Superior Incompetence:

The Impact of Task and Interpersonal Incompetence on the Subordinate's Perceptions and Behaviors, and on Leadership Effectiveness

Thèse présentée à la Faculté des Sciences Economiques

Institut de Psychologie du Travail et des Organisations (IPTO)

Université de Neuchâtel

Pour l'obtention du grade de docteur ès psychologie du travail

Par

Annick Darioly

Acceptée sur proposition du jury :

Prof. Marianne Schmid Mast, directrice de thèse

Prof. Adrian Bangerter, rapporteur interne

Prof. Ronald E. Riggio, rapporteur externe

Prof. Fabrizio Butera, rapporteur externe

Soutenue le 21 juin 2011

Université de Neuchâtel

2011

Contact:

Annick Darioly

Université de Neuchâtel

Institut de Psychologie du Travail et des Organisations

Rue Emile-Argand 11, 2000 Neuchâtel, Suisse

annick.darioly@unine.ch

UNIVERSITÉ DE NEUCHÂTEL

IMPRIMATUR POUR LA THÈSE

Superior Incompetence : The Impact of Task and Interpersonal Incompetence on the Subordinate's Perceptions and Behaviors, and on Leadership Effectiveness

Annick DARIOLY

UNIVERSITÉ DE NEUCHÂTEL

FACULTÉ DES SCIENCES ÉCONOMIQUES

La Faculté des sciences économiques,
sur le rapport des membres du jury

Prof. Marianne Schmid Mast (directrice de thèse, Université de Neuchâtel)
Prof. Adrian Bangerter (président du jury, Université de Neuchâtel)
Prof. Fabrizio Butera (Université de Lausanne)
Prof. Ronald Riggio (Kravis Leadership Institute, Claremont McKenna College, USA)

Autorise l'impression de la présente thèse.

Neuchâtel, le 23 juin 2011

Le doyen

Jean-Marie Grether

■ Téléphone : +41 32 718 15 00 ■ Fax : +41 32 718 15 01 ■ E-mail : secretariat.seco@unine.ch ■ www.unine.ch

Remerciements

Durant ce long processus je me suis souvent remise en question. Etais-je vraiment compétente pour mener à bien une thèse de doctorat ? Est-ce le sujet de l'incompétence des chefs qui m'a fait douter ainsi ? Je suis en tout cas certaine d'une chose, je n'y serais jamais arrivée sans le soutien, la collaboration et les encouragements de ma directrice de thèse, de mes collègues, des étudiants de master, de ma famille, mes amis et de mon conjoint. Je profite de ces lignes pour les remercier.

Je suis tout d'abord infiniment reconnaissante envers Marianne Schmid Mast. Marianne tu as toujours cru en moi malgré mes doutes. Plus que d'être ma directrice, tu as été durant ces cinq dernières années ma mentore. Tes mots d'encouragement, tes précieux conseils, ta franchise et ta patience m'ont permis de mener à bien tant de projets. Tu m'as donné ta confiance pour l'enseignement et m'as poussé à voler de mes propres ailes. Ce qui est sûr, c'est que tu n'étais pas la source d'inspiration de mon sujet de thèse. Grâce à toi, je sais que j'ai toutes les clés en main pour la suite de ma carrière. Marianne, je te remercie du fond du cœur.

Je tiens également à remercier le comité d'experts, les Professeurs Ronald Riggio, Fabrizio Butera et Adrian Bangerter. Merci d'avoir pris le temps de lire ma thèse et d'avoir assisté à ma défense. Professor Riggio, thank you so much for taking the time to read my thesis and to have flown from your beautiful California for me.

Un grand merci à mes collègues de l'IPTO. Quelles belles années j'ai passées en votre compagnie. Merci Françoise pour toutes nos conversations dans ton bureau et pour ta bonne humeur quotidienne. Un merci particulier à l'équipe Schmid Mast. Manuel, Denise, Gaëtan, partager le bureau avec vous durant cette dernière phase était mon rayon de soleil. Vous avez toujours trouvé les mots et les petites plaisanteries pour me remonter le moral et me donner du courage. Petra, Christina, j'ai commencé à vos côtés, nous nous sommes tout de suite comprises. Merci à vous pour le partage de nos vies privées et professionnelles, vos feedbacks et votre soutien. Un merci particulier à Denise, Julia, Barbara, Petra et Ioana pour vos feedbacks respectifs concernant les différentes étapes de mon manuscrit de thèse. Merci Ioana pour tes corrections et nos conversations en anglais qui ont développées my English skills. Thanks Michael for your last check. Chère Petra, un merci encore plus spécial à toi, car tu es une amie et une conseillère hors norme. Ton soutien et tes conseils sont toujours judicieux et

si précieux. Tu as toujours su répondre à mes questions et m'orienter vers les bons choix quand je doutais.

Un grand merci au Professeur Jürgen Sauer pour sa précieuse collaboration et le temps qu'il a consacré aux analyses du projet CAMS et pour le meeting CAMS-users à Berlin. J'espère pouvoir collaborer à nouveau avec lui.

Je suis très reconnaissante envers les étudiants pour leur investissement en temps et en énergie dans la récolte des données. J'ai eu énormément de plaisir à collaborer à leurs travaux de master ou projets. Un merci particulier à Mélanie Gschwind pour son idée de la « First Aid Kit Problem », au Dr. Nicole Shechtman du « Center for Technology in Learning » en Californie pour m'avoir mis à disposition le matériel de l'étude 1 (Article 1), ainsi qu'à Nicole Bischof pour avoir passé bon nombre de samedis à Lausanne pour notre projet CAMS. Je remercie vivement les trois acteurs neuchâtelois et les étudiants du Projet 2008-2009 qui ont participé à l'étude 2 (Article 1). Un grand merci à toutes les personnes qui ont participé de près ou de loin à mes recherches : les participants aux études, les employés qui m'ont témoigné leur inconfortable situation, les responsables (certainement pas tous incompétents) qui m'ont invité à présenter mes recherches).

Je voudrais remercier mes parents, Jacques et Jacqueline Darioly pour leur patience, leur tendresse et leur compréhension. Voir partir sa fille vivre hors canton et ne pas connaître au quotidien ses frustrations et ses succès peuvent être rageant. Merci à vous chers parents, sans vous je n'aurais jamais été aussi loin dans mes études. Merci également à mon frère, Olivier, pour nos discussions sur le monde du travail et sur les responsables incompétents. Merci à toute ma famille et mes amis du Valais qui m'ont toujours rappelé les réalités de la vie hors académie. Merci à toi Gabrielle de m'avoir tenu compagnie et m'avoir fait partager ta vie par écrans interposés.

J'ai gardé le plus chaleureux et aimant Merci pour la fin. Philippe, voilà 10 ans que tu déambules à mes côtés. Tu as patienté toutes les semaines pour ne me voir que le weekend durant mon cursus universitaire. Tu as accepté de quitter notre Valais natal pour m'accompagner à Neuchâtel. Tu as essuyé d'innombrables flots de larmes quand les déceptions et les doutes étaient là. Philippe tu es l'homme le plus drôle, le plus patient, le plus compréhensif et le plus doux que je connaisse. Merci pour ton humour et ton amour.

Publication list

ARTICLE 1

Darioly, A., & Schmid Mast, M. (2011). Facing an incompetent leader: The effects of a non-expert leader on subordinates' perception and behavior. *European Journal of Work and Organizational Psychology, 20*(2), 239–265. doi: 10.1080/13594320903429576

ARTICLE 2

Schmid Mast, M., Jonas, K., Klöckner Cronauer, C., & Darioly, A. (in press). On the importance of the superior's interpersonal sensitivity for good leadership. *Journal of Applied Social Psychology.*

ARTICLE 3

Sauer, J., Darioly, A., Schmid Mast, M., Schmid, P. C., & Bischof, N. (2010). A multi-level approach of evaluating crew resource management training: A lab-based study examining communication skills as a function of team congruence. *Ergonomics, 35(11),* 1311-1324.

Abstract

My PhD thesis is situated in the field of work and organizational psychology and focuses on subordinate perspectives of superior competence and incompetence. Many organizations rely on superiors to lead subordinates toward effectiveness. However, superiors are not always competent and/or they are perceived as incompetent by their subordinates. Superior incompetence has negative but also positive effects on subordinates. The main goal of my thesis was to investigate the subordinate's perceptions and behaviors toward an incompetent superior, and the potential consequences of superior (in)competence (i.e., subordinate satisfaction, dyadic performance). I concentrated on two main types of (in)competence: task (in)competence which is the (in)capacity of a superior to solve a problem related to the subordinate's task (Darioly & Schmid Mast, 2011a) and interpersonal (in)competence which is the superior's (in)capacity to communicate clearly and effectively, to take the perspective of others, and to stay focused on the others' expectations (Hogan & Warrenfeltz, 2003). Interpersonal competence contains interpersonal sensitivity and communication skills. To study these topics, I conducted five lab studies (3 articles) mainly simulating superior-subordinate interactions on a problem-solving task. The goal of Article 1 (2 studies) was to explore the perceptions and the behaviors of subordinates who interact with a task-incompetent superior in a survival problem task. Results revealed that the subordinate of a task-incompetent superior partially took the superior's role by behaving dominantly and resisting the leader's influence. Moreover, the subordinate's perception of the superior's dominance mediated the relationship between the superior task competence and the subordinate's behavioral dominance and resistance. The first goal of Article 2 was to test the hypothesis that individuals expect interpersonal sensitivity as a superior's characteristic (Study 1). Results confirmed this expectation. The second goal was to investigate how superior interpersonal sensitivity affects subordinate satisfaction (Study 2). Results showed that superior interpersonal sensitivity was positively linked to subordinate satisfaction. The goal of Article 3 was threefold: to investigate how superior task (in)competence affects the dyadic performance, to examine the impact of superior-subordinate communication skills training on dyadic performance, and to investigate the incremental value of communication skills training (CST) on superior-subordinate task (in)competence for dyadic performance. Results confirmed the negative impact of superior task incompetence on dyadic performance, showed that CST increased dyadic performance, and indicated that a dyad led by a task-incompetent superior with a task-competent subordinate became more effective when the dyad is trained on communication. Theoretical implications as well as future research directions are discussed. Finally, main applied implications and practical advice are suggested.

