it valuable for organizations with teams. Nevertheless, we arrive at the same conclusion as for TMS and SMM,

information sharing is on the team level, while interpersonal strengths use focuses on the dyad level.

The three discussed concepts are on a team level and team mechanics differ from dyadic mechanics, therefore team concepts and dyadic concepts should not be used and seen interchangeably. Moreland (2010) argues that dyads can be formed and forgotten more easily than teams and experience more intense and diverse emotions in dyads than in teams. Besides, team phenomena can only happen in teams simply because dyads are too small (e.g., group composition, group dynamics like conflicts) (Moreland, 2010). Lastly, and most compelling, the dyadic research field uses different theories and methods compared to team research fields making comparison hard between dyadic and team research (Moreland, 2010).

Thus all three constructs that might come to mind while reading about interpersonal strengths use are within a team setting, while interpersonal strengths use is not on a team but dyadic level. Moreover, the three constructs focus on their team members' cognitive resources (content-related knowledge and information) rather than using another individual's character strengths. Thus, interpersonal strengths use is indeed a new concept and, therefore, valuable to explore.

3.2 Interpersonal strengths use intervention

This section provides a theoretical background for **RQ2** by examining strengths use interventions to understand how we can stimulate interpersonal strengths use with an intervention. This section summarises the mechanism through which strengths use interventions work, what literature is available about the conditions, and the effectiveness of strengths use interventions. After that, we will propose how an interpersonal strengths use intervention (on a dyadic level) could be created based on the strengths use interventions (on an individual level).

Strengths use interventions Even though multiple strengths use interventions have been designed and conducted, only six studies examined the mechanisms through which these strengths use interventions operate (Ghielen et al., 2018). The content of these interventions was to do exercises to identify your strengths (like lost-at sea (Cable et al., 2013) or best-self episode reflection (Cable et al., 2015; Lee et al., 2016)) and some interventions went on to keep a reflective learning diary (Meyers et al., 2015). Ghielen et al. (2018) also adhere to the definition of strengths by Linley and Harrington (2006): 'a natural capacity for behaving, thinking, or feeling in a way that allows optimal functioning and job performance in the pursuit of valued outcomes. Rather than focusing solely on the outcomes of the strengths interventions, which were mainly positively and significantly related to well-being and self-efficacy (Quinlan et al., 2012), Ghielen et al. (2018) examined the mediators and mechanisms through which strengths use interventions work. Ghielen et al. (2018) showed that the six studies used a mediator introduced by the positive-activity model of Lyubomirsky and Layous (2013): positive emotions, positive thoughts, positive behavior, and need satisfaction. As was previously explained in the strengths use section, the positive activity explains how strengths use, and strengths use intervention positively affect well-being. These four mediated between the effects of the strengths use interventions and different outcome variables, and the significance varied depending on the studied outcome variables (Ghielen et al., 2018).

The effectiveness of strengths use is influenced by strengths knowledge and what partic-

ipants believe about themselves. Multiple studies showed that people are often unaware of their own strengths (Buckingham et al., 2001; Govindji and Linley, 2007; Wood et al., 2011; Van Woerkom et al., 2016). So when strengths use is trained, individuals should start identifying their own strengths (Govindji and Linley, 2007). On the other hand, if participants already know their strengths, it matters what participants believe about their strengths for the intervention to be effective. Proyer et al. (2015) showed that participants who already believed they had five signature strengths benefited less from the strengths intervention that stimulated strengths use. Van Woerkom and Meyers (2019) found comparable effects, namely, participants with lower self-efficacy benefited more from strengths use interventions than participants with higher levels of self-efficacy. Thus, knowledge and beliefs about their strengths are essential for the outcome of the strengths-use interventions. Lastly, the effectiveness of strengths use interventions is non-significantly affected by the type of intervention and gender. To start, Ghielen et al. (2018) showed that most strengths use interventions positively affect well-being and the dependent variables. They conclude that the consistent positive effects on well-being show that the type of intervention unlikely influences intervention outcomes. Furthermore, intervention studies have repeatedly controlled for gender as a moderator for the effects of the intervention but found no significant effects (Gander et al., 2013; Quinlan et al., 2015).

To conclude, by understanding the mechanisms behind strengths use interventions and the conditions required for significant positive effects, we can continue exploring the effects of an interpersonal strengths use intervention.

Interpersonal strengths use intervention Just like strengths use intervention results in higher levels of strengths use (Forest et al., 2012; Littman-Ovadia et al., 2014; Quinlan et al., 2015; Bakker and van Wingerden, 2021), the intention behind an interpersonal strengths use intervention is increasing levels of interpersonal strengths use. Therefore the expected effect of the intervention is straightforward: we propose that the intervention directly stimulates actor interpersonal strengths use.

To start, while designing the interpersonal strengths use intervention, strengths use interventions can be used as a foundation with the addition of an interpersonal perspective. Foremost, actor interpersonal strengths use is stimulated by encouraging actors to seek out partners' strengths during the interpersonal strengths use intervention. Individual strengths use intervention (almost) always start with participants identifying their *own* strengths (Louis, 2011; Duan et al., 2014; Harzer and Ruch, 2016; Toback et al., 2016; Meyers and van Woerkom, 2017). Therefore we propose following with the identification of strengths of *other* participants after identifying their own strengths. Thereby it becomes practically feasible and more accessible for actors to use the strengths of other individuals since they recognize the strengths of other individuals. Finally, as part of the intervention, the participants will be stimulated to actively draw on the strengths of the other participants during a week. Therefore a direct increase in actor interpersonal strengths use is expected as an effect of the interpersonal strengths use intervention, and it is hypothesized that

Hypothesis 1: On a dyadic level, the interpersonal strengths use intervention positively affects actor interpersonal strengths use.

3.3 Effects of interpersonal strengths use on strengths use, relational energy and job performance

To answer **RQ3**, we use a quasi-experimental design to theoretically examine the effects of interpersonal strengths use on strengths use, relational energy, and job performance (dependent variables) and construct hypotheses taking the experimental design into account. We will describe the rationale for how interpersonal strength use will affect strengths use, relational energy, and job performance. Thus the hypothesis formulation follows the structure of the effect of the intervention on the dependent variable, mediated by interpersonal strengths use.

Explaining the effects of interpersonal strengths use in terms of actor and partner may be abstract. Therefore, to ease understanding of the theory toward the following four hypotheses, we want to introduce a duo: Tom & Jerry. Using this iconic pair, every relation and effect will be less abstract. Say Tom is the actor whose strengths are: communication and coordination, and Jerry is the partner with the strengths: inventiveness, drive, and dedication. Using these concrete individuals with specific strengths, it becomes easier to convey the effects of interpersonal strengths use, how Tom (actor) experienced the interaction, and how Jerry (partner) experienced it. Figure 6 depicts the Tom& Jerry example.

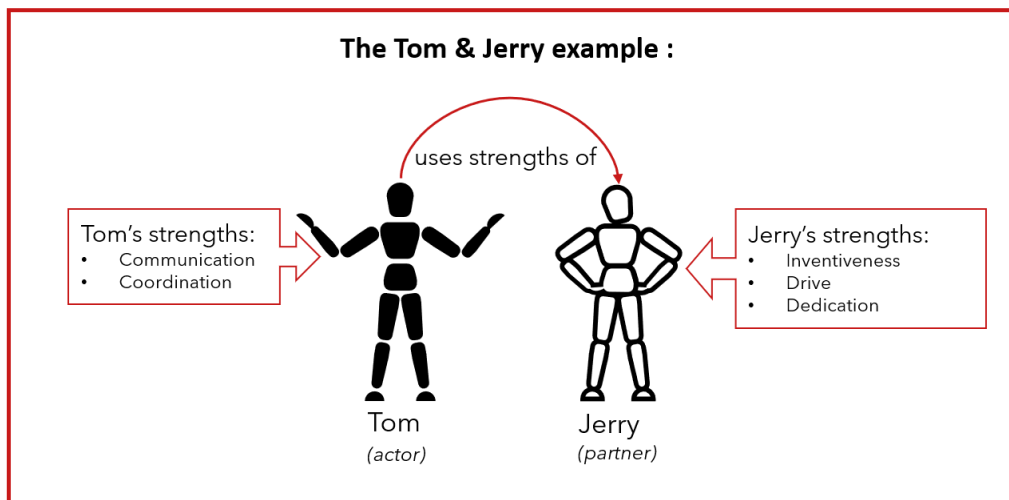


Figure 6: The Tom & Jerry example of interpersonal strengths use

3.3.1 Effects interpersonal strengths use on strengths use

We propose that actor interpersonal strengths use affects partner strengths use since the actor aims to use the strengths of the partner (through interpersonal strengths use). Remember that Tom has the strengths of communication and coordination, and Jerry has inventiveness, drive, and dedication. Tom has to develop a creative solution for a problem he has been struggling with for a week, but then he realizes that Jerry has a strength: inventiveness. Tom approaches Jerry. Jerry indeed comes up with a creative solution in little time, enjoying coming up with it since he is good at it, and it is a solution that Tom had not thought of yet. Now, because the actor (Tom) reached out to the partner (Jerry) to use the strength of the partner, we refer to this as *actor* interpersonal strengths use. If the actor is then successful by asking Jerry for the correct strength, namely inventiveness, a direct consequence would be an increase of *partner* strengths use.

Altogether we hypothesize that:

Hypothesis 2: On a dyadic level, the interpersonal strengths use intervention indirectly positively impacts partner strengths use through actor interpersonal strengths use.

3.3.2 Effects interpersonal strengths use on relation energy

We propose that (actor) interpersonal strengths use is energizing because of its connection with the self-determination theory (Ryan and Deci, 2000), which is likely to affect well-being positively. In line with the self-determination theory, the basic psychological needs are: competence, autonomy, and relatedness, satisfying these needs contribute to heightened feelings of well-being (Ryan and Deci, 2000). By stimulating interpersonal strengths use, we satisfy the three basic psychological needs: competence, autonomy, and relatedness. Competence is satisfied by giving individuals a method to use other people's strengths. Through the intervention, autonomy is satisfied by giving individuals the power to choose whose strengths they want to use. Relatedness is inherently satisfied by connecting with others. So, because the three needs are satisfied as posed by the self-determination theory, stimulating interpersonal strengths use will probably positively affect employee well-being. Since relational energy is directly associated with well-being (Baker, 2019), we examine the effects of interpersonal strengths use on relational energy. Before we dive into the hypothesis, we examine what relational energy is, what literature is available about it and why it is relevant to our study. Then we hypothesize the effects of actor interpersonal strengths use on actor and partner relational energy.

Relational energy is a form of energy transferred through dyadic interactions, the theory behind this transference lies in the conversation of resources theory, resource caravans, and resource passageways. Relational energy is defined by Owens et al. (2016) as: 'a heightened level of psychological resourcefulness generated from interpersonal interactions that enhance one's capacity to do work'. To emphasize, relational energy is an individual-level concept, but the generation of resources comes from a dyadic interaction. Thus relational energy is usually only measured on a personal level and not with the information from both involved individuals of the interactions. Studies have shown that heightened relation energy results in more psychological resources through the conversation of resources (COR) theory (Owens et al., 2016). Hobfoll (1989) introduced COR as a theory to describe that people tend to retain, protect and build resources such as relational energy and actively secure them by creating social circumstances in support of the conservation of their resources. In addition, people also seek resources such as relational energy since this is a scarce resource (Hobfoll, 2001). Thereby, through COR, it can be concluded that people will seek out resources through social interactions (Owens et al., 2016). Further, Hobfoll et al. (2018) describes resource caravans as: 'resources do not exist individually but travel in packs, or caravans, for both individuals and organizations'. In addition, resource caravan passageways are: 'people's resources exist in ecological conditions that either foster and nurture or limit and block resource creation and sustenance' (Hobfoll et al., 2018). In combination with COR, resource caravans and resource passageways demonstrate the importance of being around other people to access other resources.

The attained psychological resources through COR aid in maintaining work engagement, leading to higher individual job performance (Owens et al., 2016). Besides the energizing social interactions, studies examined de-energizing interactions as well (Gerbası et al., 2015). They classify de-energizing interactions as negative stressors, thereby arguing that

through COR, people can deal with such interactions because of a surplus in resources (Gerbasi et al., 2015). Indeed, in their two studies, they find that de-energizing interactions negatively affect job performance (Gerbası et al., 2015). Additionally, they find that thriving is an effective resource that buffers against de-energizing interactions (Gerbası et al., 2015). Thus by seeking out resources (like thriving or relational energy), people can protect themselves from such costly de-energizing interactions.

We chose to study relational energy to examine the connection between interpersonal strengths use and a well-being-related outcome and relational energy might provide valuable insights. Relational energy is directly associated with well-being (Baker, 2019) and multiple studies argued that well-being can be enhanced through relational energy (Liang et al., 2020; Shulga et al., 2022). Since relational energy is a social resource, and increased resources are good for general well-being, the connection between relational energy and well-being is intuitive as well. Moreover, since interpersonal strengths use is an interpersonal strategy, it is interesting to examine relational energy since this is about the same interaction. In this way, we examine the effects on a well-being related variable and at the same time might find valuable insights into the perceptions about the interaction. These perceptions can further develop our understanding of interpersonal strengths use.

Increasing relational energy is also an effective way of energizing organizational networks. Cross et al. (2003) conducted research to examine the creation of energy in organizations and how to energize organizational networks. In line with Baker (2019), who identified energizing networks, Cross et al. (2003) also based their definition of energy on (Quinn and Dutton, 2005). Quinn and Dutton (2005) define energy as: ' a type of positive affective arousal, which people can experience as emotion — short responses to specific events — or mood — longer-lasting affective states that need not be a response to a specific event. ' Since organizational networks comprise many dyadic connections, energizing dyads with relational energy will eventually energize organizational networks.

To summarize, through dyadic interactions, we can increase relational energy, and organizational networks could benefit from positive effects on job performance. In terms of the Tom & Jerry narrative, we have the following setting for hypotheses 3 and 4. Remember that Tom has the strengths of communication and coordination, and Jerry has inventiveness, drive, and dedication. Tom realized he could use strength inventiveness of Jerry, and indeed Jerry came up with a creative solution in little time. Jerry was maybe doing something else, but since inventiveness is his strength, Jerry could effortlessly come up with a new idea Tom had not considered. Tom is grateful and feels helped, he had been struggling long and now can move on. So, the actor (Tom) used the partner's strength (Jerry), the actor is helped and can move on, and the partner used his strengths. Through a different mechanism for the actor and partner, it is then plausible that they feel energized through this interpersonal strengths use interaction.