Table of contents

Keywords: Task (in)competence, interpersonal (in)competence, superior, subordinate, behavior, leadership effectiveness, performance, satisfaction

Mots-clés: (in)compétence dans la tâche, (in)compétence interpersonnelle, supérieur, subordonné, comportement, efficacité de leadership, performance, satisfaction

UMBRELLA

Introduction

"Bad managers make life miserable for those who must work for them, and there is virtually nothing subordinates can do to defend themselves, except to suffer in silence" (Hogan & Hogan, 2001, p. 40). It is very probable that, once in our lifetime, each of us has worked or will work with a bad superior. To illustrate, let us consider a hypothetical example. In an international organization which has its headquarters in England, Paul (52 years old, 12 years in the company) was promoted one year ago to financial director of the French office. Recently, the finance department has implemented a new financial software program. Paul's subordinates all have been trained on it, but not Paul. Additionally, Paul has a lack of English skills and is unable to communicate clearly his ideas to the headquarters. Since he is the director, he has never taken English lessons, because of lack of time. This situation yields organizational difficulties: Paul does not adapt his instructions to an efficient use of the new software. His subordinates do not understand his instructions and are stressed. In meetings, they feel uncomfortable listening to Paul speaking English and they do not follow his suggestions. Month after month, his subordinates are increasingly less satisfied and start quitting the organization. This situation has negative consequences for the organization, because it increases recruitment costs, such as time, resources, and money.

This example is one among many depicting a current reality. Hogan and his colleagues conducted different surveys on leadership and showed that more than 65% of the employees in any given organization see their direct superior as the worst aspect of their job (Hogan & Kaiser, 2005). For 75% of employees, their superior was the most stressful aspect of their job (Hogan, 2007). One survey from the Society of Human Resource Management suggested that 20% of employees quit their jobs because they perceived their superior as incompetent (Bruce, 2010). In the French-speaking part of Switzerland, the figures look similar to those in the US. In two surveys including more than 300 employees, one employee out of five perceived his or her superior as incompetent, one employee out of two felt stressed when he or she perceived the superior as incompetent, and 74% of employees declared they would be ready to quit their job due to superior incompetence (Darioly & Schmid Mast, 2011b). In these surveys, incompetence referred to the incapacity to contribute efficiently to a social interaction which includes making a decision, solving a task, or discussing a subject (Schmid Mast, 2010). These statistics confirm that research is needed to improve this situation and that the current research is a relevant contribution to the leadership research.

Leadership refers to the process of influencing or controlling the behavior of others in order to reach a shared goal (Northouse, 2007). It is one of the most crucial issues in work and organizational psychology, because it is considered as a vital factor for an organization. In the last decades, two distinct lines of leadership research have emerged. One has investigated the good leadership (e.g., Blagg & Young, 2001; Burke, 2006; Klann, 2007) and the other bad leadership (Hogan & Hogan, 2001; Lipman-Blumen, 2005). The first line assumes that leadership is good by definition. Leadership plays an important role in the enhancement of subordinate motivation, effectiveness, and satisfaction. It is also required to coordinate the functioning of an organization and to guide organizations and human resources toward the objectives of the organization (Antonakis, Cianciolo, & Sternberg, 2004).

The second line of research has investigated how superiors fail. For instance, Hogan and colleagues assumed that superiors fail because of personality issues (Hogan & Hogan, 2001). Superior personality was assessed on 11 dimensions of the Hogan Development Survey (HDS; Hogan & Hogan, 1995). The HDS was developed from a literature review. The authors found that superiors could be high or low on each of the 11 dimensions. To illustrate, a superior might be highly or lowly excitable (e.g., He or she expects to be rejected by others) or highly or lowly arrogant (e.g., He or she expects to be respected by others). In the same vein, a lot of research was done on abusive or toxic leadership (e.g., Lipman-Blumen, 2005; Tepper, 2000; Tepper, Duffy, & Shaw, 2001; Tepper, Henle, Lambert, & Giacalone, 2008). Abusive or toxic leaders display destructive behaviors, such as treating others unfairly, manipulating and lying to subordinates, displaying favoritism, or publicly criticizing subordinates (Tepper, 2000). These behaviors have been shown to decrease subordinate satisfaction and increase psychological distress, as well as increase intentions to quit the job (Ashforth, 1997; Keashly, Trott, & MacLean, 1994). One could think that only personality issues or abusive superiors could damage organizational effectiveness. In my PhD thesis, I investigate superior incompetence as another factor that could also damage organizational effectiveness.

The topic of superior incompetence was neglected in research these last few decades, even though empirical studies suggested that having an incompetent superior affects the good functioning of organizations, such as subordinate satisfaction and team performance (e.g., Hamblin, Miller, & Wiggins, 1961; Riggio & Reichard, 2008). A lot is known about the factors which subordinates use to infer the incompetence of their superior (Yukl, 2010). If the superior's unit is unsuccessful, the superior is judged as being less competent than if the unit is successful. If the performance suddenly decreases soon after the hiring of a new superior,

the blame is attributed to the superior. To illustrate, soccer trainers are always fired after an unsuccessful season, sometimes even before the end of the season. Subordinates also concentrate on the superior's actions, especially during a crisis. If the superior fails to take a right and quick decision, he or she is perceived as incompetent by his or her subordinates (Adamchik, 2006). However, the ways in which subordinates respond to superior incompetence have been under-examined. Studying subordinates' responses is potentially of great importance because it might have strong implications for the organization (e.g., increase of cost in material and personnel resource).

In my thesis, I focus on two indispensable types of superior competence – task competence and interpersonal competence. When employees at all levels are interviewed on superior competence, they consistently cite the importance of task competence in their superior (Adamchik, 2006). Interpersonal competence is also important. For instance, research showed that a superior who was interpersonally competent and had good communication with his or her own superior was described by subordinates as providing more support and information (Cashman, Dansereau, Graen, & Haga, 1976).

Accordingly, in three articles (five studies) I investigate superior task and interpersonal competence and subordinates' responses and potential consequences of (in)competence on subordinates. The main goal of my thesis is to ascertain the impact of the (mis)match between superior position and his or her competence (task and interpersonal) on subordinates' perceptions, behaviors, satisfaction, as well as on superior-subordinate performance (dyadic performance).

Several goals have been defined:

- Exploring the perceptions and behaviors of subordinates who interact with a task-incompetent superior (Article 1, Studies 1 and 2)
- Examining whether individuals expect interpersonal sensitivity, which is a particular feature of interpersonal competence, as a characteristic of the superior (Article 2, Study 1)
- Investigating how superior interpersonal sensitivity affects subordinate satisfaction (Article 2, Study 2)
- Gaining information about how superior-subordinate dyads perform according to superior and subordinate task (in)competence (Article 3)

- Examining the impact of superior-subordinate communication skills training, which is a feature of interpersonal competence training, on dyadic performance (Article 3)

- Investigating the incremental value of communication skills training on superior-subordinate task (in)competence for dyadic performance (Article 3)

The thesis is structured as follows: In *Chapter 1*, I provide information on the main components and outcomes of the superior-subordinate relationship. In *Chapter 2*, I give an overview of past research on superior competence and its impact on subordinates; in addition, I describe how my three articles contribute to the field. In *Chapter 3*, I discuss the strengths and limitations of these articles, I revise the model of conflict dynamics depending on task competence (Butera, Gardair, Maggi, & Mugny, 1998); in addition, I discuss the implications of the current findings for future directions in this field of research. Finally, in *Chapter 4*, I emphasize the significance and implications on the work and organizational context. Note that in the current thesis I consistently use the terms superior and subordinate. These terms are synonymous with other terms used in the literature, such as employer/leader/boss versus employee/follower.

1 Components and Outcomes of Superior-Subordinate Relationship

In this chapter, I illustrate leadership as a dyadic process, review different aspects of superior competence, and introduce the concepts of task competence and interpersonal competence. I also describe the outcomes of superior competence and finally, I exemplify different problem-solving tasks linked to superior-subordinate interactions.

1.1 Dyadic process

In my thesis, I concentrate on superior-subordinate relationship as a dyadic process. Research on dyadic process focuses on how a superior influences a subordinate, for example by facilitating the subordinate's work. The leadership literature has underlined different theories conceptualizing this dyadic process, such as the role-making theory (Graen & Cashman, 1975), the noncontractual social exchange theory (K. I. Kim & Organ, 1982), and the leader-member exchange theory (Graen, Novak, & Sommerkamp, 1982) which was initially called the vertical dyad linkage theory (VDL; Dansereau, Graen, & Haga, 1975). It has been demonstrated that a favorable exchange relationship between a superior and a subordinate is correlated with greater objective performance (e.g., Graen et al., 1982; Vecchio & Gobdel, 1984), higher performance ratings (e.g., Gerstner & Day, 1997; Liden, Wayne, &

Stilwell, 1993), higher overall satisfaction (e.g., Gerstner & Day, 1997; Graen et al., 1982), and a greater satisfaction with the superior (e.g., Duchon, Green, & Taber, 1986). Overall, the theories of dyadic processes have shown that a favorable exchange relationship between a superior and a subordinate leads to positive outcomes. The predictions of the current studies are anchored in these dyadic process theories. More specifically, I assume that the superior competence or incompetence influences the dyadic exchange and leads to both positive and negative outcomes.