Effects on actor relational energy Starting from the perspective of the actor, we propose that actor interpersonal strengths use has a positive effect on actor relational energy through the JD-R model since the actor sought out resources. In line with the JD-R model, the actor sought out job resources, and with a surplus of resources, the actor feels energized (Demerouti et al., 2001). The JD-R model proposed that more resources aid in attaining higher states of job resources which are favorable for the psychological state of an individual. The model contains two main components: job demands and job resources. Job demands are the physical, social, and organizational aspects of a job that require physical or mental effort and therefore have a psychological cost (Demerouti et al., 2001). On the

other hand, job resources are the physical, psychological, social, or organizational aspects of the job that aid a person in achieving professional goals, reducing job demands, and stimulating development (Demerouti et al., 2001). In this case, the actor actively sought out job resources, originating from the social aspect of his job. The partner's strengths might aid the actor in achieving professional goals, reducing job demands, and stimulating development. Thereby the actor might experience the gains from what the partner can provide as a resource. Thus the interaction becomes energizing for the actor. Therefore it is hypothesized that:

Hypothesis 3: On a dyadic level, the interpersonal strengths use intervention indirectly positively impacts actor relational energy through actor interpersonal strengths use.

Effects on partner relational energy From the perspective of the partner, we propose that interpersonal strengths use has a positive effect on the relational energy of the partner through supporting the actor and the effects of strengths use. Multiple studies showed that supporting others has positive psychological effects on the individual providing support (Jerry, the partner) (Wang and Gruenewald, 2019; Zeijen et al., 2020). Moreover, in the current context, the partner specifically uses his strengths. Multiple studies showed that strengths use leads to increased well-being (Wood et al., 2011; Proctor et al., 2011; Gander et al., 2013; Harzer, 2020). As explained in section 3.1, through the positive-activity model (Lyubomirsky and Layous, 2013), strengths use is a positive activity resulting in heightened well-being. Heightened states of well-being originate from energizing activities, for example, Cain et al. (2017) showed how specific work adjustments made work more energizing and contributed to well-being. Actor interpersonal strengths use is the source for the energizing activity partner strengths use. Therefore we hypothesize that:

Hypothesis 4: On a dyadic level, the interpersonal strengths use intervention indirectly positively impacts partner relational energy through actor interpersonal strengths use.

3.3.3 Effects interpersonal strengths use on job performance

We propose that interpersonal strengths use enhances the individual job performance of the actor, also through seeking resources according to the JDR model. Job performance is: 'scalable actions, behavior, and outcomes that employees engage in or bring about that are linked with and contribute to organizational goals' (Viswesvaran and Ones, 2000, p. 216). To emphasize, since this is on an individual level, it is about the actor's general tendency to use the strengths of others (all potential partners) and not about any specific partner. For example, the actor might balance their own shortcomings and be better able to tackle current challenges at work. Then, using the partners' strengths, the actor actively seeks out job resources that contribute to their professional goal, thereby inherently contributing to organizational goals. Bakker et al. (2004) showed that job resources are predictors of individual job performance. So, through the JD-R model, it can be expected that the individual job performance of the actor benefits from interpersonal strengths use. Therefore it is hypothesized that:

Hypothesis 5: On an individual level, the interpersonal strengths use intervention indirectly positively impacts actor job performance through actor interpersonal strengths use.

3.4 Theoretical model visualization

In Figure 7, interpersonal strengths use (as shown in Figure 5) is related to the dependent variables (i.e. actor job performance, partner strengths use, partner relational energy and actor relational energy). However, Figure 7 does not portray the complete hypotheses since the interpersonal strengths use intervention is excluded.

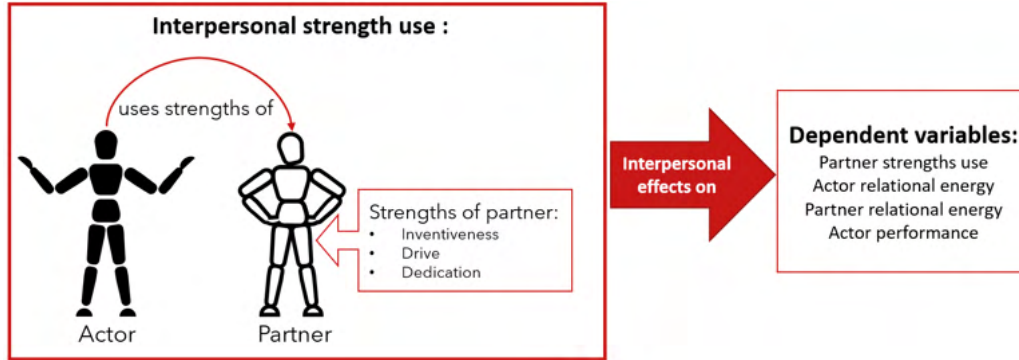


Figure 7: Visualisation interpersonal strengths use and dependent variables

Figure 8 visualizes the proposed hypotheses, it is complete because we added the intervention to what was shown in Figure 7. The independent variable is the intervention interpersonal strengths use, which is expected to influence the dependent variables (i.e. actor job performance, partner strengths use, partner relational energy and actor relational energy) through actor interpersonal strengths use. Thereby actor interpersonal strengths use mediates between the intervention and the dependent variables. Additionally, Figure 8 shows that the dependent variables involve two levels: dyadic level and individual level. To elaborate, we examine actor job performance at the individual level and all other relations and effects at a dyadic level. Although outcomes at other levels are also possible, for instance, at the team level, these are out of the scope of this study.

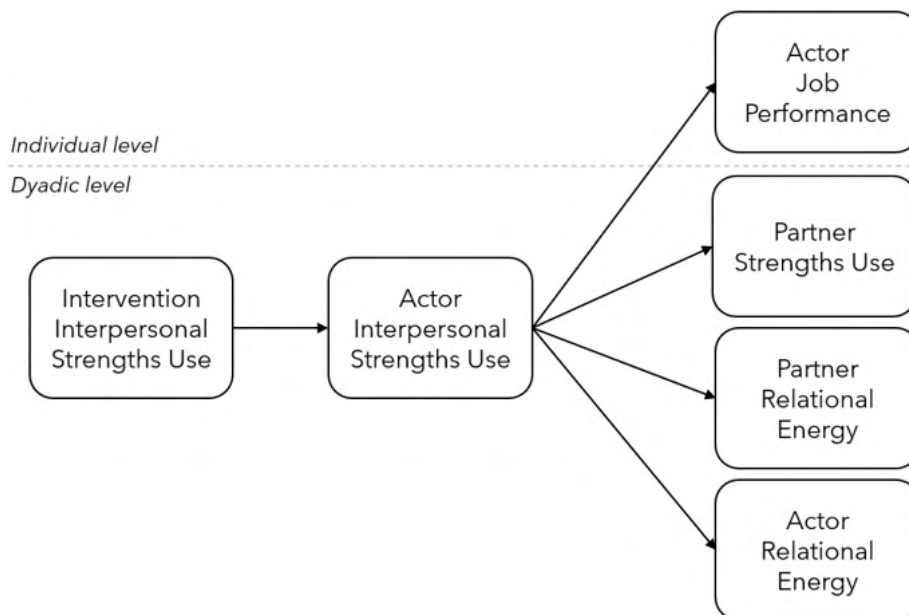


Figure 8: Proposed theoretical model

4 Method

4.1 Study design & Procedure

The overall study design is a quasi-experimental study with an equivalent waiting list control group design. A quasi-experiment is valuable since it strengthens causal inference. Although the control and experiment group assignment is not random, it helps build better theories based on longitudinal data (Grant and Wall, 2009). The overall study consists of three components: pre-intervention survey, intervention, and post-intervention survey. Every participant attended the intervention once, which took approximately three hours, and the total time for completing all surveys was 45 minutes. According to the waiting list design, the intervention was given to the experiment group and not to the control group, as can be seen in Table 1.

Table 1: Waiting-list control design

Design group	T_0		T_1
Design group 1 :	Pre-intervention	Intervention	Post-test 1
Experimental group	measurement		measurement
Design group 2 :	Pre-intervention		Post-intervention
Waiting list control	measurement		measurement

By sending out the survey to both the control and experiment groups, measurements were collected, enabling a causality analysis of the intervention. For ethical reasons, the control group also received the intervention after the post-intervention measurement at T_1 , however, we excluded this data from all analyses. After finishing all quantitative data collection, we conducted a small qualitative post-intervention evaluation with the participants. The study design provides information for the effects of variable intervention interpersonal strengths use on actor interpersonal strengths use of the theoretical model in Figure 8. Additionally, it provides information for the causal effects of interpersonal strengths use on the dependent variables of the theoretical model in Figure 8.

4.2 Interpersonal strengths intervention design

Van Woerkom and Meyers (2019) designed a strengths use intervention, they provided clear design choices and found significant effects of the intervention on strengths use. For the interpersonal strengths use intervention, these same components were the base for designing the intervention while transforming them to an interpersonal level. The workshop slides and worksheet are in Appendix A, we added the worksheet to provide the participants with guidelines for the output of a specific task during the intervention.

Meyers and van Woerkom (2017) identified three main components of a strengths use intervention: identity, develop and use of strengths. The interpersonal strengths use intervention comprises these three elements and is adapted to target actor interpersonal strengths use and partner strengths use. Additionally, we included multiple and different activities to create a higher chance of benefits for the participants (Sin and Lyubomirsky, 2009). Next, we discuss the interpersonal activities comprising each main component.

Identify The intervention started with addressing why the content is relevant for the participants, therefore, the benefits of strengths use will be explained (Sinek, 2009). After this

mini-lecture of ten minutes, the exercises started. Van Woerkom and Meyers (2019) started with identifying strengths using open-ended approaches. Bouskila-Yam and Kluger (2011) described feed-forward interviews (FFI) in six steps, going from identification of strengths to goal setting. The identification steps for the interpersonal strengths intervention were incorporated using the FFI (with a clear format found in the worksheet Appendix A, Figure 12). Next, we asked participants to match their identified strengths with strengths of the Behavioural Index of Occupational strengths (BIOS) Moore et al. (2021b). Using BIOS enabled containing the total number of strengths and eased communication since everyone was talking about the same strengths. This step was finalized by having the participants write down five (or a maximum of six) strengths (on post-its) from the BIOS they felt were theirs. We stuck these post-its on a whiteboard. This component was designed to influence partner strengths use from the theoretical model in Figure 8, but was mainly a prerequisite before individuals could learn about each other’s strengths.

Develop Van Woerkom and Meyers (2019) continued by informing participants about crafting as a method to align strengths and work, and we introduced interpersonal strengths use as a method of crafting. As part of the strengths use intervention, the participants analyzed their tasks and identified where they use their strengths (Van Woerkom and Meyers, 2019). In addition, in the interpersonal strengths intervention, they also identified tasks where they cannot use their own strengths. The tasks where they cannot use their own strengths served as the situational context in which the participants could imagine effective interpersonal strengths use. We included this because formulating situational context makes it more likely that a person will do the thing they intended to do (Dewitte et al., 2003) showed that f. The exercises for this component combined a task analysis and created a situational context, thereby developing interpersonal strengths use.

The next step was finding the (perfect) partner whose strengths could be used for those tasks (where the participant cannot use their own strengths). This was achieved by walking around, using the whiteboard with the strengths per person, and talking with potential partners whose strengths they could use for those tasks. Participants were left free to switch between the mentioned three activities such that they talked with many other participants and found others’ strengths for all their tasks (where they cannot use their own strengths). This component was designed to influence actor interpersonal strengths use from the theoretical model in Figure 8.

Use Lastly, we asked participants to make a plan for the coming week (Van Woerkom and Meyers, 2019). They formulated SMART goals to aid them in realizing their goals of whom to approach for specific tasks (Bushman, 2013). After formulation, they shared their SMART goals with the participants whose strengths they intended to use. Lastly, the participants received motivational and encouraging tips (Bartlett and Mees, 2003). This component was designed to further influence actor interpersonal strengths use from the theoretical model in Figure 8.

4.3 Sample

The sample group comprises 53 people from nine teams for the pre-measurements (T_0). Sixty-five individuals filled out the pre-intervention survey and 61 the post-intervention survey (T_1). In the end, 53 individuals filled out both surveys, using only their measurements enabled the biggest possible sample size while also having dyadic measurements rated by both the actor and partner (which are the directed dyadic ratings). To clarify, one dyad

has two directed dyadic ratings, one from the actor’s perspective (about the partner) and one from the partner’s perspective (about the actor). The individuals filled out surveys formatted according to the round-robin design based on the nine teams, which is how we extracted the dyads (Kluger et al., 2021). A primary reason for the drop in respondents from 65 to 53 is that they received the surveys in May. In this period, there are many holidays and thus many employees were absent. The respondents reported their absence as a reason for not completing the surveys in time.

The final number of directed dyadic ratings for T_0 is $N = 262$ and for T_1 the $N = 256$, so a total $N = 518$. The potential total number of directed dyadic ratings was $N = 652$ if everyone had filled out the surveys at both times. To clarify, this sample includes both the experiment and control group, however, the control group had not participated in the intervention. The full process with these dyadic ratings is visualized in Figure 9.

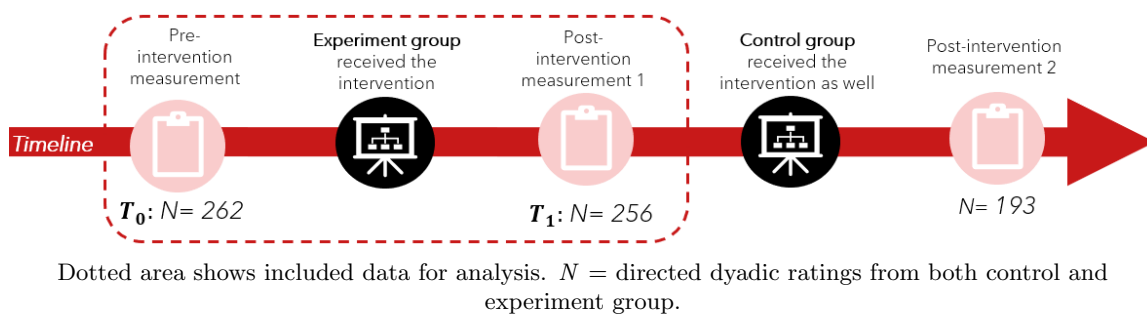


Figure 9: Quasi-experimental design visualization with sample size

Further, the sample consists of 47 (88.7 %) male individuals and 6 (11.3 %) female individuals. The sample contained the following age groups: age group of 18-25 years (7.5%), age group of 25-35 years (35.8%), age group of 35-45 years (18.9%), age group of 45-55 years (22.6%), and age group of 55-65 years (15.1%). The tenure intervals for this sample group are 0-5 years (66.0%), 5-10 years (7.5%), 10-15 years (3.8%), and more than 15 years (22.6%). Finally, the educational level was university (77.4%), vocational (15.1%), and other (7.5%).

4.4 Measures

The pre-and post-intervention surveys contain the same measures on a dyadic level for everyone and there was an additional survey for the team leader about individual performance. The measures for interpersonal strengths use, strengths use, and relational energy were according to the round-robin design. Thus everyone is asked to rate everyone for those three measures. The additional survey for the team leader contains a question about the job performance of all team members, therefore, this is an individual-level other-rated measure. We added the complete survey as Appendix B.

4.4.1 Dyad level

We used the round-robin survey design to obtain (complete) dyadic data (Lashley and Bond Jr, 1997), this design entails that every individual (actor) rates every other person (partner). This way, we obtained ratings from the actor and partner’s perspective for the same dyad. The added value of both perspectives is that it enables the analysis to distinguish between actor and partner effects.

Interpersonal strengths use To measure whether the participant uses other people’s strengths, we adapted questions from a questionnaire with items about strengths use (Govindji and Linley, 2007). We reformulated these to create items asking about strengths use on the interpersonal level. The reformulation resulted in the items: ‘I used the talents of the following people’, ‘I have benefited in my work from the strengths of the following people, and ‘I have used the personal qualities of the following people’ (Van Gool and Sewnarain Sukul, 2022). The possible answers are on a Likert scale from 1 (strongly disagree) to 7 (strongly agree), additionally, it is possible to choose N/A (Not Applicable) if there was no interaction with that person or the name was the name of the person itself. The Cronbach’s α for the pre-measurement (T_0) is 0.88 and post measurement (T_1) is 0.96, indicating high reliability at both times. This measurement provides information for the variable actor interpersonal strengths use on the dyad level for the theoretical model in Figure 8.

Strengths use To measure whether a participant had used their strengths for a specific actor, we adapted those items to a dyadic level (Van Woerkom et al., 2016). An example of such an adapted item is: “When collaborating with the following colleagues, I capitalize on my strengths at work.” The possible answers were on a seven-point frequency scale from 1 (almost never) to 7 (almost always). The Cronbach’s α for the pre-measurement (T_0) is 0.93 and post measurement (T_1) is 0.95, indicating high reliability at both times. This measurement provides information for the variable partner strengths use on the dyad level for the theoretical model in Figure 8.

Relational energy To measure whether the actor had gained relational energy from collaborating with a specific partner, we used a questionnaire with items about relational energy (Owens et al., 2016). Three questions were asked about every other individual. Usually, the measurements for relational energy are only from one perspective, therefore, the dyadic measurement provides a valuable opportunity to study both the actor and partner effects. The possible answers are on a Likert scale from 1 (strongly disagree) to 7 (strongly agree), additionally, it is possible to choose N/A (Not Applicable) if there was no interaction with that person or the name was the name of the person itself. The Cronbach’s α for the pre-measurement (T_0) is 0.90 and post measurement (T_1) is 0.96, indicating high reliability at both times. This measurement provides information for the variables actor relational energy and partner relational energy on the dyadic level for the theoretical model in Figure 8.

4.4.2 Individual level

Job performance The team leader rated individual job performance (AbuBakar and McCann, 2018), team leaders were only asked to rate their subordinates and not themselves. Here 1 represents very bad job performance, and 10 represents excellent job performance (Cooper et al., 2010). We limited job performance ratings to one overall rating, we avoided multiple items measures to prevent the team leaders from an overload of surveys. Since there was only 1 question to measure job performance, there was no calculation for Cronbach’s alpha. This measurement provides information for the variable actor job performance on an individual level for the theoretical model in Figure 8.

4.4.3 Qualitative evaluation of intervention

After giving the intervention, we asked some participants about their experience of the intervention and the surveys to obtain additional insights which we could possibly not capture with surveys. The guiding questions were:

- How did you experience the workshop?
- How did you experience filling out the surveys?
- What other things would you like to tell or report that happened due to intervention?
- Would you repeat this workshop?

4.5 Analysis

First, SPSS was used to extract means, standard deviations, and the correlation table for descriptives. These results must be interpreted cautiously since the non-independence assumption is violated. Multiple measurements are from the same individual and, therefore, not independent. This violation is not an issue for the remainder of the analysis since the following two analysis methods are suited for the data where multiple measurements are from the same individual. We excluded control variables in this study following the decision-making tree (Bernerth and Aguinis, 2016). Following their decision-making tree, we concluded that there is a lack of theoretical rationale to include them, they are unrelated to the variables in the theoretical model, and they were left out (Bernerth and Aguinis, 2016).

To provide input for testing hypotheses one, two, three, and four, we conducted a dyadic data analysis using the social relations model (SRM) (Snijders and Kenny, 1999). Specifically, the SRM allows for analyzing the round-robin data, as it supports analyzing dyads from people of the same group. Since we collected the data from 9 complete teams, this method suits the obtained data. The SRM contains three levels: at the individual level, it contains the actor and partner effects, at the dyadic level, the variance is the result of the actor-partner interaction, and there is a group level (Snijders and Kenny, 1999). The group level will also be part of the output in the results section, however, these are not the unit of interest, and thus we only focus on the results obtained from individual and dyadic levels. Also, the power for group level is too small since we only have $N = 9$ teams.

We converted the collected dyadic round-robin data (for interpersonal strengths use, strengths use, and relational energy) into a pairwise dyadic data set. The pairwise data set was ready for analysis after adding the partner ratings on the row of the actor rating, dummy variables for actors and partners, dyad identifications, and time identifications. Firstly, every row contains the dyadic rating from the perspective of the actor about a specific partner, and thus the rating of that partner about the same actor was added to that row. Secondly, we introduced dummy variables to indicate (per row) which actor and partner are part of the dyad in that specific row. The introduction of dummy variables is a requirement to conduct the SRM analysis (Snijders and Kenny, 1999). Thirdly, due to the round-robin design, the actor and partner roles are also reversed for every dyad, and thus every dyad is present twice. These two dyads receive an identical dyad identification to enable SRM regression. Fourth, time identifications were linked to the dyad identifications to distinguish between pre-intervention and post-intervention measures per dyad.

The prepared pairwise dyadic data set was analyzed using an adaptation of the R-code by

Knight and Humphrey (2019) to conduct the SRM regression over time. The original R-code does not take time into account, therefore it was adapted using the time identification added as the fourth step to the pairwise dyadic data set. Therefore in the results of the random effects of the SRM regression, besides the group, dyad, and individual (separated into actor and partner), time will also be a level of variance. Appendix C contains the adapted R-code, the used regression formula (equation C.1) and sample output. Further, the regression was adapted for testing hypotheses three and four because relational energy was measured once while we wanted to distinguish between actor and partner relational energy. In Appendix D we illustrate what we measured and how we used this in the regression to extract actor and partner relational energy.

The SRM regression was conducted multiple times for the outcome variables while expanding the number of predictors for the fixed effects to build complete models. We build the models with the following steps: model 1 is the null model (without any predictors), model 2 includes only the effects of the intervention, and model 3 contains the added relevant predictors and mediators. Additionally, only for model 1 the social relations model variance decomposition is presented in percentages. For the other models, we did not calculate this decomposition since the study focuses on the regression analysis of the fixed effects. Also, it is usual for other studies to only calculate it for the null model (Joshi and Knight, 2015). Further, for model 2, design group consists of control group (value = 0) and experiment group (value = 1) and time consists of pre-intervention measurement (value = 0) and post-intervention measurement (value = 1). We calculated the intervention effects with design group (DG) \times time (T) since this represents the difference between the control and experiment group across time (Bakker and van Wingerden, 2021; Meyers et al., 2015). Lastly, all the predictor variables in model 3 have been grand mean centered for the interpretation.

To provide input for testing hypothesis 5, a multilevel analysis was conducted on an individual level using the R package 'nlme.' While we collected job performance on an individual level, we collected interpersonal strengths use with dyadic level ratings. Transforming job performance to the dyadic level is inaccurate since (actor) job performance was not rated by the actors and partners (thus not dyadic) but only by one person: the team leader. Thus it was necessary to aggregate interpersonal strengths use to the individual level. Moreover, adhering to the independence assumption of the multilevel model, every individual could only be present once in the data set (per time measurement). Therefore, for every individual, we averaged the values for actor interpersonal strengths use for the pre-intervention and post-intervention measurement. Lastly, we build the models for this multilevel analysis in the same way as the three models for the SRM regressions.

Recall that hypotheses two, three, four, and five are mediation hypotheses, which is why we needed the regression coefficients as input (from the analysis described so far) to use the Monte Carlo method for Assessing Mediation (MCMAM). We used the MCMAM since it is suited for multilevel models (Selig and Preacher, 2008). To clarify, we tested one direct effect (hypothesis 1) and four meditations (hypotheses 2,3,4 and 5). To test hypothesis 1, we used the regression output of the SRM. We used the regression coefficients obtained with the SRM as input for testing the meditations of hypotheses 2,3 and 4. Lastly, for the mediation of hypothesis 5, the regression coefficients obtained with the multilevel model are used. Using the regression coefficients for the mediation analysis, we tested hypotheses 2,3,4 and 5 using the MCMAM.

5 Results

5.1 Descriptive statistics

For reporting the descriptive statistics in Table 2 and the correlations in Table 3 a common challenge was present: all methods for finding descriptive statistics and correlation assume a non-independence of the measurements. The non-independence assumption posed a challenge since the data set contains multiple measurement points from the same individual (i.e., all actors are present in multiple data rows). Thus while reading this subsection's descriptive statistics, continue taking this violation into account. We have included these tables and figures to familiarize the reader with the collected data. However, the analysis methods used for the descriptive statistics are *actually* unsuitable for this type of data.

Table 2 contains the means, standard deviation, and the number of directed dyadic ratings (N) for the four measures of this study: interpersonal strengths use, strengths use, relational energy, and job performance. We categorized the descriptive statistics per design group (control or experiment group) and per time (pre and post-intervention measurement). These measures have not been separated into actor and partner measures since the descriptive statistics are the same for the actor and partner. Appendix E contains the visualisations of the descriptive statistics for the four measured items interpersonal strengths use (figure 20), strengths use (figure 21), relational energy (figure 22), and job performance (figure 23).

Table 2: Descriptive statistics table

Variable	Design group (DG)	Pre-intervention Measurement			Post-intervention Measurement		N
		M	SD	N	M	SD	
Interpersonal strengths use	Control	5.63	0.93	217	5.07	1.2	228
	Experiment	5.62	1.15	276	5.56	0.96	189
Strengths use	Control	5.56	0.84	205	5.27	1.05	234
	Experiment	5.42	1.31	262	5.60	0.94	188
Relational energy	Control	5.42	0.88	222	4.89	1.09	238
	Experiment	5.63	0.92	286	5.41	1.12	189
Job performance	Control	7.13	1.50	15	7.95	1.1	22
	Experiment	8.15	1.01	19	8.16	0.69	19

N refers to the number of directed dyadic ratings.

Table 3 contains the inter-correlation coefficients. As mentioned, the non-independence assumption is violated, therefore the standard error is underestimated, which can (wrongly) result in higher statistical significance than is true. Table 3 includes the Pearson correlations with statistical significance, however, continue to remember that we obtained these values without adhering to the independence assumption.

Table 3: Correlation table

	1	2	3	4	5	6	7	8	9	10
1. Design group (DG)										
2. Time (T)	.01									
3. Intervention (DG x T)	.61**	.53**								
4. Actor interpersonal strengths use	.08	-.26**	-.03							
5. Partner interpersonal strengths use	.06	-.25**	-.04	.06						
6. Actor strengths use	.05	-.13**	.00	.79**	.02					
7. Partner strengths use	.02	-.11*	.01	.01	.81**	.00				
8. Actor relational energy	.128**	-.26**	-.06	.68**	.05	.67**	.05			
9. Partner relational energy	.117**	-.27**	-.06	.06	.68**	.06	.659**	.07		
10. Actor job performance	.19**	.21**	.11*	.02	-.01	-0.03	-.06	-.06	-.07	
11. Partner job performance	.15**	.17**	0.07	-.01	.00	-0.06	-.07	-.08	-.08	.36**

N = 518 (directed dyadic ratings, including both pre and post-intervention measurements of both control and experiment group). ***p* < .01 (2-tailed), **p* < .05 (2-tailed)

5.2 Main analysis

We conducted the main analysis after checking the differences between the control and experiment groups at the pre-intervention measurement (T_0). The differences were non-significant for interpersonal strengths use ($t(7) = 0.011; p = .991$), strengths use ($t(7) = 0.471; p = .652$), relational energy ($t(7) = 1.063; p = .323$) and job performance ($t(5) = 2.127; p = .087$). These statistics establish that the differences found after the intervention are not due to differences in the design group present from the beginning.

To test the five hypotheses, we executed four SRM regressions (for hypotheses 1,2,3,4) and one multilevel model (for hypothesis 5). We included the regression output in tables for actor interpersonal strengths use (table 4), partner strengths use (table 5), actor and partner relational energy (table 6) and actor job performance (table 7). Using the regression coefficient information from these tables, we used the MCMAM to test the mediation hypothesis (for hypotheses 2,3,4 and 5). The results of the MCMAM are summarized in the end, in table 8.

5.2.1 Intervention effects on interpersonal strengths use (SRM)

Table 4: Regression of Actor Interpersonal Strengths Use

	Model 1			Model 2		
	<i>B</i>	SE	<i>p</i>	<i>B</i>	SE	<i>p</i>
Fixed effects						
Intercept	5.49	0.12	.000	5.81	0.17	.000
Design group (DG)				-0.10	0.27	.712
Time (T)				-0.74***	0.10	.000
Intervention (DG x T)				0.39*	0.15	.011
Random effects						
Group	0.00	(0%)		0.00		
Actor	0.66	(46%)		0.66		
Partner	0.03	(2%)		0.02		
Dyad	0.03	(2%)		0.03		
Time	0.71	(50%)		0.62		
Generalized reciprocity	-0.02			-0.01		
Dyadic reciprocity	-0.20			-0.10		
Model fit						
Log-Likelihood	-699.09			-674.03		

Fixed effects contain *B* = unstandardized coefficients and SE= standard error, for random effects variance and covariance parameters are given. For model 1, the social relations model variance decomposition results are included in %. $N = 518$ (directed dyadic ratings, both pre and post-intervention measurements are included). ***, $p < .001$, **, $p < .01$, *, $p < .05$ (two-tailed).

Firstly, for hypothesis 1, we proposed an effect of the intervention on interpersonal strengths use. To test this hypothesis, we used the SRM, Table 4 shows the null model(model 1) and the model including the intervention (model 2). To emphasize, the intervention aimed to stimulate interpersonal strengths use, and checking this effect is the manipulation check of the intervention.

The chi-squared difference test was used, the difference between model 1 and model 2 is significant with $\Delta\chi^2(3, N=518) = 25.06, p < .001$. Thus adding the intervention to the model of actor interpersonal strengths use significantly improves the model.

We included the interaction plot of the intervention effects on interpersonal strengths use in Figure 10.