Researchers who focused on dyadic processes assume that when there is a superior, a subordinate exists automatically (Van Vugt, Hogan, & Kaiser, 2008). The superior and the subordinate are inseparable and interdependent in a hierarchical relationship characterized by power differences. Power stands for the ability to control or influence individuals or their resources (Schmid Mast, Jonas, & Hall, 2009). Concretely, in the superior-subordinate relationship, the superior mainly influences the subordinate. According to Robert L. Katz (1955), everything that a superior says or does (or does not say or do) affects the subordinate. The superior-subordinate relationship might be integrated in a vertical dimension.

This vertical dimension can be characterized with respect to the position in the hierarchy (*dominance position*); however superiors and subordinates can also differ in their *personality dominance* (Operario & Fiske, 2001), in how dominant they perceive each other *(perceived dominance)*, and in how dominantly they behave in social interactions (*behavioral dominance*) (e.g., J. A. Hall, Coats, & Smith LeBeau, 2005). The present research brings together these four aspects of dominance.

(1) *Dominance position*. Dominance position refers to a relative position in a prestige hierarchy such as education, income, occupation, socioeconomic status, or age (Ellyson & Dovidio, 1985) or to a legitimate position in an organization (French & Raven, 1960). Individuals in this position have the right to be there. In my thesis, I talk about high- and low-dominance positions. On the one hand, the high-dominance position is embodied by the superior and refers to the position in which superiors are expected to perform a leadership role position. The superior personifies the power. On the other hand, there is the low-dominance position which is embodied by the subordinate.

(2) *Personality dominance*. Dominance is often viewed as a personality characteristic (Exline & Messick, 1967; Fromme & Beam, 1974; Mehrabian, 1972). Personality dominance refers to a predisposition to try to influence

others (Ellyson & Dovidio, 1985). It is usually assessed with self-report questionnaires such as the Personality Research Form (PRF, Jackson, 1984) and understood as a continuum. At its high end, personality dominance is related to ambition, assertiveness, and self-confidence, whereas at its low end, personality dominance is related to shyness and submissiveness (Gough, 1984). Research has shown that personality dominance predicts who will emerge as a superior (Golub & Maxwell Canty, 1982).

(3) *Perceived dominance*. Perceived dominance is the impression an interaction partner gains of a target's dominance (Schmid Mast, 2010). Perceived dominance is typically measured with a self-report questionnaire (Tusing & Dillard, 2000).

(4) *Behavioral dominance*. Behavioral dominance can be defined as any behavior aiming at influencing others. For instance, people in a high-dominance position have generally high behavioral dominance (J. A. Hall & Friedman, 1999; Johnson, 1994). People with a high dominant personality and people who are perceived as being highly dominant tend to speak more (Schmid Mast, 2002), interrupt more (Leffler, Gillespie, & Conaty, 1982), and have a louder voice (J. A. Hall et al., 2005) than people with a low dominant personality.

In my thesis, I concentrate on the dyadic relationship between a superior (who is in a *high-dominance position*) and a subordinate (who is in a *low-dominance position*) (Figure 1). Although they interact in an established hierarchy, the behavior of superiors and subordinates (*behavioral dominance*) might depend on their *personality dominance*. Considering the subordinate as the observer, he or she perceives and interprets the superior's behaviors. The subordinate gains then an impression of the superior's dominance (*perceived dominance*).

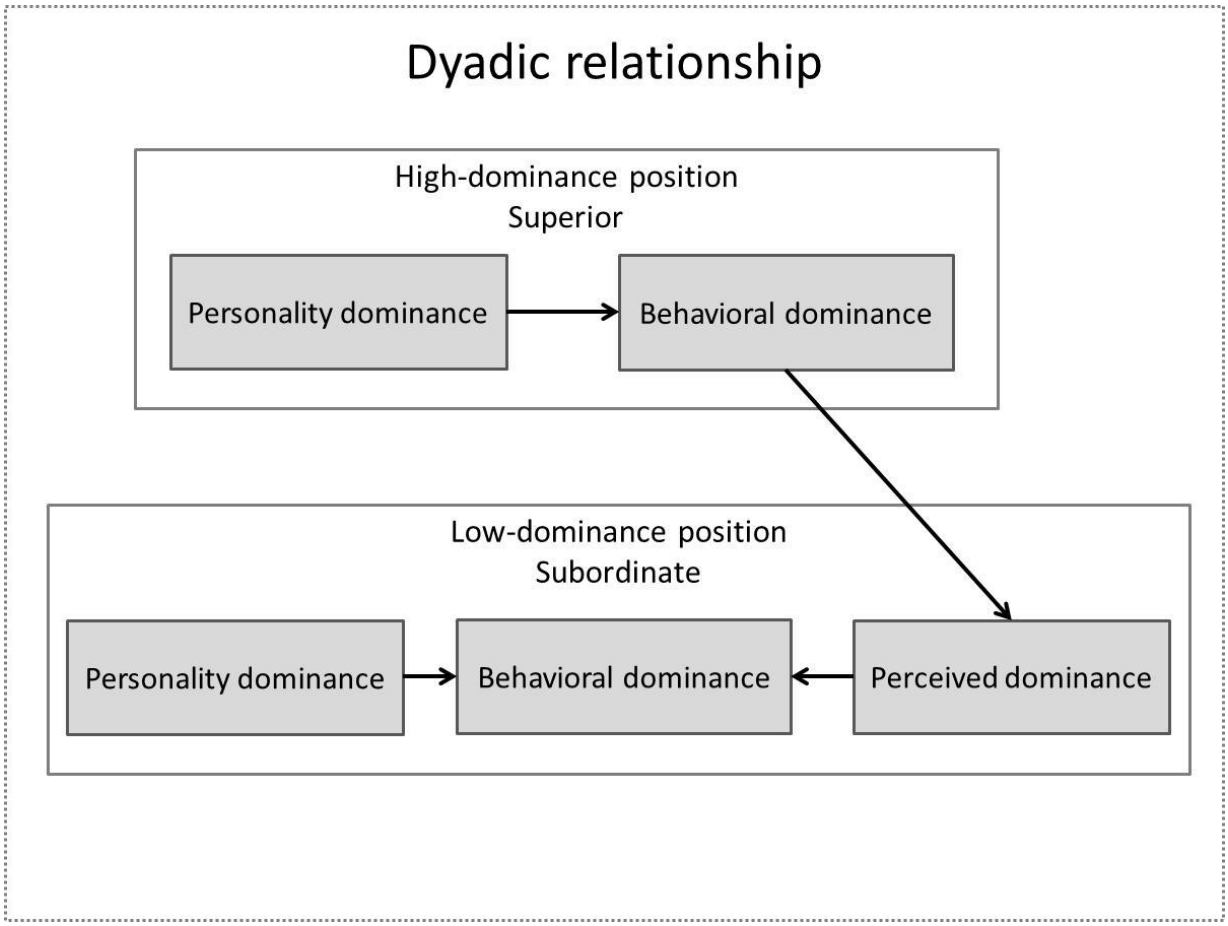


Figure 1. **The process of the vertical dimension in the superior-subordinate relationship**
The personality dominance of the superior and of the subordinate influences their behavioral dominance. How dominantly the superior behaves influences the subordinate's perception of the superior's dominance, which in turn affects how dominantly the subordinate behaves.

In the current research, I propose that the subordinate's perception of the superior and his or her behavioral dominance may be affected by the superior's competence.

1.2 Superior competence

The quality of the superior-subordinate relationship might be affected by superior competence or by the subordinate's perceived lack of competence. To illustrate, in two aforementioned Swiss surveys (Darioly & Schmid Mast, 2011b), subordinates who perceived their superior as incompetent were not satisfied in their relationship with their superior. In the following section, I further develop the concept of superior competence based on existing research and theories, such as from the Ohio State Leadership studies (Fleishman, 1953; Shartle, 1950), the Michigan Leadership studies (D. Katz & Kahn, 1952; D. Katz, Maccoby, & Morse, 1950), the Center for Creative Leadership (Lombardo, Ruderman, & McCauley, 1988; McCall & Lombardo, 1983), and the Hogan Competency Model (Hogan, 2009; Hogan & Warrenfeltz, 2003; Warrenfeltz, 1995).

Researchers developed diverse terminologies regarding skills or behaviors required for an effective superior. However, skills and behaviors required for superior effectiveness might be viewed as somewhat interchangeable (Yukl, 2010). Research demonstrated some overlaps in the conceptualization of skills and behaviors (for a review, Yukl, 2010). In some cases, competence can be expressed in behaviors. For instance, when a superior acts in a supportive manner and listens carefully to a subordinate, these behaviors can depict high interpersonal competence. Thus, behaviors can be considered as observations of competence. For this reason I conflate previous leadership theories on behaviors and skills to relate them under the expression of different aspects of superior competence and I consider them as types of superior competence. Table 1 gives an overview of the diverse superior competence's aspects. I discuss each theoretical model and the research associated with it.