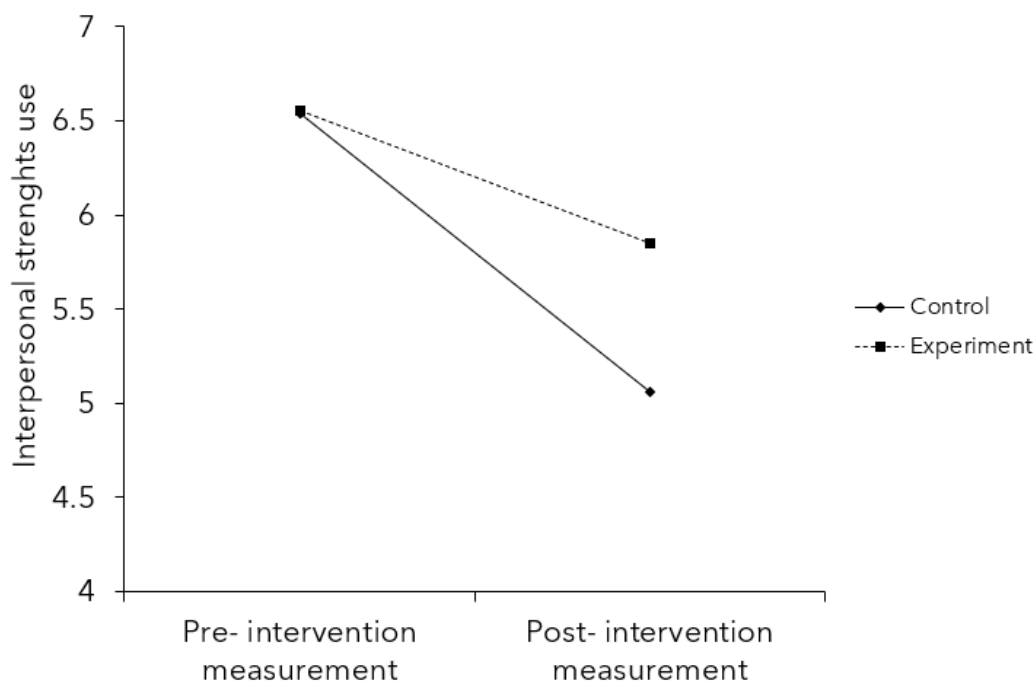


Figure 10: Interaction plot of the intervention effect on interpersonal strengths use

Moreover, as expected, model 2 shows a positive and significant effect of the intervention on interpersonal strengths use ($B = 0.39, p < .05$). This means that those who participated in the intervention reported higher levels of actor interpersonal strength use compared to those in the control group. Thus, with a positive intervention effect, we conclude that the intervention worked as intended by stimulating (actor) interpersonal strengths use. To conclude, we find support for hypothesis 1.

5.2.2 Dependent variable partner strengths use (SRM)

Table 5: Regression of Partner Strengths Use

	<u>Model 1</u>			<u>Model 2</u>			<u>Model 3</u>		
	<i>B</i>	SE	<i>p</i>	<i>B</i>	SE	<i>p</i>	<i>B</i>	SE	<i>p</i>
Fixed effects									
Intercept	5.29	0.21	.000	5.29	0.30	.000	5.30	0.29	.000
Design group (DG)				0.30	0.45	.526	0.27	0.44	.559
Time (T)				-0.40***	0.10	.000	-0.38***	0.10	.000
Intervention (DG x T)				0.37*	0.15	.011	0.36*	0.15	.013
Actor Interpersonal Strengths Use							0.03	0.03	.326
Random effects									
Group	0.26	(16%)		0.28			0.27		
Actor	0.00	(0%)		0.00			0.01		
Partner	0.87	(53%)		0.87			0.88		
Dyad	0.00	(0%)		0.01			0.01		
Time	0.49	(30%)		0.47			0.47		
Generalized reciprocity	-0.04			-0.03			-0.06		
Dyadic reciprocity	-0.17			-0.15			-0.15		
Model fit									
Log-Likelihood	-580.25			-574.05			-576.37		

Fixed effects contain B = unstandardized coefficients and SE = standard error, for random effects variance and covariance parameters are given. For model 1, the social relations model variance decomposition results are included in %. $N = 518$ (directed dyadic ratings, both pre and post-intervention measurements are included). ***, $p < .001$, **, $p < .01$, *, $p < .05$ (two-tailed).

Secondly, for hypothesis 2, we proposed an effect of the intervention on partner strengths use, mediated by actor interpersonal strengths use.

Table 5 shows the three models as was explained in the method. The chi-squared difference test was used, the difference between model 1 and model 2 is non-significant with $\Delta\chi^2(3, N=518) = 6.2, p = .102$. Thus only adding the intervention to partner strengths use had insignificant effects on improving the model. The chi-squared difference test was used and between model 2 and model 3 and was insignificant as well with $\Delta\chi^2(4, N=518) = 2.32, p = .677$. So, adding actor interpersonal strengths use as an additional predictor to model 2 is not a significant improvement of the model.

To test the mediation hypothesis 2, we used the SRM output of model 3 from Table 5 for the direct effect of actor interpersonal strengths use on partner strengths use ($B = 0.03, p = .326$). The output of model 2 from Table 4 for the direct effect of the intervention on actor interpersonal strengths use ($B = 0.39, p < .05$). The indirect effect was non-significant ($LL = -0.01, UL = 0.05$), which means there was no significant mediation of interpersonal strengths use between the intervention and partner strengths use. These statistics mean that neither actor interpersonal strengths use affects partner strengths use directly, nor does the intervention affect partner strengths use indirectly via actor interpersonal strengths use. In other words, those who participated in the intervention did not report higher levels of partner strengths use because of actor interpersonal strength use compared to those in the control group. Thus, we were unable to find support for hypothesis 2.

5.2.3 Dependent variable actor relational energy (SRM)

Thirdly, for hypothesis 3, we proposed an effect of the intervention on actor relational energy, mediated by actor interpersonal strengths use.

Table 6 shows models 1, 2 and 3, which are the same for actor and partner relational energy. As mentioned in the method and further explained in Appendix D, models 1 and 2 are the same for both actor and partner relational energy since it was measured using the same items, and due to the round-robin design, all actors are partners as well.

The chi-squared difference test for the difference between model 1 and model 2 is significant with $\Delta\chi^2(3, N=518) = 19.21, p < .001$. Also the chi-squared difference test for the difference between model 2 and model 3 (actor) is significant with $\Delta\chi^2(5, N=518) = 108.19, p < .001$. Thus adding first the intervention and then adding actor and partner interpersonal strengths use significantly improved the model for dependent variable actor relational energy.

To test the mediation hypothesis 3, we used the SRM output of model 3 (actor) from Table 6 for the direct effect of actor interpersonal strengths use on actor relational energy ($B = 0.59, p < .001$) and the output of model 2 from Table 4 for the direct effect of the intervention on actor interpersonal strengths use ($B = 0.39, p < .05$). The indirect effect was significant ($LL = 0.05, UL = 0.41$), which means that interpersonal strengths use positively mediates the intervention and actor relational energy. These statistics indicate that actor interpersonal strengths use affects actor relational energy directly, and the intervention affects actor relational energy indirectly via actor interpersonal strengths use. So, those who participated in the intervention reported higher levels of actor relational energy because of actor interpersonal strength use compared to those in the control group. Therefore we find support for hypothesis 3.

Table 6: Regression of Actor Relational energy

	<u>Model 1</u>			<u>Model 2</u>			<u>Model 3</u>		
	<i>B</i>	SE	<i>p</i>	<i>B</i>	SE	<i>p</i>	<i>B</i>	SE	<i>p</i>
Fixed effects									
Intercept	5.30	0.13	.000	5.49	0.19	.000	5.37	0.15	.000
Design group (DG)				0.23	0.28	.441	0.19	0.22	.420
Time (T)				-0.55***	0.11	.000	-0.14	0.10	.141
Intervention (DG x T)				-0.05	0.16	.778	-0.23	0.14	.105
Actor Interpersonal Strengths Use							0.59***	0.03	.000
Partner Interpersonal Strengths Use							0.02	0.03	.355
Random effects									
Group	0.09	(7%)		0.09			0.06		
Actor	0.47	(39%)		0.47			0.21		
Partner	0.01	(1%)		0.01			0.01		
Dyad	0.00	(0%)		0.00			0.00		
Time	0.64	(53%)		0.56			0.37		
Generalized reciprocity	-0.06			-0.07			-0.01		
Dyadic reciprocity	-0.29			-0.21			-0.19		
Model fit									
Log-Likelihood	-596.92			-577.71			-469.52		

Fixed effects contain B = unstandardized coefficients and SE= standard error, for random effects variance and covariance parameters are given. For model 1, the social relations model variance decomposition results are included in %. $N = 518$ (directed dyadic ratings, both pre and post-intervention measurements are included). ***, $p < .001$, **, $p < .01$, *, $p < .05$ (two-tailed).

5.2.4 Dependent variable partner relational energy (SRM)

Fourthly, for hypothesis 4, we proposed an effect of the intervention on partner relational energy, mediated by actor interpersonal strengths use.

From Table 6 the information for partner relational energy can be extracted, we further explained this in Appendix D.

The chi-squared difference tests are the same for partner relational energy as for actor relational energy.

To test the mediation hypothesis 4, we used the SRM output of model 3 (partner) from Table 6 for the direct effect of actor interpersonal strengths use on partner relational energy ($B = 0.02$, $p = .355$) and the output of model 2 from Table 4 for the direct effect of the intervention on actor interpersonal strengths use ($B = 0.39$, $p < .05$). The indirect effect was non-significant (LL=-0.01, UL=0.04) meaning there was no significant mediation of interpersonal strengths use between the intervention and partner strengths use. Based on these statistics, we conclude that neither actor interpersonal strengths use affects partner relational energy directly nor the intervention affects partner relational energy indirectly via actor interpersonal strengths use. This conclusion means that those who participated in the intervention did not report higher levels of partner relational energy because of actor interpersonal strength use compared to those in the control group. Therefore we are unable to support hypothesis 4.

5.2.5 Dependent variable actor job performance (Multilevel model)

Table 7: Multilevel model for job performance

	<u>Model 1</u>			<u>Model 2</u>			<u>Model 3</u>		
	<i>B</i>	SE	<i>p</i>	<i>B</i>	SE	<i>p</i>	<i>B</i>	SE	<i>p</i>
Intercept	7.89	0.31	.000	5.77	0.38	.000	5.77	0.38	.000
Design group (DG)				3.36***	0.44	.000	3.36***	0.45	.000
Time (T)				0.77**	0.28	.008	0.77*	0.30	.012
Intervention (DG x T)				-0.77*	0.38	.047	-0.77*	0.38	.049
Actor interpersonal strengths use							0.01	0.12	.947
Model fit									
Log-Likelihood	-105.36			-83.54			-84.77		

B = unstandardized coefficients and SE= standard error. *N* = 69 (team leader rating of individuals, both pre and post-intervention measurements are included).***,*p* < .001 , ** ,*p* < .01 , * ,*p* < .05 (two-tailed).

Lastly, for hypothesis 5, we proposed an effect of the intervention on actor job performance mediated by actor interpersonal strengths use.

Table 7 shows the three models as was explained in the method. The chi-squared difference test was used, the difference between model 1 and model 2 is significant with $\Delta\chi^2 (3, N=518) = 21.82, p < .001$. The chi-squared difference test was used and between model 2 and model 3 and was insignificant with $\Delta\chi^2 (4, N=518) = 1.23, p = .873$. Thus, adding the intervention significantly improved the model for actor job performance, however, adding actor interpersonal strengths use was unable to improve the model significantly.

To test the mediation hypothesis 5, we used the output of model 3 from Table 7 for the direct effect of actor interpersonal strengths use on job performance ($B = 0.01, p = .947$) and the output of model 2 from Table 4 for the direct effect of the intervention on actor interpersonal strengths use ($B = 0.39, p < .05$). The indirect effect was not significant (LL = -0.30, UL = 0.30), thus there was no significant mediation of interpersonal strengths use between the intervention and actor job performance. This means there were no indirect effects of the intervention on actor job performance via actor interpersonal strengths use. This mediation result means that those who participated in the intervention did not receive higher job performance ratings from their team leader because of actor interpersonal strength use compared to those in the control group. Henceforth, we were unable to find support for hypothesis 5.

5.3 Qualitative evaluation of the intervention

After the intervention and data collection, we presented the results to the participants and evaluated the intervention with them. We were interested in how they experienced the intervention and whether we should report what was not captured by the surveys. The evaluation happened twice with self-selected people, therefore, these qualitative findings might only be generalizable for some participants of the sample group (of the quantitative analysis). The two groups consisted of 7 and 8 participants, so totaling 15 participants, of which 6 were team leaders, participated in the discussion. In the total sample 8 team leaders participated in the quantitative part of the study, and thus 6/8 team leaders were present for the qualitative evaluation. We summarized the main findings per question :

- *How did you experience the workshop?*

Everyone was very positive about the workshop's content, the duration, and how it stimulated the participants to seek out each other's strengths (all 15 present and all

5/6 team leaders emphasized they saw energy within their teams rise). The intervention helped the teams get acquainted with each other in new ways (4 team leaders emphasized this) and facilitated insights which re-arranged task distribution so that individuals started working from their strengths (2 team leaders).

The workshop created a sense of awareness about the strengths of other people, this also might have made participants more conscious of what they were filling in after the workshop (5/15 participants).

- *How did you experience filling out the surveys?* To the person responsible for this study within Ordina, there were numerous complaints that the survey was too long (8 individuals reported this to the responsible). Rather than 15 minutes per survey, the survey should be 5 minutes long. The length of the survey could have caused a drop over time, participants felt too burdened with a lengthy survey (8/15 participant). Regarding filling out (partner) strengths use, some participants also referred to why someone asked them something, such as availability or common sense. Thus when partners filled out the survey and had to recall then they used their strengths for actors, they most likely did not recall such interactions as interactions in which they used their strengths (2/15 participants).

Regarding filling out (partner) strengths use, they emphasized that there might be a need for more awareness from the partner's perspective when the actor used their strengths, especially in hindsight when filling out the survey. When the survey arrived sometime later, and they had to fill out in which interactions they used their own strengths, they forgot for whom they used their strengths because it did not take them much effort, and they enjoyed doing it. Moreover, the other person (actor) did not emphasize that the reason for approaching the partner specifically was for their strengths. So what they said was when an actor wants to use the interpersonal strengths of the partner and does so without telling the partner that the intention for choosing that partner was because of the strengths, the partner might not always have been aware of the fact that they used their strengths. Thus when filling out the survey after a week, they (the partners) easily forget, while the actors remember clearly whom they had actively sought out for interpersonal strengths use (4/15 participants).

- *What other things would you like to tell or report that happened during/due to intervention?*

Besides learning about their own strengths and the strengths of other people, some participants realized that specific strengths complementary to their own strengths needed to be added (in their team). Therefore, they actively sought out new people to join the team to complement the strengths and create a balance of diverse strengths that complement each other (2 participants, 1/9 teams).

During the period we gave the interventions, some teams got new managers, causing adjustment challenges and disagreements. This could have had a negative influence on team motivation and team energy (3/9 teams).

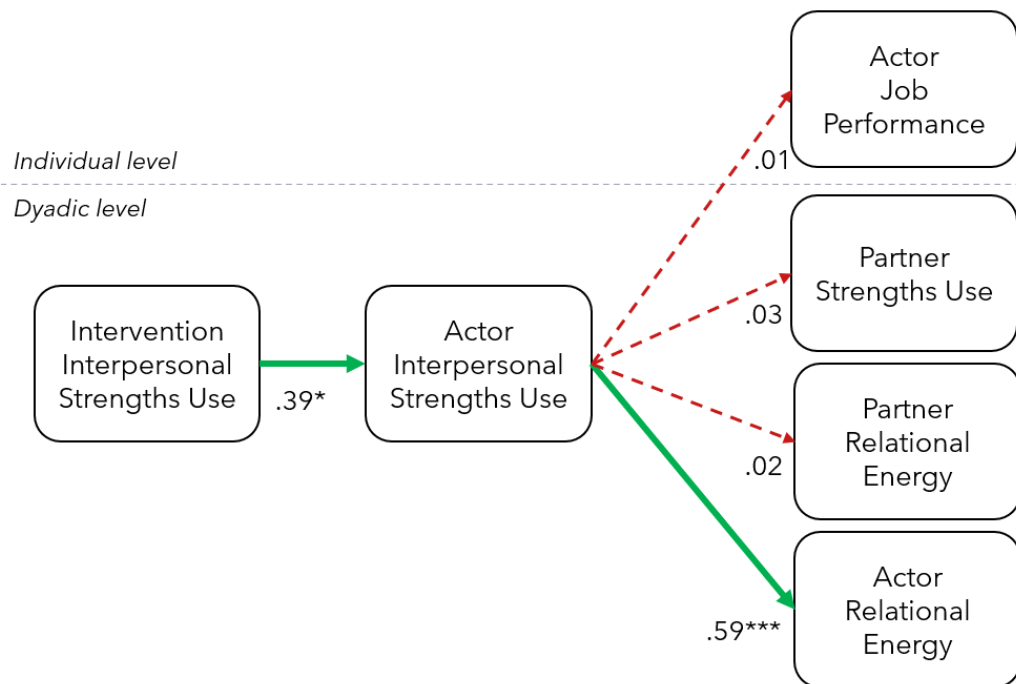
During the last months, Ordina was amidst a reorganization, which could have increased pressure on their employees (information provided by contact person).

- *Would you repeat this workshop?*
Yes, all team leaders requested the intervention material to be made available (13/15

participants).

5.4 Summary

To summarize, we visualised the direct effects in Figure 11 and summarized the meditation effects in Table 8. Hypothesis 1 is supported as we found a significant intervention effect on actor interpersonal strengths use.



Solid green lines represent significant direct effects, and dotted red lines represent non-significant direct effects.

***, $p < .001$, **, $p < .01$, *, $p < .05$ (two-tailed).

Figure 11: Theoretical model with unstandardized coefficients and significance

We summarized the other four hypotheses in Table 8, and concluded if we could support the hypothesis in the last column. Only mediation hypothesis 3 was supported, thus, the effect of the intervention on actor relational energy was mediated by actor interpersonal strengths use.

Table 8: Summary results mediation hypotheses

Hypothesis	Independent variable	Mediator	Dependent variable	LLCI	ULCI	Conclusion
2	Intervention interpersonal strengths use	Actor interpersonal strengths use	Partner strengths use	- 0.01	0.05	Not supported
3	Intervention interpersonal strengths use	Actor interpersonal strengths use	Actor relational energy	0.05	0.41	Supported
4	Intervention interpersonal strengths use	Actor interpersonal strengths use	Partner relational energy	- 0.01	0.04	Not supported
5	Intervention interpersonal strengths use	Actor interpersonal strengths use	Actor job performance	- 0.30	0.30	Not supported

LLCI: Lower Limit Confidence Interval, ULCI: Upper Limit Confidence Interval. Determined using the MCMAM with a 95% confidence interval.

6 Discussion

This study aimed to conceptualize interpersonal strengths use, stimulate it with intervention and examine the effects on strengths use, relational energy, and job performance. This study started with RQ1, what is interpersonal strengths use? Answering RQ1, we have introduced interpersonal strengths as an interpersonal pro-active working strategy, whereby the actor seeks the partner's strengths. After introducing interpersonal strengths use, RQ2 was whether it is possible to stimulate this with an intervention. To answer RQ2, we tested whether the interpersonal strengths use intervention stimulated interpersonal strengths use, which was hypothesis 1. We were able to stimulate interpersonal strengths use with the interpersonal strengths use intervention and thus found support for hypothesis 1. Lastly, RQ3 directed the research toward examining a positive mediation of interpersonal strengths use between the intervention and the dependent variables (i.e., partner strengths use (hypothesis 2), actor relational energy (hypothesis 3), partner relational energy (hypothesis 4) and actor job performance (hypothesis 5)). We found support for actor interpersonal strengths use positively mediating between the intervention and actor relational energy (supporting hypothesis 3). However, we were unable to support the mediation of actor interpersonal strengths use between the intervention and partner strengths use (not supporting hypothesis 2), partner relational energy (not supporting hypothesis 4), and actor job performance (not supporting hypothesis 5).

6.1 Theoretical implications

The theoretical implications comprise contributions to three literature areas, starting with the interpersonal strengths use intervention literature. Afterward, we discuss how we contributed to the literature fields of strengths use, relational energy, and job performance with the effects of interpersonal strengths use. Lastly, we discuss the theoretical contributions of the SRM literature.

6.1.1 Interpersonal strengths use intervention

Firstly, as expected, the intervention had a significant positive effect on interpersonal strengths use, thereby establishing that interpersonal strengths use can be stimulated. We showed that the intervention positively and significantly affected interpersonal strengths use, which was hypothesis 1. Thereby, the main theoretical contribution of this study is the introduction of interpersonal strengths use and showing that we can stimulate it with an intervention. Just like the value of strengths use intervention is brought by the positive effects of increasing strengths use, we have now established a method of increasing interpersonal strengths use.

Besides, we contributed by verifying that one of the three parts of the intervention worked. We based the intervention on the structure identified by Meyers and van Woerkom (2017): identify, develop and use. With the increased interpersonal strengths use, we can conclude that the *use* part of the intervention worked since individuals used more interpersonal strengths. Thereby, we contributed to the literature about (interpersonal) strengths use interventions.

Lastly, since we have successfully stimulated interpersonal strengths use with the newly designed intervention, there is no evidence suggesting that we did too many new things at once. First establishing correlations between interpersonal strengths use and dependent

variables, followed by conducting an experiment would not have necessarily made the experimental part less complicated. So, even though it might seem like a lot, we think the results of the intervention show it was not a limitation to introduce and stimulate interpersonal strengths use at once.

6.1.2 Effects of interpersonal strengths use

Strengths use literature

To start, we were unable to support the effects of actor interpersonal strengths use on partner strengths use, possibly due to differences between self- and other-rated measures, and unawareness/forgetting of the partner.

Self vs other rated

Through the differences between self and other ratings about partner strengths use, we learned that there is a discrepancy between how the actor and partner perceive partner strengths use. Actor interpersonal strengths use is an other-rating, and partner strengths use is the self-rating about the same interaction. When the partner did not (intend to) use their strengths, the relation between actor interpersonal strengths use and partner strengths use indeed is insignificant. Belschak and Den Hartog (2010) concluded that self-rated behavior explains more variance than other-rated ratings. Den Hartog and Belschak (2007) attribute this to other-rating individuals who base their ratings on their own observations rather than confirming how the self-rating person intended to behave. In our case, the partner does the self-rating by rating the use of his own strengths during an interaction with the actor. Then, actor interpersonal strengths use is the other rating of the actor observing that the partner uses his strengths for the actor. The results show a clear difference between the self-rated and other-rated perceptions about partner strengths use about the same interaction, this discrepancy often happens (Belschak and Den Hartog, 2010). We contribute to strengths use literature by showing the novel insight that *strengths use* is not perceived similarly by the actor and the partner.

Unawareness of the partner

Another reason for the lack of effects of interpersonal strengths use on partner strengths use might have been that partners were unaware or forgot that they used their strengths during an interaction. During the qualitative evaluation, participants reported that they mostly were unaware that the actor approached them for their strengths. Participants said they quickly forgot how often they used their own strengths in interactions with actors since strengths use is so effortlessly and enjoyable that they did not recall such interactions as 'having done something for an actor'. The participants said that even if they used their strengths, they did not remember that interaction as an interaction where they used their strengths, probably because the actor did not acknowledge it. The lack of acknowledgment of the actor might have left the partner unaware that they were using their strengths during that interaction. If actors acknowledge that they approach a specific partner for their strength, partners will also become aware of their strengths use during that interaction. This helps partners remember to fill that out in the survey as well. The insight from the qualitative evaluation is that partners most likely are unaware *when* they use their strengths during interactions and, therefore, might be unable to recall it when completing the survey. We contribute to strengths use literature by showing that unawareness on an individuals level (Govindji and Linley, 2007), also happens on an interpersonal level.

To summarize, other reasons for not having found effects of interpersonal strengths use on partner strengths use might be due to differences in how the actor and partner perceived

interactions and that partners may need to remember when they used their strengths during interactions.

Relational energy literature

The current study contributes to relational energy literature by introducing interpersonal strengths use as a mechanism for transference for the actor. Baker (2019) concluded that little is known about the effective transference of relational energy. Our findings showed that interpersonal strengths use positively mediated between the intervention and actor relational energy. We introduce a pro-active working method that produces heightened relational energy for the actor, thus offering a new strategy for the actor to obtain relational energy.

On the other hand, we also showed that partner relational energy is not directly increased by interpersonal strengths use. Thereby we contributed by showing that the direct benefits of interpersonal strengths use are not for both the actor and partner. In future research, we discuss the potential indirect effects of interpersonal strengths use on partner relational energy, via partner strengths use.

Job performance literature

We contributed toward showing there are no direct interpersonal strengths use effects on performance, thereby adding novel insights to what is not affected by interpersonal strengths use. No effects of interpersonal strengths use on job performance were found while we adhered to the rule of thumb with a sample size of 69, which is between 30 and 500 (Roscoe, 1975). Therefore it is most likely that interpersonal strengths use does not directly influence job performance. However, job performance may be indirectly enhanced through the positive effects of interpersonal strengths use on other dependent variables.

6.1.3 Methodological contribution to SRM literature

We have contributed by adapting the R-code for the SRM analysis to include time, thereby, new opportunities arise for analyzing dyads over time. Little is known about dyadic transference in many other research fields. If these fields use our adaption of the R-code, we can learn much more about dyadic developments over time. Besides, this is one of the few studies that combined an intervention study with the SRM, and contributed by showing how effective the SRM is for extracting dyadic results from teams that participated in an intervention. Statistically, we have distinguished team effects and dyadic effects by using the SRM (Snijders and Kenny, 1999), and we found in all regression models (tables 4, 5, 6) that the variance attributed to the team was very low to zero. Thus the effects of collecting dyadic data within teams are limited since the group effects do not disturb the results of the dyadic effects. Data collection using the SRM is practically feasible to obtain a large sample size, for instance with 9 complete teams we obtain over 500 dyadic ratings. Another advantage of inviting complete teams is that all actors and partners participated in the intervention. Therefore the results are not limited by one of the individuals being absent from the intervention since everyone has participated and gone through the same learning process. Therefore, the SRM makes dyadic data collection practical and, at the same time, provides meaningful dyadic results.

6.2 Practical implications

To start, we have successfully developed an interpersonal strengths use intervention, providing organizations with a practical way of stimulating it. The organization that participated in this study also intends to use the intervention and multiple team leaders have requested the intervention materials. They are interested in using the intervention since they experienced it as a positive and creative way of re-organizing collaborations within teams, this can be concluded based on the qualitative evaluation. Namely, besides realizing whom to approach for which strengths, the intervention also provided an opportunity to evaluate what strengths were missing and inspired participants to seek out other individuals with those strengths.

Further, this study provides a strategy for increasing one's relational energy: interpersonal strength use. Having a strategy to increase the energy one obtains from interactions is valuable for oneself since energy is a (scarce) resource. In addition, increasing relational energy is also valuable for organizations since it affects job performance. Relational energy positively affects work job performance (Owens et al., 2016) and buffers against de-energizing interactions (Gerbası et al., 2015; Mao et al., 2021), and therefore valuable for organizations. Lastly, the findings of this study are generalizable for other organizations where interpersonal collaboration is present, which is all around in organizations (Boyatzis and Rochford, 2020). Other organizations could also facilitate the workshop to encourage employees to use interpersonal strengths. Our findings indicate that using other people's strengths in interpersonal collaboration energizes oneself. Nothing about our findings ties the positive effects specifically to Ordina, therefore, we argue that the findings are generalizable.

6.3 Limitations

Intervention limitations

Firstly, the intervention might have directly affected partner strengths use since it is an adaptation of a strengths use intervention by Van Woerkom and Meyers (2019). The intervention started with identifying their own strengths, which was necessary to learn about the strengths of others as well. However, this new awareness could have also stimulated individuals to use their own strengths (Govindji and Linley, 2007). The statistical results do not exclude an effect of the intervention on partner strengths use either. Table 5 shows a significant intervention effect on partner strengths use ($B = 0.37, p < .05$), but the chi-square difference test was non-significant after including only the intervention ($\Delta\chi^2(3, N = 518) = 6.2, p = .102$). These are mixed signals about whether the intervention directly affected partner strengths use, but we cannot exclude direct effects.

Besides, we are unaware of the long-term effectiveness of the interpersonal strengths use intervention. Duan et al. (2018) showed significant short-term effects of the strengths use intervention, but in the long term, those effects faded. We need to be made aware of the long-term effects of the interpersonal strengths use intervention on interpersonal strengths use. It would have been interesting to do a long-term follow-up and examine how long the dyads sustained the higher levels of interpersonal strengths use.

Measurement limitations

Firstly, common method bias might have been present since the variables were measured by asking the same individual, however, we have also remedied the bias by asking the partner about the same interaction. Since independent and dependent variables were measured

by asking the same individual, we may have some common method bias (Podsakoff et al., 2003). However, we attempted to counter the common method bias with our study design since we collected data from the actor and partner’s perspective about the same interaction. By collecting data from the actor and partner, we eliminated many sources for the common method bias, namely: ‘consistency motifs, implicit theories, social desirability tendencies, dispositional and transient mood states, and any tendencies on the part of the rater to acquiesce or respond in a lenient manner ’ (Podsakoff et al., 2003).