Table 1
Integration of the diverse aspects of superior competence

Ohio State Leadership Studies	Michigan Leadership Studies	Stogdill's skills	Center for Creative Leadership	Hogan Competency Model
Initiating structure	*Task-oriented*	*Technical*	*Technical*	*Technical*
Consideration	*Relations-oriented*	*Social*	*Interpersonal*	*Interpersonal*
		Intellectual	Cognitive	
	Participative	Administrative		Leadership
				Intrapersonal

Note. Italic terms refer to task competence and interpersonal competence

In the 1950s, the *Ohio State Leadership Studies* found two important characteristics associated with leadership: consideration and initiating structures. Consideration refers to superior actions such as supporting their subordinates, taking the time to listen to them, or showing concern toward them. Initiating structures refer to superior actions made to achieve the team goal, such as giving new approaches to a problem or defining specific standards of performance. Consideration and initiating structures are independent of one another. The *Michigan Leadership Studies* highlighted three significant superior behaviors: task-oriented behavior, relations-oriented behavior, and participative leadership. A superior who has a task-oriented behavior is devoted to the achievement of his or her team's goals, by planning, organizing, clarifying task expectations, and by resolving urgent problems. A superior who has a relations-oriented behavior devotes more the superior-subordinate relationships. The

superior is helpful, supportive, and friendly with subordinates. Participative leadership refers to sharing ideas across team meetings and involving the team in the problem-solving, and decision processes.

Later, it was suggested that initiating structure and task-oriented behavior are similar, as well as consideration and relations-oriented behavior (Judge, Piccolo, & Ilies, 2004; Likert, 1961). Most researchers agree that these characteristics or behaviors are important for leadership and refer to superior competence or skills. Along those lines, *Stogdill* (1974) found that social, technical, administrative, and intellectual skills are the most frequent set of factors depicting an effective superior.

More recently, researchers have focused on skills associated with superior success or failure. For instance, according to the researchers from the *Center for Creative Leadership* (CCL; Lombardo et al., 1988; McCall & Lombardo, 1983), individuals in high-dominance positions may possess three specific skills (i.e., technical, cognitive, and interpersonal) relevant for predicting their failure or success (e.g., McCall & Lombardo, 1983). These three skills are needed for most leadership functions. Technical skills contain one's knowledge about processes, methods, and tools to succeed in a team task. They combine education and job experience and include knowledge about the global organization, such as structure, rules, services, and products. CCL researchers have shown that on the one hand, having too high technical skills leads to overconfidence and arrogance. On the other hand, superiors who have too narrow technical skills cannot acquire a sufficiently broad perspective and deal with different problems. Cognitive skills (conceptual) refer to intuition, creativity, and good judgment. Interpersonal skills refer to the capacity to communicate clearly and effectively, to take the perspective of others, and to stay focused on the others' expectations. According to CCL researchers, individuals in high-dominance positions often fail because of their lack of interpersonal skills.

The most recent perspective of superior competence is the *Hogan Competency Model* (Hogan, 2009; Hogan & Warrenfeltz, 2003; Warrenfeltz, 1995) which includes four competence domains (i.e., interpersonal, intrapersonal, leadership, and technical). Interpersonal skills are similar to CCL's interpersonal skills (Lombardo et al., 1988; McCall & Lombardo, 1983). Intrapersonal skills contain factors such as integrity, respect, following procedures, risk taking, stress tolerance, or work attitude. Leadership skills refer to the ability to recruit, manage, and motivate teams. They are often viewed as interpersonal skills and researchers often do not disentangle them (e.g., Anderson & Kilduff, 2009; Fletcher,

McGeorge, Flin, Glavin, & Maran, 2002). Finally, technical skills involve problem solving, specific technical skills, analysis, decision making, written communication, or training performance. As such, technical skills are similar to those proposed by the CCL's approach.

As seen in Table 1, the literature has used different terms to describe relevant types of competence for effective superiors. Also, it was suggested that the different types of competence can be prioritized according to the levels of superiors in the organizational hierarchy (D. Katz & Kahn, 1978), the type of organization, its size, or its structure (McLennan, 1967). However, it seems that two types of competence overlap between all existing models: task and interpersonal competence. As such, it is possible that the combination of these two specific types of competence is the most valuable in predicting superior effectiveness.

Consequently, in the present research, I focus on task and interpersonal competence for two main reasons:

(1) Although cited and defined differently, these two types of competence are present in all leadership theories depicted in Table 1, so there is consensus over time and between researchers that they are important (DfEE, 1999; DfEE & Cabinet Office, 1996)

(2) Task competence and interpersonal competence seem to be highly predictive of leadership effectiveness (Lord, 1985; Stogdill, 1974)

Thus, these two types of competence can be viewed as necessary skills that enable superiors to lead their subordinates regardless of their educational, cultural, or organizational background. The two concepts are interdependent in predicting superior effectiveness. On the one hand, possessing interpersonal skills without task competence is not sufficient, because low task competence bans an individual almost instantly from high-dominance positions (Van Vugt, 2006). On the other hand, in order to be perceived as task-competent, superiors should listen seriously to subordinate concerns and suggestions. Superiors who know how to communicate are perceived, among others, as more task-competent than those who do not know how to communicate (Cashman et al., 1976). These two types of competence are described in more detail in the following sections.

1.2.1 Task competence

In the context of the current research, *task competence* refers to the *superior capacity to solve a problem related to the subordinate's task*. It is related to domain-specific knowledge

which is a more generalized sense of expertise but does not necessarily mean technical expertise (i.e., knowing perfectly all specific tasks and details of the task). When subordinates work daily on a specific and technical task, they do not expect that their superiors know perfectly this specific task (i.e., technical expertise), but the superior should be familiar with the task and be able to understand what subordinates do (task competence) in order to evaluate good or bad work and to guide the subordinate concerning his or her job.

If the superior is not task-competent – he or she does not know what subordinates do and how they do it – then the superior will be unable to take the right decision or to implement changes that may improve performance (Adamchik, 2006). Task competence has also been labeled as task ability (e.g., Carter & Nixon, 1949; Stogdill, 1974), technical skills (e.g., Hogan, 2009; Yukl, 2010), technical competence (e.g., Grant, Baumgardner, & Shane, 1997; Hamblin et al., 1961; Slusher, Dyke, & Rose, 1972), or expertise (e.g., Bottger, 1984; Murphy, Blyth, & Fiedler, 1995; Podsakoff, Todor, & Schuler, 1983).

Since Katz' research (1955), the literature on leadership has suggested that task competence is important for project managers in engineering domains (e.g., Grant et al., 1997; Posner, 1987). It is also indispensable in a general management environment and correlates with leadership in a specific field (Aidar, 1989). For instance, Tsui (1984) showed that the head of an accounting department was generally more task-competent than his or her subordinates. However, it is not sufficient for the superior to possess task competence; his or her subordinates must identify and perceive the task competence so that the superior is a reliable resource for providing information and advice.

The subordinates' subjective perception of superior competence *(perceived task competence)* has received more attention than objective task competence (Hogan, Curphy, & Hogan, 1994). The empirical literature suggests that these sources of information are correlated with objective measures of effectiveness. For instance, Shipper and Wilson (1991) showed that the subordinates' ratings of superior competence were correlated with standards of productivity. In short-term interactions, perceived task competence is more important than objective task competence. However, over time, subordinate perceptions become more and more precise and subordinates test superior task competence.

When subordinates perceive their superior as task-competent, the superior position is accepted and perceived as legitimate. By definition, a legitimate high-dominance position implies the support of a significant portion of the individuals in the low-dominance position (Ridgeway & Berger, 1986). One of the status markers which affirm the legitimate system of

the hierarchy is the superior's task competence, particularly the subordinates' perception of superior task competence (Chemers, 2000; French & Raven, 1960; Hollander, 1985). According to the Expectation States Theorists (EST; Berger, Conner, & Fisek, 1974; Ridgeway & Berger, 1986), subordinates form *performance expectations* toward themselves and toward their superior. A performance expectation is a "generalized anticipation of one's own or another's capacity to make useful contributions to the task" (Ridgeway & Berger, 1986, p. 604). Thus, subordinates expect that their superior is task-competent and performs well. The high-dominance position must match with the task competence or at least with the perceived task competence in order for the superior to be perceived as effective. However, as aforementioned, being task-competent is not sufficient for a superior, being interpersonally competent is also necessary.

1.2.2 Interpersonal competence

Different theoretical models conceptualize interpersonal competence (also called social skills). Intelligence model theorists consider interpersonal competence as a form of interpersonal intelligence (Gardner, 1983) or emotional intelligence (Goleman, 1995). Other models view interpersonal competence in a broader perspective – competence approach (i.e., "psychological and behavioral characteristics influencing work and social life"; C. Kim, Min, Yune, Choi, & Gong, 2008, p. 222). The different constructs of interpersonal competence have considerable overlaps and share some degree of domain space.

For my thesis, *interpersonal competence* is defined as *the capacity to communicate clearly and effectively, to take the perspective of others, and to stay focused on the others' expectations* (Hogan & Warrenfeltz, 2003; Lombardo et al., 1988; McCall & Lombardo, 1983). This definition highlights two components of interpersonal competence – communication skills and interpersonal sensitivity (*Figure 2*). A person high in communication skills has the ability to initiate, build, and maintain relationships (Hogan & Warrenfeltz, 2003) and he or she has receptiveness and influencing skills. Interpersonal sensitivity is defined as accurately assessing an individual thoughts and feelings in others (J. A. Hall & Bernieri, 2001; Schmid Mast, Murphy, & Hall, 2006). Thus, taking the perspective of others and staying focused on the others' expectations both refer to interpersonal sensitivity. The following paragraphs describe these concepts, as well as how they can be measured or trained.

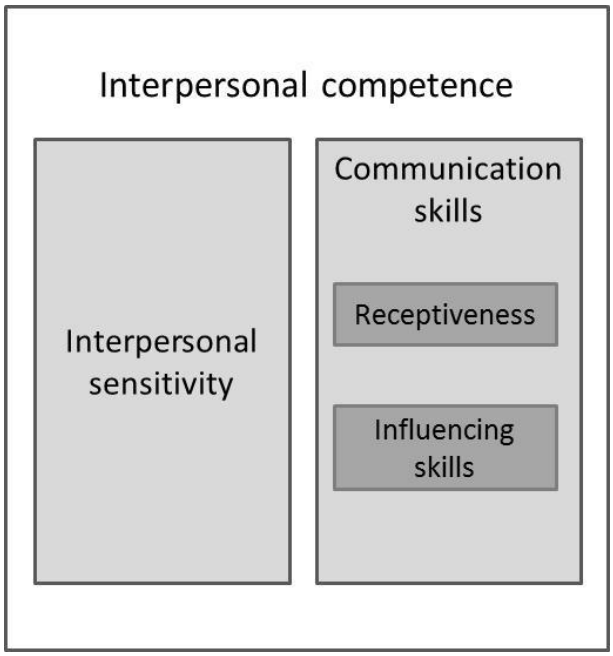


***Figure 2*. Interpersonal competence and its components**

---

a) Interpersonal sensitivity

In the context of the current research, interpersonal sensitivity is *the ability to access correctly another's states and traits* (J. A. Hall & Bernieri, 2001; Schmid Mast et al., 2006). An interpersonally sensitive individual not only understands other people's internal states but is also accurate at assessing other's thoughts, feelings, and their roles in social interactions. Research demonstrates that good interpersonal relationships are developed on the basis of interpersonal sensitivity (Riggio, 2001; Riggio & Zimmerman, 1991). In all interactions, drawing inferences about our (future) interaction partner is adaptive value.

Various instruments can be used to assess individuals interpersonal sensitivity (e.g., paper-and-pencil questionnaires or standardized tests). For instance, two of the six subscales (Emotional Sensitivity and Social Sensitivity) of Riggio's paper-and-pencil *Social Skills Inventory* (SSI; Riggio, 1986; Riggio & Carney, 2003) can be employed. Most often researchers use standardized tests. These tests include different types of judgments (e.g., emotion recognition, the assessment of intentions, thought reading) and different types of stimulus material (e.g., pictures, film scenes). *The standardized Empathic accuracy paradigm* (Ickes, 1997, 2001, 2003) is the test used in this research (Article 2, Study 2) to investigate how superior interpersonal sensitivity affects subordinate satisfaction. In this test, targets are filmed in an interaction and then, while reviewing the videotape, they indicate when they have had a specific feeling or thought. These videotapes are then watched by external observers

and stopped each time at the moment where the target reported having had a feeling or thought. Thus, observers have to decode what targets thought or felt at that specific moment. Accuracy of observers is assessed by comparing the actual feelings or thoughts (target) with the perceived feeling or thought (observer).

Concepts of interpersonal sensitivity are presented in many leadership theories. For instance, consideration behaviors (Ohio State Leadership Studies, section 1.2) include dimensions of interpersonal sensitivity such as showing concern for the feelings, attitudes, and needs of subordinates (Hollander, 1985; Riggio, 1996). Several of more modern leadership theories emphasize the importance of superior interpersonal sensitivity. For instance, as outlined previously, CCL researchers (McCall & Lombardo, 1983) showed that individuals in high-dominance positions failed often because they were insensitive. In superior-subordinate relationship, being interpersonally sensitive is important for understanding needs and feelings of each other (Yukl, 2010), and thus for facilitating the interaction. Additionnally, research has shown that superiors are more interpersonally sensitive than subordinates (Overbeck & Park, 2001; Schmid Mast et al., 2009). However, in order to be effective it is not sufficient for a superior to take the perspective of his or her subordinates and to stay focused on their expectations, the superior also needs to communicate clearly and effectively with them. Thus, besides being interpersonally sensitive, superiors should also be skilled in communication.

b) Communication skills

The use of communication is crucial in every work relationship and optimizes task performance (J. R. Hackman, 1989; Morey et al., 2002). The term of communication skills is widely used in research; however, its meaning varies depending on the researcher. Most often, communication skills refer to interpersonal skills (Hargie, 2006). To illustrate, according to Riggio, social skills and communication skills are interchangeable terms and can be measured with the entire SSI (Riggio, Riggio, Salinas, & Cole, 2003; Riggio & Taylor, 2000). However, communication skills are also a component of interpersonal competence (Fletcher et al., 2002). In my thesis (Article 3), I focus on two of these communication skills: receptiveness and influencing skills, which are required for the success of a task involving at least two individuals (Kanki, Helmreich, & Anca, 2010).

Receptiveness enables a person to pay attention to others and to encourage others to forward their ideas, comments, feedback, and questions. Receptive individuals ask questions, integrate others' suggestions into their decisions, encourage others' feedback, and listen

actively to others. Receptiveness refers also to openness in message receiving (Redding, 1972) and to upward communication (Clampitt & Downs, 1993). For instance, the superior is open to ideas from the subordinate and listens attentively to the subordinate. *Influencing skills* enable a person to obtain commitment from others by tactfully advocating a position and by using an appropriate level of assertion. Individuals who want to influence others use tact in their assertion. Influencing skills are an important element of superior-subordinate interaction (Jablin, 1979) and refers to downward communication (Clampitt & Downs, 1993). For instance, the superior gives subordinates instructions which lead to solutions in task-related problem.

In the current research, communication skills are trained. In general, communication skills can be trained with different methods. One method is the *Crew Resource Management Training (CRMT)* first introduced in 1979 (Cooper, White, & Lauber, 1980; Salas, Burke, Bowers, & Wilson, 2001). The CRMT focuses on interpersonal and cognitive non-technical skills. The goal of the training is to improve leadership, interpersonal communication, and decision making. This training is based on long-time experience in aviation and was mainly developed because of a recurrent lack of communication between crews on the flight deck (Flin, O'Connor, & Mearns, 2003). Nowadays, CRMT is used by all major international airlines (Flin et al., 2003) and in anesthesia and emergency medicine (Flin & Maran, 2004).

The CRMT is composed of six trainable categories (2001). *Situation awareness* refers to the perception, the comprehension of the environment, and the anticipation of it for future actions. *Team working* includes considering and supporting others, and focusing on the team. *Decision making* implies defining the problem, assessing and analyzing risks, and assessing outcomes. *Leadership* refers to planning and maintaining standards. *Personal resources* correspond to coping with stress and fatigue, physical and mental health. Finally, *communication* refers to asking, listening, and giving appropriate feedback to others.

Ideally, CRMT should focus on all these six aspects. However, inasmuch as there is no standardized CRMT (Salas et al., 1999), each aspect can be trained independently. When training only the specific communication category of the CRMT, one usually talks about CST, communication skills training, which is used in my thesis (Article 3) to examine its impact on superior-subordinate performance. CST can be taught with different tools or different combinations of them, such as theoretical approach, role play, exercises, case studies, lectures, video re-enactments of accident scenarios, or discussions (Flin et al., 2003).

To sum up, in my thesis I concentrate on the subordinate perspective on superior task competence and interpersonal competence. Interpersonal competence consists of interpersonal sensitivity (which is measured) and communication skills (which are trained). Although one can assume that there are some overlaps in the conceptualization of interpersonal sensitivity and communication skills (e.g., an interpersonally sensitive individual pays attention to others (*receptiveness*),) the two concepts are disentangled.

1.3 Potential outcomes of superior competence

In the current research, I am interested not only in the components of superior competence, but also in the consequences of superior competence for subordinates. More specifically, I study three main outcomes of superior competence: the subordinate's behavior (Article 1), the subordinate's satisfaction (Article 2), and the team performance (Article 3).

1.3.1 Subordinate behavior

In the superior-subordinate relationship, the most significant behavior is behavioral dominance (section 1.1). Behaviors referring to high or low dominance are well-documented in the literature (J. A. Hall et al., 2005). In my thesis, these behaviors are measured with the use of powerless speech and expressions of dominance (Article 1).

Powerless speech is an indicator of low dominance (Fragale, 2006; McFadyen, 1997; O'Barr & Atkins, 1980). It refers to "the frequent use of number of speech-style features (qualifiers, fillers, and hesitations) usually viewed as signs of tentativeness or uncertainty" (McFadyen, 1997, p. 407). The more individuals use powerless speech, the less they behave dominantly. *Expression of dominance* is an indicator of high dominance. A high-dominance expression involves expressing a strong personal opinion, contradicting or interrupting others, or taking the lead of the discussion. A low-dominance expression involves opposite behaviors, such as expressing that one does not have a preference (Schmid Mast & Hall, 2003). The more individuals use expressions of dominance, the more they behave dominantly.

Research has shown that individuals who have behavioral dominance generally occupy high-dominance positions (Berger, Webster, Ridgeway, & Rosenholtz, 1986; Ridgeway & Diekema, 1989) and subordinates are expected to behave submissively in accordance with their low-dominance position (de Reuver, 2006; Gioia, Donnellon, & Sims, 1989; Schmid Mast & Hall, 2003). Thus, prototypical behaviors of subordinates are submissive behaviors such as the use of more powerless speech and the use of less expression of dominance. However, these behaviors were observed only in a legitimate situation (i.e., when the superior

is perceived as task-competent; Ridgeway & Berger, 1986). Previous research did not investigate them in an illegitimate situation. In the current research, I investigate this issue.