Further, the mean for all variables dropped over time for both design groups, possibly due to raising awareness through the surveys, the reorganization of Ordina, and the survey length. Notice the negative effect of Time (T) in all regressions, and in the visualizations of Appendix D the drop also becomes apparent. After filling out the first survey, some individuals might have realized that they are not as aware of the strengths of their colleagues and are not actively using them. Consequently, when they (both the control and experiment group) filled out the post-intervention measurement, they might have been more strict with themselves about whether they used the strengths of their colleagues. Besides this awareness, the reorganization at Ordina also caused some pressure and stress. Therefore the participants might have needed more time and attention for the survey than they had anticipated. Also, in the qualitative evaluation of the intervention, it became clear that many participants found the survey too long. The survey length could have also negatively influenced how they filled out later surveys, and therefore contributed to the negative effect measured over time.

Lastly, to measure job performance, we asked the team leaders to rate the job performance of their subordinates on a scale from 1-10. However, if we had used multiple-item questions answered with a Likert scale from 1-7, we could have prevented distinct ways of interpreting job performance by the different team leaders. On the other hand, asking more questions about performance would have added to the survey length, which could have demotivated the team leaders to fill out the survey. So in hindsight, however interesting it was to include performance, we should have limited the scope to manage the survey length and burden for the participants.

Sample size limitations

To start, the group and individual levels’ sample size was too small, and thus all interesting findings are at the dyadic level. The sample size was big enough to split the actor and partner variance of the SRM. With 518 dyadic observations, we adhere to the requirements set by Kenny et al. (2020) for partner variance which requires at least 396 measurements. For actor variance around 660 dyadic ratings are required, our sample is lower but since we did find significant chi-square difference tests and significant results the sample size seems to have been big enough. However, we only had nine teams and 53 individuals, which makes it hard to conclude on those levels. Thus, the sample size for dyadic level conclusions was big enough, but not for conclusions on team and individual level.

Additionally, the sample for specific SRM components needed to be higher, however, these components were different from the aim of this study. For generalized and dyadic reciprocity, the power was too low. Kenny et al. (2020) estimate the following number of groups when aiming for a power of 0.8 when using round-robin data. To detect the covariances, the following sample sizes are recommended: for generalized reciprocity 20 groups of 12 individuals or 324 groups of 4 people, and for dyadic reciprocity 8 groups of 12 individuals or 132 groups of 4 people are required. In this study, nine groups participated with varying sizes, from 4 to 8 members. Our sample lies between those estimations but probably needs to be higher. Thus even though we reported generalized and dyadic reciprocity

in all tables, no conclusions should be drawn from these.

6.4 Future research

For future research first some directions for the intervention are presented. Then we proceed with the future directions for partner strengths use and actor and partner relational energy. The only mediation hypothesis supported was actor interpersonal strengths use affecting actor relational energy, which seems to indicate that the only the actor benefits from interpersonal strengths use. Moreover, the correlation Table 3 (be warned about independence assumption violation) also shows significant correlations between actor-actor and partner-partner variables. Although these two observations direct towards only the actor benefiting, we think that the partner also benefits. To understand how and when the partner benefits as well, future research should focus on the essential boundary condition and moderators for the effects on partner strengths use and partner relational energy. The last directions are tied to new dependent variables and we discuss the value of a larger sample size.

The interpersonal strengths use intervention

We designed the intervention according to the three steps identify, develop and use (Meyers and van Woerkom, 2017), and concluded the success of the step *use*, however, we are unaware of the contributions of the steps *identify* and *develop*. We found that interpersonal strengths use increased after the intervention, but we should study what contribution came from the steps identify and develop. If future research includes measurement about which strengths are identified about others, we could test whether the identify step was successful. To test the effects of the development step, we should carefully examine what we are trying to increase. The development step directs individuals toward seeking the strengths of others they do not have themselves, otherwise, they could have used their own strengths. So, to test the develop step, we should measure whether individuals use strengths of others that they do not have. When future research examines the effects of the identify and develop step, we understand even better through which steps interpersonal strengths use is further stimulated. Based on this, we could improve the intervention by spending more time on the steps with the largest effects.

Effects of interpersonal strengths use on partner strengths use

Firstly, to better understand the effects of interpersonal strengths use on partner strengths use, we should test whether the partner is aware of his strengths use during an interaction. Partner unawareness of when they use their strengths in dyadic interactions can be plausible, since on an individual level strengths knowledge is commonly low (Govindji and Linley, 2007). During the intervention, we could instruct the actors to validate/acknowledge that they are about to use the partner's strengths. Then, in the survey, it would be possible to measure a validation of the actor, verifying that they are using the partner's strengths. If, after such a study, the effects of actor interpersonal strengths use on partner strengths use are still non-significant, then we can conclude that partner unawareness is not the reason for a non-significant effect.

Secondly, the extent to which the actor identifies the partner's strengths could be an essential boundary condition and, therefore, a moderator in the relation between actor interpersonal strengths use and partner strengths use. Govindji and Linley (2007) introduced the strengths knowledge scale to measure whether people can identify their own strengths

on an individual level. Now we wonder if the actor can identify the partner's strengths on a dyadic level. For example, imagine an actor seeking out a partner's strengths without knowing about any of the partner's strengths. In that case, would one expect a significant effect of actor interpersonal strengths use on partner strengths use? On the other hand, if the actor perfectly identifies the partner's strengths, it can be expected that the effects of actor interpersonal strengths use on partner strengths use are stronger because the actor is *actually* using the strengths of the partner. It seems so intuitive, trivial and promising, it holds great potential to be researched in future studies.

Effects of interpersonal strengths use on relational energy

Firstly, strengths diversity could be a promising moderator for the relation between interpersonal strengths use and (actor and partner) relational energy. Van Woerkom et al. (2020) introduced strengths diversity as a team-level construct, and we argue that strengths diversity could also play a role in dyads. During the qualitative evaluation, we learned that certain people sought out strengths that differed from theirs to consciously increase strengths diversity. How would (dyadic) strengths diversity then affect the actor and partner? From the actor's perspective, there is a higher chance that individuals will use other strengths if available (Van Woerkom et al., 2020). Higher strengths diversity between an actor and (several) partner(s) provides the actor with more different strengths to use. Thus more job resources will be available for the actor according to the JD-R model (Demerouti et al., 2001). More resources will result in a more energizing interaction for the actor. Thus strengths diversity could positively moderate between actor interpersonal strengths use and actor relational energy. On the other hand, from the partner's perspective, there might also be positive moderation between actor interpersonal strengths use and partner relational energy. With higher strengths diversity, the partner might experience a heightened feeling of importance and thus feels he is using strengths in the right place (Grutterink et al., 2013). This might also energize the partner through the interaction and thus increase partner relational energy. To summarize, based on the qualitative evaluation and theoretical reasoning, strengths diversity could be a moderator, positively influencing the relation between interpersonal strengths use and (actor and partner) relational energy.

Furthermore, we found no direct effect of interpersonal strengths use on partner relational energy, perhaps because partner relational energy is indirectly affected through partner strengths use. Indeed, we found no support for the effects of interpersonal strengths use on partner strengths use. However, we could test the proposed indirect effect when we understand the boundary conditions for that relation. The potential positive effects of partner strengths use on partner relational energy can be argued based on what we know about strengths use. Multiple studies showed that strengths use leads to increased well-being (Wood et al., 2011; Proctor et al., 2011; Gander et al., 2013; Harzer, 2020). As explained in section 3.1.2, through the positive-activity model (Lyubomirsky and Layous, 2013), strengths use is a positive activity resulting in heightened well-being. Relational energy is a scarce resource and directly associated with well-being as well (Baker, 2019). If well-being increases through strengths use stemming from an interaction, then there might also be a domino effect of increased relational energy. Thus we propose that partner relational energy is not transferred directly through actor interpersonal strengths use but might be via partner strengths use.

Lastly, the quality of relationships could reinforce interpersonal strengths use through heightened relational energy. Liebhart and Faullant (2014) showed that relation energy could act as a booster for the quality of relationships, and we have shown that actor interpersonal strengths use increases actor relational energy. Then, because of the increased

relationship quality, the partner might seem more approachable for interpersonal strengths use. The increased relationship quality could thereby reinforce interpersonal strengths due to higher relational energy. It would be interesting to measure the quality of relationships and interpersonal strengths over time to determine whether reinforcement indeed occurs.

Interpersonal strengths use and other possible dependent variables

Adding to the dependent variables examined in this study, it would be interesting to re-search the effects of personality and how much people like each other as predictors for interpersonal strengths use. For instance, Casciaro and Lobo (2008) showed that disliking persons hinders approaching colleagues for task-related questions. Future research could also focus on such predictors as how much people like each other and how this affects the persons they approach for interpersonal strengths use.

We could also study the effects of interpersonal strengths use intervention on well-being-related variables that are positively affected by strengths use. Examples of well-being-related dependent variables that were measured after strengths use interventions are happiness (Gander et al., 2013), life satisfaction (Harzer and Ruch, 2016) and depression (Mon-grain and Anselmo-Matthews, 2012). By examining the effects of interpersonal strengths use on these variables, we can determine how much we can extrapolate the positive effects of strengths use to the interpersonal level. Besides studying strengths diversity, we could also investigate the effects of other types of diversity in dyads, like age and gender diversity. For instance, Yang and Matz-Costa (2018) examined the effects of age diversity in work dyads on work engagement and found significant effects resulting in practical implications for managers. Another example is that Lee et al. (2020) showed that higher gender diversity in dyads provided more chances for scientists to obtain journal publications. Who knows what we might learn about diversity in dyads and interpersonal strengths use? Could it be, just like how we propose that high strengths complementarity strengthens the effects of interpersonal strengths use on partner strengths use, that high diversity (i.e., age and gender) in dyads results in more interpersonal strengths use?

Future possibilities with larger sample size

Lastly, the current study could be repeated with a bigger sample size to examine the effects of actor interpersonal strengths use on partner strengths use and job performance. Ideally, for a power of 0.8 for all SRM components 20 groups of 12 people should participate in the repeated study (Kenny et al., 2020). This would also allow for examining potential cross-level effects, for example, the effects of the teams on the dyads. When repeated, we still expect the interpersonal strengths use intervention to stimulate interpersonal strengths use because the control and experiment groups had similar values for interpersonal strengths use before the intervention.

6.5 Conclusion

This study introduced interpersonal strengths use, developed an intervention that can stimulate interpersonal strengths use, and examined the effects of interpersonal strengths use on multiple independent variables. We found that actor relational energy significantly increases due to actor interpersonal strengths use, but we could not show effects on partner strengths use, partner relational energy, and job performance. This study was limited by some intervention limitations and measurement limitations. Future research should repeat the current study and focus on understanding the boundary conditions for the effects of interpersonal strength use on strengths use. Besides, future research could also examine

the indirect effects on partner relational energy. Additionally, it would be interesting to research moderators like actor strengths identification and dyadic strengths diversity. Based on our study, we recommend using the interpersonal strengths use intervention and that you seek out the strengths in others since it energizes you.

6.6 Ethics statement

The study design and data collection method for this study are approved by the ethical review board (ERB) of the Eindhoven University of Technology (TU/e).

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A Intervention Outline

A.1 Workshop





Lecture Strength Use



Lecture Strength Use



Step 1: Recognize *your own* strengths

Interview strategy

For the interviewer:

- ◆ Ask open questions
- ◆ Reply with questions 😊
- ◆ Repeat how you have understood what the other person was saying

For the interviewee:

- ◆ Do not be shy 😊

Identify your own strengths – Interview

Tell me about a situation or event in which they were at their best at work, were full of enthusiasm and the results were good.

- ◆ What was the **peak moment**? What did you feel at that moment?
- ◆ What were the **enabling conditions**? Describe in detail what enabled you to perform at your best.
- ◆ What was there in you?
Traits – abilities and strengths
Practices – things you did, things you said, things you thought

<https://trainingstation.walkme.com/feedforward-interview-innovative-performance-review/>



Introducing occupational strengths

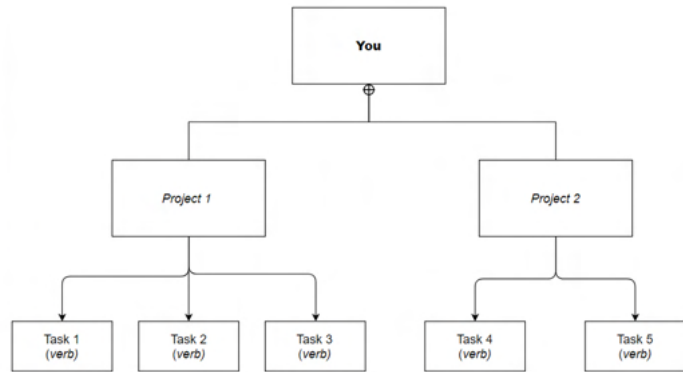
After having completed the stories by yourself and with your colleagues, have a look at the following rows. You might recognize several aspects from the stories that can be categorized as a common strength.

Strengths

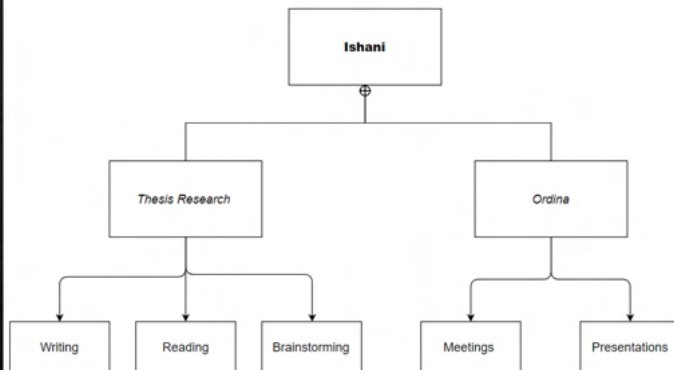
- ◆ Adaptability
- ◆ Affiliation
- ◆ Analytical thinking
- ◆ Charm
- ◆ Communication
- ◆ Coordination
- ◆ Courage
- ◆ Dedication
- ◆ Drive
- ◆ Eagerness to learn
- ◆ Empathy
- ◆ Helpfulness
- ◆ Independence
- ◆ Influence
- ◆ Inventiveness
- ◆ Meticulousness
- ◆ Positivity
- ◆ Pragmatism
- ◆ Reliability
- ◆ Serenity
- ◆ Sincerity
- ◆ Vision

Step 2: Develop recognizing *other's* strengths

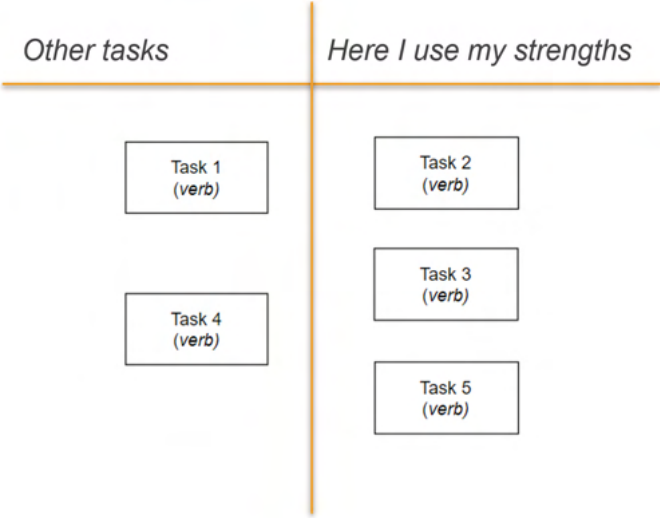
Make a diagram of weekly tasks. Write your tasks on post-its.