1.3.2 Subordinate satisfaction

Subordinate satisfaction is understood as reflecting the overall attitude of a subordinate with regard to his or her job (Churchill, Ford, & Walker, 1974). It is defined by Locke (1976) as "... a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences" (p. 1304). Subordinate satisfaction represents one of the most consistent and widely used ways to evaluate organizational effectiveness (Robbins & Judge, 2009) and remains one of the most important indicators of leadership effectiveness (Bass & Bass, 2008). Subordinate satisfaction is a crucial factor for subordinate well-being (Faragher, Cass, & Cooper, 2005). It is mainly assessed with subjective measures, such as asking subordinates how satisfied they feel in their job, with their colleagues or superior.

For the current research, consistent with the meta-analytic literature on this topic (see Harter, Schmidt, & Hayes, 2002; Judge, Thoresen, Bono, & Patton, 2001), subordinate satisfaction refers to *satisfaction with the superior*. In this literature, researchers stress the significance of the superior and his or her impact on the subordinates' satisfaction with the organization. The subordinate's satisfaction with the superior explained most of the variance in long-term job satisfaction surveys.

Satisfaction is a goal in and of itself, but it might also have consequences for team performance (Locke, 1984). Subordinates who are not satisfied are less effective, which might decrease the team performance (Argyle, 1989; Judge et al., 2001).

1.3.3 Team performance

Team performance refers to a function of the correspondence between the task requirements and the team abilities (Motowidlo, 2003; Schwab & Cummings, 1970). It reflects "activities that are formally recognized as part of the job, support the organization's technical core, and directly impact organizational goal accomplishment" (Morgeson, Reider, & Campion, 2005, p. 548). It can be assessed with objective or subjective measures. Objective measures are for instance units of production, team members' accidents, absenteeism, turnover, whereas subjective measures are for instance the supervisor's rating or the client satisfaction. In the current research, performance is assessed with objective measures.

Several factors have been shown to predict good team performance, such as team members' abilities and behaviors (Morrow, Jarrett, & Rupinski, 1997). Team performance is

higher when team members have the knowledge and skills necessary to do the work and when they understand what to do and how to do it.

Most research on organizational psychology refers to team performance and not to dyadic performance (e.g., Dionne, Yammarino, Atwater, & Spangler, 2004; Likert, 1967). However, a two-people constellation can be viewed as a team (Salas, Dickinson, Converse, & Tannenbaum, 1992). I therefore assume that in a superior-subordinate relationship *dyadic performance* can be measured similarly as team performance (e.g., Schmid Mast, Hall, & Schmid, 2010). In the current research, I focus on the effects of (in)competence on dyadic performance (Article 3).

Subordinate satisfaction and team performance are highly interrelated (Judge et al., 2001) referring both to leadership effectiveness. *Leadership effectiveness* can be defined as the superior effects on subordinate satisfaction or team performance (Kaiser, Hogan, & Craig, 2008). In my thesis, I use the term of leadership effectiveness when I outline research on satisfaction and performance.

1.4 Dyadic tasks

The subordinate's prototypical behavior and leadership effectiveness can be observed only when the superior and the subordinate interact to perform a particular task. There are different types of task which can be achieved by a superior-subordinate dyad.

Many theoretical frameworks have classified team or dyad tasks on the basis of significant features. For instance, Steiner (1972) distinguishes four classes of tasks – additive, conjunctive, discretionary, or disjunctive tasks. *Additive tasks* refer to one single task completed by each team member although the end result is attributed to the entire team (e.g., brainstorming). In additive tasks, performance is independent of the distribution of task competence among team members (Devine & Philips, 2001). The overall performance depends on the sum of each team member's effort. *Conjunctive tasks* consist in different but related tasks in order to achieve a specific goal (e.g., an assembly chain). In an assembly chain, each individual's performance depends on the individual previous in line. Performance of the overall team is as good as the performance of its least task-competent member. In *discretionary tasks*, team members combine their resources. This type of task is specific to self-managed work teams because only those teams have the authority to decide how to combine their resources (English, Griffith, & Steelman, 2004). Finally, *disjunctive tasks* refer to a task which is completed when a unique solution is approved by the team (e.g., aptitude

game or problem-solving task). The overall performance of the team is as good as the performance of the most task-competent member.

In my thesis, I concentrate on superior-subordinate interaction in disjunctive task, specifically in a problem-solving task for two reasons. Many team tasks are of the disjunctive nature (Littlepage, 1991) and the success of disjunctive task depends on how well the most task-competent team member does (Steiner, 1972). In the next sections, I describe two of the most widely used problem-solving tasks in experimental research: survival problem tasks and simulations of complex tasks.

1.4.1 Survival problem tasks

Survival problem tasks are widely used for experimental research on team processes, decision making processes, and team performance (e.g., Bottger, 1984; Bottger & Yetton, 1988; Fragale, 2006; Roch & Ayman, 2005). Individuals are put in a hypothetical situation in which they are, for instance, on a deserted island and have to survive. In the first phase, individuals read a particular scenario in which they have to rank items for their survival according to the importance of the suggested items. In the second phase, the dyad or the team members have to share one by one their ranking, and a consensual decision has to be made.

Survival problem tasks can be used in different contexts. For instance, since the 70s, researchers have used this task in a desert context (Desert Survival Problem; Lafferty, Eady, & Elmers, 1974), in a space context (NASA Moon Survival Problem; J. Hall, 1978), or in a sea context (Lost at Sea; Nemiroff & Pasmore, 1975). All of these tasks possess a correct solution provided by experts.

Survival problem tasks have been used in experimental research on leadership. Murphy and colleagues (1995) showed that a directive and task-competent superior led his or her team to high performance in a survival problem task. Riggio and his colleagues (2003) demonstrated that in such a task, talkative and extraverted individuals emerged as leaders. More recently, Schmid Mast and colleagues (2009) showed that superiors were more interpersonally sensitive than subordinates during a survival problem task.

Survival problem tasks are a useful tool for investigating superior-subordinate relationships. The decision making process involved in this task allows for the analysis of the black box between the problem and the solution (Stogdill, 1974). Researchers can also look at specific aspects of superior-subordinate relationships, such as superior or subordinate competence and influence. For example, Butera and his colleagues investigated these

outcomes in the context of peer relationships (Butera et al., 1998; Butera, Maggi, Mugny, Pérez, & Roux, 1996). In the present research, survival problem tasks are used as the problem-solving task in Article 1 to investigate the perceptions and behaviors of subordinates interacting with a task-incompetent superior and in Article 2 (Study 2) to examine how superior interpersonal sensitivity affects subordinate satisfaction.

1.4.2 Simulation of complex tasks

Another disjunctive task is the simulation of complex tasks. An example of a complex task is piloting an airplane. Its complexity lies in the fact that several goals must be achieved simultaneously and closely joined processes are present in the system (Sauer, Wastell, & Hockey, 2000). A lot of experimental studies on team processes, team communication, and team performance have used computer simulations of complex tasks. Complex tasks need rapid decision-making processes, due to the permanent changes of system state (e.g., altitude, speed). Thus, using these simulations in research on superior-subordinate interaction allows focusing on the potential decision-making processes done by the dyad.

Most simulations of complex tasks are based on aeronautics as for instance *the Cabin Air Management System* (CAMS) task which was developed as part of the European Space Agency's (ESA) research. CAMS task is a generic simulation of a spacecraft's life support which is highly automated. This system contains five automatic subsystems that maintain the main parameters (O^2, CO^2, cabin pressure, temperature, and humidity) within a predefined target range. Operators must observe the system and intervene when there is a risk for the safety (e.g., imbalance of CO^2 regarding the other parameters). CAMS was used in research on teams in order to gain a better understanding of the factors that predict team performance in complex systems, such as sleep deprivation, noise impairment, period of non-practice, isolation (Hockey, Wastell, & Sauer, 1998; Sauer, Hockey, & Wastell, 1997; Sauer, Wastell, & Hockey, 1999). A detailed description of CAMS may be found in Sauer, Wastell, and Hockey (2000). In my thesis, the CAMS task is used as problem-solving task in Article 3 to examine how superior-subordinate dyads perform according to superior and subordinate task (in)competence.

1.5 Summary

In the first chapter, I introduced the main components and outcomes of the superior-subordinate relationship. I showed that the superior-subordinate relationship is a dyadic and vertical process in which the dominance perception and behaviors of superior and subordinate might vary. In this context, the superior should be task-competent (i.e., possessing domain-

specific knowledge) and interpersonally competent (i.e., being interpersonally sensitive and skilled in communication). Task competence or the perceived task competence can both place a superior in a legitimate position (Chemers, 2000; French & Raven, 1960; Hollander, 1985). In this situation, subordinates have prototypical submissive behaviors and this situation leads to leadership effectiveness (i.e., subordinate satisfaction and dyadic performance) in a disjunctive task (i.e., problem-solving task). Figure 3 depicts this process.