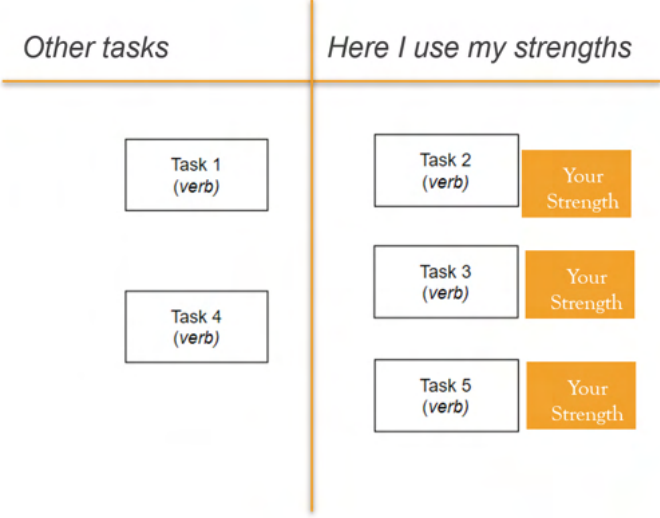
Make a diagram of weekly tasks. Write your tasks on post-its.



Now divide the tasks on post-its in two categories: 'Here I use my strengths' & 'Other tasks'



Now divide the tasks on post-its in two categories: 'Here I use my strengths' & 'Other tasks'

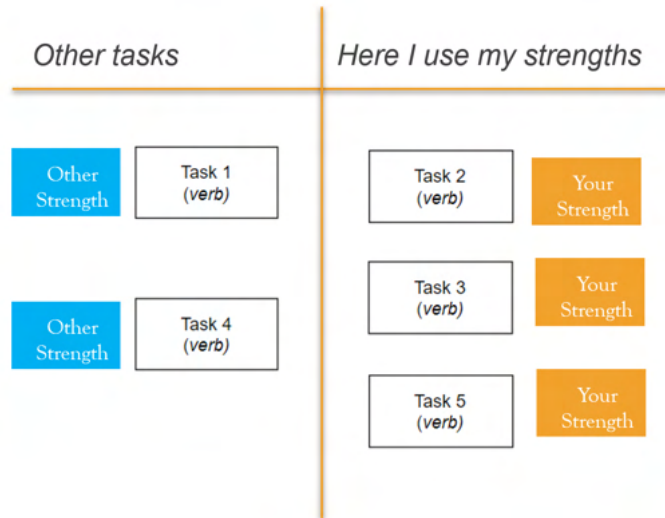




Matching strengths with team members

- ◆ Write your 5 strengths down on post-its
- ◆ Every team member has 3 minutes to mention their strengths as they stick the post-it on their name.

Now divide the tasks on post-its in two categories: 'Here I use my strengths' & 'Other tasks'



Step 3: How can *you* use other's strengths?

How can you seek out their strengths in your daily work?

- ◆ Now you have met people and talked about possibilities.
- ◆ Think about how for the coming week you plan to seek out the strengths of your colleagues.



Intention formulation

With the task [insert other task] I will use the strength [strength of another person] of [team member].

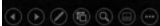
Use
SMART- actions

Check if your intentions are formulated according to SMART !



SMART

- ◆ Specific: goals should be unambiguous; clearly describe the activity you want to accomplish.
- ◆ Measurable: goals should be measurable; you should be able to reflect if the goal is accomplished or not.
- ◆ Action based: goals should be focused on what you will do rather than solely on outcomes.
- ◆ Realistic: short-term goals should be within your reach.
- ◆ Time anchored: goals should be linked to a specific time frame rather than being open ended.



Some tips

- ◆ What are potential obstacles ?
- ◆ How can you avoid them ?
- ◆ What do you need?
- ◆ Who or what can you help attain your goals?



This was the
workshop for your
interpersonal
strength use
transformation
journey !



A.2 Worksheet used during workshop

Identify your own strengths - Interview

Interviewer:

Interviewee:

The following questions are to be filled out by the interviewer!

1. What was the **peak moment**? What did you feel at that moment?

.....
.....
.....
.....
.....

2. What were the **enabling conditions**? Describe in detail what enabled you to perform at your best.

.....
.....
.....
.....
.....

3. What was there in you?

Traits:

.....
.....
.....
.....
.....

Practices:

.....
.....
.....
.....
.....

Figure 12: Worksheet page 1

Strengths

Category	Description
Adaptability	Being able to adjust easily, learn quickly, and be flexible and versatile
Affiliation	Being able to connect (with) others, work together, and maintain relationships
Analytical thinking	Being able to think critically and thoroughly about complex issues
Charm	Being nice, friendly, and fun to be around
Communication	Being able to share knowledge and clearly transfer verbal or written information
Coordination	Being able to organize, plan, structure, and/or arrange things well (e.g. activities, meetings)
Courage	Being proactive and entrepreneurial; unafraid to take initiative and voice one's opinions
Dedication	Being loyal and dedicated to a person, job, or organization
Drive	Being active, energetic and motivated to work hard to accomplish goals
Eagerness to learn	Being curious, open, interested, and eager to learn new things
Empathy	Being able to understand and appreciate others' feelings and experiences
Helpfulness	Paying close attention to others and offering support, care, and/or help
Independence	Being able to self-regulate, work and think autonomously, without external control or influences
Influence	Being able to persuade and inspire others and prompt them into action
Inventiveness	Creative thinking; being able to use imagination to develop things and ideas
Meticulousness	Being conscientious and systematic; being able to act with care and precision
Positivity	Being optimistic and having a positive attitude
Pragmatism	Being practical, down to earth, and able to efficiently recognize and solve problems
Reliability	Being dependable, punctual, responsible, and eliciting trust
Serenity	Having tranquility, patience, and calmness
Sincerity	Being honest, genuine, and authentic
Vision	Being able to think strategically, see the bigger picture, and envision the future

Figure 13: Worksheet page 2

What are your own five strengths?

Write down your own strengths based on the traits and practices you have identified:
These are **not ranked!!**

Additionally, if some of your strengths did not come forward in the story, but you know these are your strengths, you are allowed to add them here! Try to limit yourselves to 6 strengths.

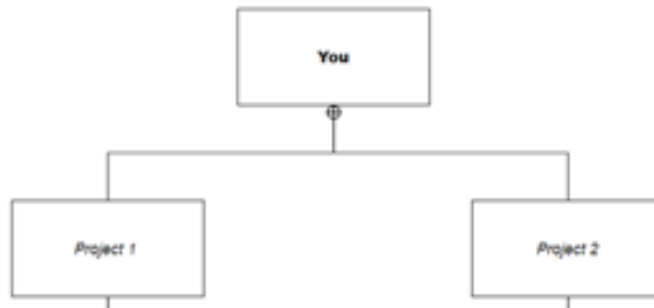
Write them down on post its!

1.
2.
3.
4.
5.
6.

Figure 14: Worksheet page 3

Mind map of your tasks

1. On the A3 paper make a task analysis. With pen make a hierarchy of the projects.



2. Continue with post its to write the tasks (which must be written in verbs) on the post its.
3. On the other side of the A3 paper, make the following table :

Other tasks	Here I use my strengths

4. Put the post it of your tasks in the column that makes sense to you.
5. Write on new post it's which of your own strengths you use for the tasks 'Here I use my strengths'

Figure 15: Worksheet page 4

Description of your personal transformation intentions:

As was explained in the slides, try to describe your intention in situations where you want to specifically stick to your intentions using the format:

With the task [insert other task] I will use the strength [strength of another person] of [team member].

Then check if your intension are formulated according to the SMART guidelines.

1.
.....
.....

- o S
- o M
- o A
- o R
- o T

2.
.....
.....

- o S
- o M
- o A
- o R
- o T

3.
.....
.....

- o S
- o M
- o A
- o R
- o T

4.
.....
.....

- o S
- o M
- o A
- o R
- o T

Figure 16: Worksheet page 5

B Survey Design

B.1 Demographics

What is your first name ?

- Name:

What gender do you identify with most?

- Female
- Male
- Other

Which age group contains your current age?

- 18-25 years
- 25-35 years
- 35-45 years
- 45-55 years
- 55-65 years
- more than 65years

What is your educational background?

- Type your answer here (Open question)

How long have you been working for Ordina?

- 0-5 years
- 5-10 years
- 10-15 years
- more than 15 years

B.2 Survey given to everyone

For the following questions you can answer on a scale from 1 (strongly disagree) to 7 (strongly agree). If the name refers to someone with whom you have not interacted at all due to absence or the name is your own name please chose N/A. For every name please restrict your choice to ticking one box.

When collaborating with the following colleagues, I capitalize on my strengths at work :

	1 (strongly disagree)	2 (disagree)	3 (somewhat disagree)	4 (neutral)	5 (somewhat agree)	6 (agree)	7 (strongly agree)	N.A.
Member 1								
Member 2								
Member 3								
Member 4								
Member 5								

When collaborating with the following colleagues in my job, I make the most of my strong points :

	1 (strongly disagree)	2 (disagree)	3 (somewhat disagree)	4 (neutral)	5 (somewhat agree)	6 (agree)	7 (strongly agree)	N.A.
Member 1								
Member 2								
Member 3								
Member 4								
Member 5								

When collaborating with the following colleagues, I use my strengths at work :

	1 (strongly disagree)	2 (disagree)	3 (somewhat disagree)	4 (neutral)	5 (somewhat agree)	6 (agree)	7 (strongly agree)	N.A.
Member 1								
Member 2								
Member 3								
Member 4								
Member 5								

I used the talents of the following people :

	1 (strongly disagree)	2 (disagree)	3 (somewhat disagree)	4 (neutral)	5 (somewhat agree)	6 (agree)	7 (strongly agree)	N.A.
Member 1								
Member 2								
Member 3								
Member 4								
Member 5								

I have benefited in my work from the strengths of the following people :

	1 (strongly disagree)	2 (disagree)	3 (somewhat disagree)	4 (neutral)	5 (somewhat agree)	6 (agree)	7 (strongly agree)	N.A.
Member 1								
Member 2								
Member 3								
Member 4								
Member 5								

I have used the personal qualities of the following people :

	1 (strongly disagree)	2 (disagree)	3 (somewhat disagree)	4 (neutral)	5 (somewhat agree)	6 (agree)	7 (strongly agree)	N.A.
Member 1								
Member 2								
Member 3								
Member 4								
Member 5								

During last week, I felt increased vitality when I interacted with this person :

	1 (strongly disagree)	2 (disagree)	3 (somewhat disagree)	4 (neutral)	5 (somewhat agree)	6 (agree)	7 (strongly agree)	N.A.
Member 1								
Member 2								
Member 3								
Member 4								
Member 5								

During last week, I felt invigorated when I interacted with this person :

	1 (strongly disagree)	2 (disagree)	3 (somewhat disagree)	4 (neutral)	5 (somewhat agree)	6 (agree)	7 (strongly agree)	N.A.
Member 1								
Member 2								
Member 3								
Member 4								
Member 5								

During last week, I felt more energy to do my work after I interacted with this person :

	1 (strongly disagree)	2 (disagree)	3 (somewhat disagree)	4 (neutral)	5 (somewhat agree)	6 (agree)	7 (strongly agree)	N.A.
Member 1								
Member 2								
Member 3								
Member 4								
Member 5								

B.3 Survey given to leader

On a scale of 1 (very bad performance) to 10 (excellent performance) can you rate the performance of every member from your team?

	Performance
Member 1	
Member 2	
Member 3	
Member 4	
Member 5	

C R-code & sample output

Original code can be found on: <http://apknight.org/pdSRM.R> (Knight and Humphrey (2019)).

```
object <- lme(dv = 1, random = list(group_id = pdBlocked(list(pdIdent( 1), pdSRM( a1
+ a2 + a3 + a4 + p1 + p2 + p3 + p4-1))))),correlation=corCompSymm(form= 1 —
group_id/dyad_id), data=d, na.action=na.omit)
```

Building further on the formula for the SRM by Snijders and Kenny (1999), we added the time dimension to the formula like:

$$Y_{ijkt} = \mu + g_k + a_{ik} + p_{jk} + d_{ijk} + \epsilon_{ijkt} \quad (\text{C.1})$$

Example of how the original code was adapted and used to run the regression of actor relational energy :

```
rm(list = ls())
library(nlme)
library(haven)
library(dplyr)
library(data.table)
setwd("C:TU Eindhovenanalysis. MAIN analysis Data set")
getwd()
my_data <- read_sav("CENTERED508.sav")
View(my_data)
source("http://apknight.org/pdSRM.R")
```

ARE - RELATIONAL ENERGY REGRESSION

ARE null model

```
ARE0 <- (lme(ARE = 1 , random = list(Team = pdBlocked(list(pdIdent( 1), pdSRM( a1
+ a2 + a3 + a4 + a5 + a6 + a7 + a8+ p1 + p2 + p3 + p4 + p5 + p6 + p7 +p8 - 1) , pdI-
dent( observationlevel-1))))), correlation=corCompSymm(form= 1 — Team/dyad_id/observationlevel),
data=my_data, na.action=na.omit, control = lmeControl(returnObject=TRUE, opt='optim',
method = 'REML'))
summary(ARE0)
srm.pct(ARE0)
```

ARE Model 1 includes workshop effects

```
ARE1 <- lme(ARE = 1+ Designgroup*Time , random = list(Team = pdBlocked(list(pdIdent( 1),
pdSRM( a1 + a2 + a3 + a4 + a5 + a6 + a7 + a8 + p1 + p2 + p3 + p4 + p5 + p6
+ p7+ p8 - 1) , pdIdent( observationlevel-1))))), correlation=corCompSymm(form= 1 —
Team/dyad_id/observationlevel), data=my_data, na.action=na.omit,
control = lmeControl(returnObject=TRUE, opt='optim', method = 'REML'))
summary(ARE1)
srm.pct(ARE1)
```

ARE Model 2 includes additional predictors

```

ARE2 <- lme(ARE ~ 1 + Designgroup*Time + AISU + PISU , random = list(Team
= pdBlocked(list(pdIdent( 1), pdSRM( a1 + a2 + a3 + a4 + a5 + a6 + a7+ a8 +
p1 + p2 + p3 + p4 + p5 + p6 + p7 + p8 - 1) , pdIdent( observationlevel-1)))) ,
correlation=corCompSymm(form= 1 — Team/dyad_id/observationlevel), data=my_data,
na.action=na.omit, control = lmeControl(returnObject=TRUE, opt='optim', method =
'REML'))
summary(ARE2)
srm.pct(ARE2)

```

For the null model, i.e. ARE null model which is the first paragraph of code the sample output would be like :

```

Linear mixed-effects model fit by REML
Data: my_data
      AIC      BIC    logLik
1366.977 1400.961 -675.4885

Random effects:
Composite Structure: Blocked

Block 1: (Intercept)
Formula: ~1 | Team
(Intercept)
StdDev:    0.2858523

Block 2: a1, a2, a3, a4, a5, a6, a7, a8, p1, p2, p3, p4, p5, p6, p7, p8
Formula: ~a1 + a2 + a3 + a4 + a5 + a6 + a7 + a8 + p1 + p2 + p3 + p4 + p5 + p6 + p7 + p8 - 1 | Team
Structure: Social Relations Model
      StdDev   Corr
a1 0.6751481
a2 0.6751481 0.000
a3 0.6751481 0.000 0.000
a4 0.6751481 0.000 0.000 0.000
a5 0.6751481 0.000 0.000 0.000 0.000
a6 0.6751481 0.000 0.000 0.000 0.000 0.000
a7 0.6751481 0.000 0.000 0.000 0.000 0.000 0.000
a8 0.6751481 0.000 0.000 0.000 0.000 0.000 0.000 0.000
p1 0.1331356 -0.455 0.000 0.000 0.000 0.000 0.000 0.000 0.000
p2 0.1331356 0.000 -0.455 0.000 0.000 0.000 0.000 0.000 0.000 0.000
p3 0.1331356 0.000 0.000 -0.455 0.000 0.000 0.000 0.000 0.000 0.000
p4 0.1331356 0.000 0.000 0.000 -0.455 0.000 0.000 0.000 0.000 0.000
p5 0.1331356 0.000 0.000 0.000 0.000 -0.455 0.000 0.000 0.000 0.000
p6 0.1331356 0.000 0.000 0.000 0.000 0.000 -0.455 0.000 0.000 0.000
p7 0.1331356 0.000 0.000 0.000 0.000 0.000 0.000 -0.455 0.000 0.000
p8 0.1331356 0.000 0.000 0.000 0.000 0.000 0.000 0.000 -0.455 0.000

Block 3: observationlevel
Formula: ~observationlevel - 1 | Team
      observationlevel Residual
StdDev:    0.01132415 0.8088814

Correlation Structure: Compound symmetry
Formula: ~1 | Team/dyad_id/observationlevel
Parameter estimate(s):
      Rho
-0.4428619
Fixed effects: ARE ~ 1
      Value Std.Error DF t-value p-value
(Intercept) 5.294102 0.1321194 509 40.07057 0

Standardized Within-Group Residuals:
      Min      Q1      Med      Q3      Max
-2.86291408 -0.65408219 0.01708072 0.55018363 3.00726766

Number of Observations: 518
Number of Groups: 9
> srm.pct(ARE2)
      variances.and.covariances percents.and.correlations
Group      0.082      6.756
Actor      0.456      37.685
Partner    0.018      1.465
Dyad       0.654      54.094
Generalized Reciprocity -0.041      -0.455
Dyadic Reciprocity -0.290      -0.443

```

Figure 17: Sample output using adapted R code

D Theoretical model translated to predictors for regression

For the interpretation, it is relevant to understand why we included both actor and partner interpersonal strengths use in Table 6. To understand the source of relational energy from the actor's perspective, we included both actor and partner interpersonal strengths use. We wanted to distinguish whether it was energizing for the actor to use the strengths of other participants (then actor interpersonal strengths use would be significant). Or whether it was energizing for the actor to use their own strengths for someone else (then partner interpersonal strengths use would have been significant). Theoretically partner interpersonal strengths use does not make sense, we were compelled to analyse it like this due to the measurement method. It is completely correct and not a limitation of the measurement method but it might just be a little confusing. Therefore we visualize what we theorized (Figure 18) and how we measured it (Figure 19).

The part of the theoretical model that we focus on in this appendix is the effect of actor interpersonal strengths use on actor and relational energy, as can be seen in Figure 18.

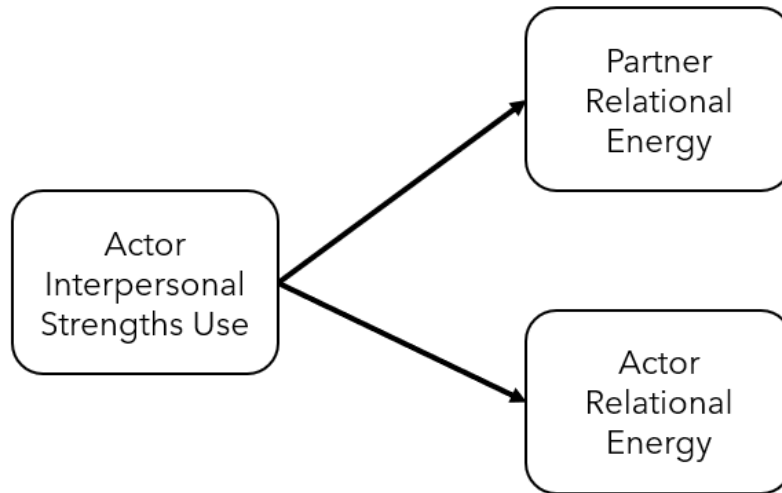


Figure 18: Original theoretical model (partial)

Figure 18 shows that we are interested in the *actor* interpersonal strengths use and how this affects *actor* and *partner* relational energy. However, we have measured relational energy as one construct, filled out by all actors and partners due to the round-robin design. Therefore the regression was conducted as depicted in Figure 19 by adding the predictor's actor interpersonal strengths use and partner interpersonal strengths use to relational energy.

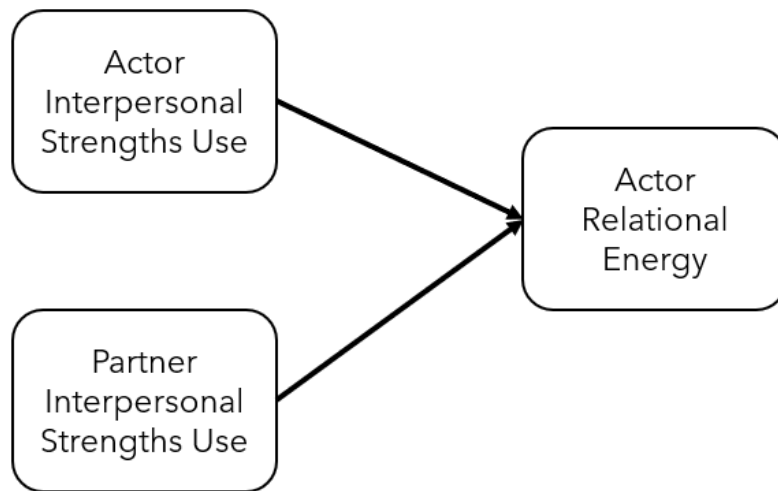


Figure 19: Regression predictors to extract actor and partner relational energy

To elaborate, to distinguish between actor and partner relational energy affected by actor interpersonal strengths use, we need to align actor-actor and cross actor-partner. For example, actor interpersonal strengths use effecting actor relational energy yields the same values as partner interpersonal strengths use effecting partner relational energy. Likewise, actor interpersonal strengths use effecting partner relational energy yields the same values as partner interpersonal strengths use effecting actor relational energy.

We did this for actor and partner relational energy and obtained the same regression results except that the values of actor and partner interpersonal strengths use are turned around. Therefore we did not add another table for partner relational energy but interpreted table 6 in two ways:

- Actor interpersonal strengths use on Actor relational energy in model 3 is hypothesis 3.
- Partner interpersonal strengths use on Actor relational energy is the same as actor interpersonal strengths use on partner relational energy and thus hypothesis 4.

E Results additional figures and interpretation SRM

E.1 Visualization mean and standard deviation for every variable

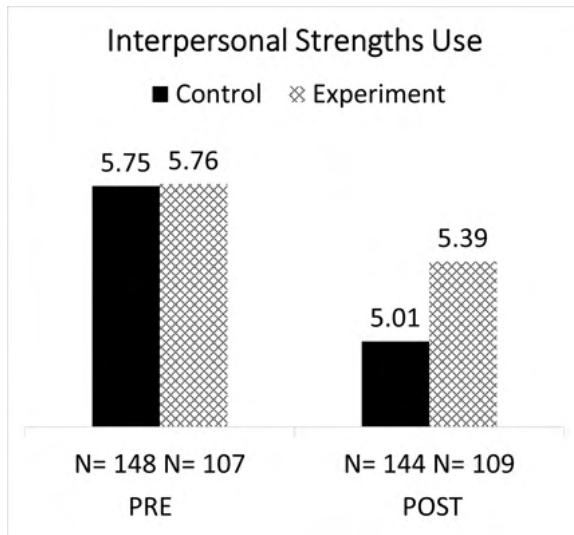


Figure 20: Pre and post measurements interpersonal strengths use

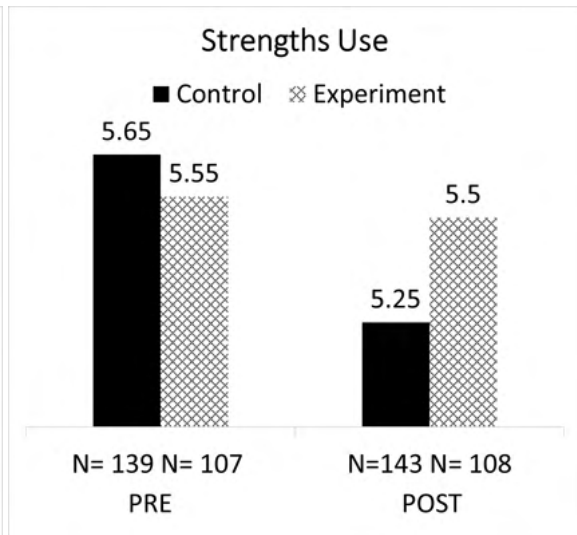


Figure 21: Pre and post measurements strengths use

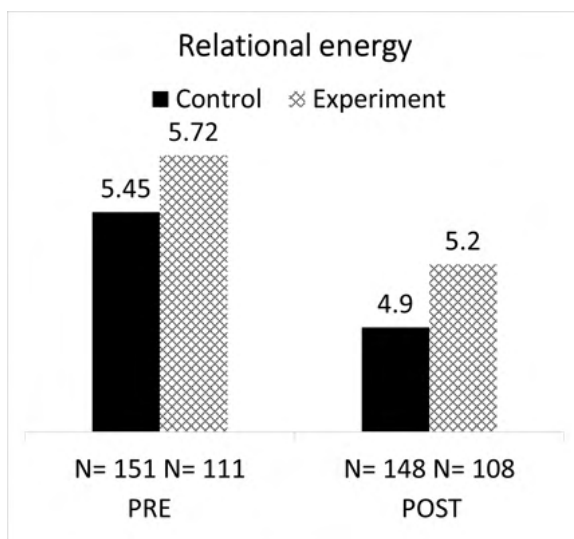


Figure 22: Pre and post measurements relational energy

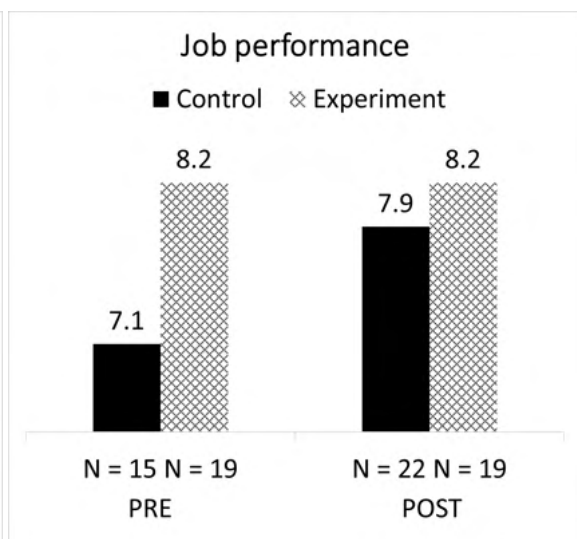


Figure 23: Pre and post measurements job performance

E.2 Interpretation SRM

Most studies using the social relations model omit the correlation table without mentioning it either. Those who did include a correlation table either excluded (Joshi and Knight, 2015) or included (Ong et al., 2016) the statistical significance. Whatever they did, they always acknowledged that their analysis method ignored the independence assumption.

For the SRM regression, the random effects are not incorporated in the interpretation of the results because that is outside the scope of our study. Nevertheless, it is valuable to understand the random effects, which contain specific variance components and reciprocity correlation. Firstly, the SRM variance components in this study are group, actor, partner, dyad, and time. The distribution of percentages for the variance components indicates how much of the variance is attributed to that specific component. Secondly, the two reciprocity correlations are generalized reciprocity and dyadic reciprocity, but we cannot conclude anything since the sample is too small. Generalized reciprocity refers to individuals who behave/perceive partners in a certain way and are perceived by the partner in the same way (Kenny et al., 2020). Dyadic reciprocity is the dyadic variation of generalized reciprocity where we examine whether behavior/perceptions are reflected within a dyad (Kenny et al., 2020). For a power of 0.8 for the reciprocity correlations, it is estimated that eight groups of 12 individuals or 132 groups of 4 people should participate in a round-robin design study (Kenny et al., 2020). Since we have nine teams with 4 to 8 members, the power specifically for the reciprocity correlations is too low.

Variance composition consists of group, actor, partner, dyad, and time variance, defined as:

- **Group effect:** ' The characteristics of the average member of the group '(Kenny and La Voie, 1984).
- **Actor effect:** ' The tendency for a person to exhibit a consistent level of response across all interaction partners is' (Kenny et al., 2020).
- **Partner effect:** ' The tendency for others to be consistent with a particular partner'(Kenny et al., 2020).
- **Dyad effect:** ' The unique combination of two individuals after removing their individual-level tendencies'(Kenny et al., 2020).
- **Time effect:** How much variance is attributed to time, i.e., how has time affected the ratings? (introduced by this study).