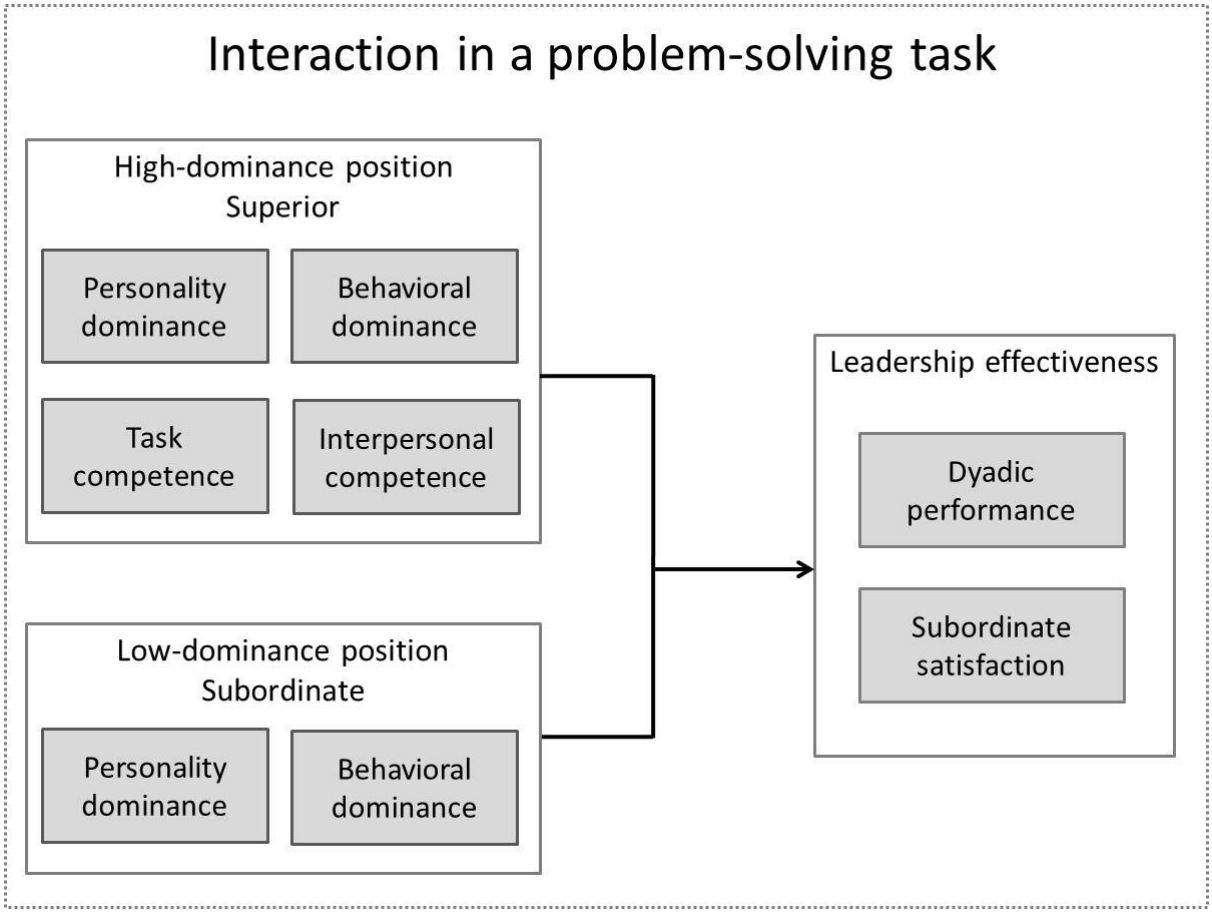


***Figure 3*. Superior-subordinate relationship and its process through a problem-solving task**

In the next chapter, I concentrate on the three empirical studies included in my thesis. The overarching goal of the next sections is to clarify the effects of the (mis)match between a high-dominance position and competence (task and interpersonal) on subordinate perceptions, behaviors, and satisfaction, as well as on dyadic performance.

2 (Mis)Match Between High-Dominance Position and Competence

In this chapter, I explain how subordinates perceive and behave when there is a mismatch between their superior's position and competence, for instance when the superior is task-incompetent in a problem-solving task (sections 2.1). I further examine whether indiviudals expect that interpersonal sensitivity is a specific superior's characteristic and how the superior's interpersonal sensitivity affects subordinate satisfaction (section 2.2). Finally, I demonstrate how matched and mismatched task-competent superior-subordinate dyads perform and how communication skills training impacts the relation between mismatching and dyadic performance (section 2.3). Thus I shed a new light on the superior-subordinate interaction – particularly on how subordinates perceive, act toward, and are influenced by a superior who can be task-(in)competent and interpersonally (in)competent.

2.1 Impact of task competence on subordinate

In this section, I show that the task competence or incompetence of a superior influences leadership effectiveness, as well as the subordinate's perception of the superior and the subordinate's behaviors (Article 1).

Research has demonstrated that when the superior is task-competent, it leads to leadership effectiveness. It is well-established that superior task competence contributes to team success (Hollander, 1978; Likert, 1961), whereas superior task incompetence negatively affects team outcomes. For instance, Katz and Kahn (1952) showed that the superior's competence perceived by subordinates is positively related to the subordinates' satisfaction with their superior. According to Hamblin and colleagues (1961), subordinates perceiving their superior as task-incompetent have low morale. Morale is the capacity of a team to pull together persistently and consistently in pursuit of a common goal. Manifestations of morale are, among others, satisfaction with the superior and satisfaction with task. The decrease in morale will reduce productivity and increase turnover and strikes. Moreover, it is well-documented that superior competence has a real impact on team performance (Avolio, 1999; Bass, 1985). Justis, Kedia, and Stephens (1978) showed in a training context how a trainer's high-dominance position together with task competence impinge on the trainee's level of performance. Results revealed that the level of trainee performance decreased when the task-incompetent person was in charge. More recently, Murphy and colleagues (1995) showed that superior task competence contributed to team performance only if the superior received technical training and told the team how to do the job. Further, Schmid Mast and colleagues

(2010) showed that the subordinate's characteristics play a less obvious role for the dyad's task performance than the superior's ones.

These examples demonstrate that to be effective, superiors should know and understand the tasks of their subordinates and should be able to make decisions based on that knowledge. However, in some cases, the high-dominance position might mismatch with the level of task competence. For instance, an experienced sea-captain may be employed as first mate on another boat which is viewed as a low dominance and low task competence demanding position. He or she will be under the order of another sea-captain who might be not as well-experienced as him or her. Having a high-dominance position without the corresponding task competence is likely to be treated as a violation of legitimacy, and this high-dominance position may not be accepted by subordinates (Van Vugt et al., 2008). Although superiors are freer to break group norms compared to subordinates (Cohen & Lee, 1975), they are not free to break the performance expectation which is one of the defining features of their high-dominance position (Ridgeway, 1978). Because the subordinates' perception of superior task competence legitimizes the superior position (Chemers, 2000; French & Raven, 1960; Hollander, 1985), it is assumed that the subordinates can also delegitimize the superior position when they perceive the superior as task-incompetent. Subordinates habitually attribute success or failure more to the superior's task competence (personal quality) than to situational factors beyond the superior's control. Thus, occupying the high-dominance position is perceived as illegitimate and might have a negative impact on leadership effectiveness (i.e., subordinate satisfaction and team performance).

Aforementioned research has established that superior task competence or the perceived lack thereof by subordinates affects leadership effectiveness. However, how subordinates perceive a task-incompetent superior and how they act toward their task-incompetent superior is under-examined. Research on the source's (interaction partner) task competence and the target's perceptions and behaviors is focused mainly on peer interactions. Butera and his colleagues (Buchs & Butera, 2009; Butera, Caverni, & Rossi, 2005; Butera, Maggi, et al., 1996; Butera & Mugny, 1995; Mugny, Butera, Quiamzade, Dragulescu, & Tomei, 2003) examined the dynamic during a dyadic interaction in a problem-solving task manipulating the level of task competence within the dyad. In an interaction involving pairs of teenagers, Butera and Mugny (1995) showed that task-incompetent individuals who perceived the interaction partner as task-incompetent doubted the validity of their own solution and changed their way of thinking more often than individuals in the other dyads' constellations (i.e., task-competent target vs. task-incompetent source, task-competent target vs. task-competent

source, task-incompetent target vs. task-incompetent source). In the same vein, Butera et al. (2005) showed that interacting with a task-incompetent peer could increase the elaboration of new solutions.

Thus, from research on peer-dyad, I expect that in a hierarchical interaction superior task competence affects the subordinate's perceptions and behaviors. Some researchers empirically examined interactional dynamics in a superior-subordinate interaction. For instance, Hollander's results (1985) revealed that in teams, members respected more the directions of superiors who are perceived as task-competent. Further, it has been demonstrated that a task-competent superior has a greater influence on subordinates than a less task-competent one, especially when subordinates are task-incompetent (Price & Garland, 1981). More recently, Ferguson and her colleagues (Ferguson, Ormiston, & Moon, 2010) provided some ideas on how subordinates behaved toward a task-incompetent superior. When subordinates perceived their superior as task-incompetent, they avoided to interact and to enter into conflict with the superior. However, in organizational contexts it is difficult to avoid interacting with the superior. According to Jablin (1985), superiors spend between 35 and 65% of their time interacting with their subordinates. Thus, I assume that in an interaction between a subordinate and a task-incompetent superior, the subordinate has a specific perception of the task-incompetent superior and specific behaviors toward the superior as demonstrated in the first article described hereunder.

- **Article 1: Facing an incompetent leader: The effects of a non-expert leader on subordinates' perception and behavior**

In two studies, we investigated the impact of having a task-incompetent superior on the subordinate's perception of and interaction with his or her superior. For this research we focused on two particular factors: subordinate perception of superior dominance and subordinate behavioral dominance toward superior. As outlined in section 1.1, these two aspects of subordinate perceptions and behaviors are relevant in the superior-subordinate relationship.

The present hypotheses were based on different theoretical backgrounds. First, in section 1.3.1, I mentioned that subordinates prototypically behave submissively (i.e., more powerless speech, less expression of dominance) in a legitimate situation (with a task-competent superior). However, when superiors lose their legitimacy because they are task-incompetent, it is seen as a declining of their dominance position (Expectation States Theory; Ridgeway & Berger, 1986). According to Lammers, Galinsky, Gordijn, and Otten's meta-

analysis (2008), in an illegitimate situation, the behavioral dominance of both the superior and the subordinate are affected, such that superiors show less approach behavior than subordinates; whereas their subordinates show more approach than the superiors. Approach is viewed as a dominant behavior (Magee & Galinsky, 2008). Thus, we assumed that in the situation of superior task incompetence, the superior would behave less dominantly because of the illegitimate situation and the subordinate would perceive this lack of dominance (Hypothesis 1). Furthermore, according to the complementarity theory (Tiedens, 2001; Tiedens & Fragale, 2003; Tiedens & Jimenez, 2003), individuals behave more dominantly in peer groups with a less dominant interaction partner and behave less dominantly with a more dominant one. Thus, we assumed that the subordinate would behave more dominantly when he or she is interacting with a task-incompetent superior than with a task-competent superior, given that a task-incompetent superior is perceived as less dominant than a task-competent superior (Hypothesis 2). Moreover, Wehr, Burgess, and Burgess (1994) showed that the subordinates of illegitimate superiors resisted and challenged more frequently the superiors' decisions and instructions than the subordinates of legitimate superiors. Thus, we assumed that the subordinate would resist the task-incompetent superior's influence more when he or she is interacting with a task-incompetent than with a task-competent superior (Hypothesis 3). Moreover, we hypothesized that perceived superior dominance would mediate the relations between superior task incompetence and subordinate behavioral dominance (Hypothesis 4), and between superior task incompetence and subordinate resistance (Hypothesis 5). Figure 4 depicts the hypotheses of the two studies.

These expectations were explored through a superior-subordinate interaction on a problem-solving task, *the First Aid Kit Problem*. Its process is similar to survival problem tasks presented in section 1.4.1 (e.g., NASA Moon Survival Problem, which has been frequently used in research; Linkey & Firestone, 1990; Orpen, 1995). Participants had to create a first aid kit with various products (e.g., sunscreen cream, bandages, mosquito lotion) in order to travel four weeks in Peru (Andes mountain range, Amazon rainforest). Because of lack of space in the luggage, the task of the individuals was to rank the items from 1 to 12 (or 8 in Study 2) according to their importance, based on the country's inherent conditions.

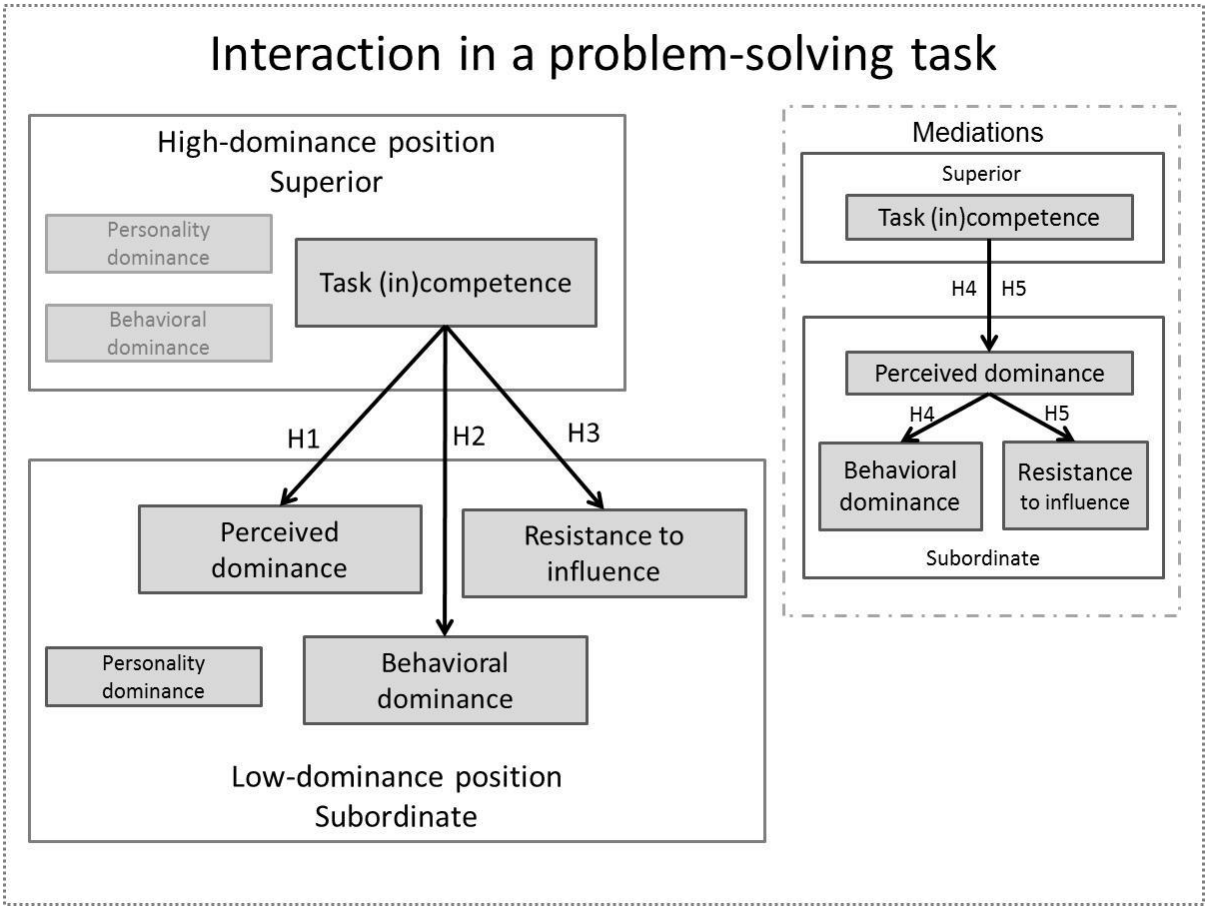


***Figure 4*. Schema of the hypotheses of Article 1**
Subordinates would perceive the superior task incompetence as a lack of dominance (H1), would act with more behavioral dominance (H2), and resist more superior influence (H3). Perceived superior dominance would mediate the relations between superior task incompetence and subordinate behavioral dominance (H4), and between superior task incompetence and subordinate resistance (H5).

In Study 1, participants interacted via email with a bogus male superior, through a scripted computer program. In Study 2, participants were involved in a face-to-face interaction with one of three trained male confederates as superior. The part of the superior was played by a man, due to the higher incidence of men in leadership positions. In the US, only 2% of CEO and 15% of directors are women. In the European Union, the 50 largest public organizations in each country women account for only 4% of CEOs and 11% of the top executives (Eagly & Carli, 2007). In Switzerland, 68% of superiors in organizations are men (Bläuer, Laessig, Moser, & Vuille, 2009).

Task competence of the superior was manipulated in both studies by indicating that the superior was either an expert or a novice in the matter to discuss. This manipulation has been often used in this type of research (e.g., Butera et al., 2005; Fischer-Lokou & Guéguen, 2000). Participants indicated how dominant they perceived the superior to be. Ratings of the participants' behavioral dominance (i.e., powerless speech and expression of dominance)

were performed by external judges. To determine the resistance to influence, we summed up the score on each item of the absolute difference between the superior's ranking and the subordinate's initial ranking (= initial gap), and we also calculated for each item, the absolute difference between the superior's ranking and the subordinate's final ranking (= final gap). We then subtracted the scores of the final gap from those of the initial gap. For all analyses, personality dominance was entered as a covariate to control for its potential influence, as underlined in section 1.1. We confirmed our expectations in both studies indicating that there are stable results which can be found with different methodological approaches.

We found that subordinates interacting with a task-incompetent superior perceived him as less dominant. This confirms the predictions based on the Expectation States Theory (EST, Ridgeway & Berger, 1986). Task incompetence was interpreted as an indicator of a low-dominance. We also found that subordinates interacting with a task-incompetent superior behaved more dominantly and resisted more the superior's influence. Moreover, results showed that perceived superior dominance mediated the relations between superior task competence and subordinate behavioral dominance, and between superior task competence and resistance to superior influence. With these results, the present studies showed that when a subordinate is forced to interact with a task-incompetent superior, he or she compensates by adapting his or her dominance behavior. These results add to the existing literature from Ferguson et al. (2010), which found that individuals in low-dominance positions were more likely to avoid interactions with task-incompetent individuals in high-dominance position. Additionally, Article 1 showed that subordinates did not behave prototypically toward a task-incompetent superior. They used less powerless speech and more expressions of dominance than subordinates interacting with a task-competent superior. Thus, the illegitimate situation reverses the subordinate's behavioral dominance observed in a legitimate situation.

It is interesting to speculate on what mediates the relationship between perceived superior dominance and subordinate behavioral dominance. To introduce the hypotheses, I have drawn upon both the complementarity theory (Tiedens, 2001; Tiedens & Fragale, 2003) and the legitimacy or illegitimacy perspective (Lammers et al., 2008). However, the question why exactly the subordinate behaved more dominantly has not yet been answered. We do not know whether the participants behaved dominantly primarily because they felt the submissive superior was illegitimate or because the interaction felt more comfortable if they took a dominant approach. Future research might want to investigate this aspect.

2.2 Impact of interpersonal competence on subordinate

Although the superior's task competence plays an important role in leadership effectiveness and on subordinates' perceptions and behaviors, it is not enough for a superior to be only task-competent. As outlined in section 1.2.2, interpersonal competence is also important. As an example, when superiors give instructions (linked to the task competence), they need interpersonal competence so that this action reflects not only a concern for task-objectives but also an interest for subordinates. In this section, I demonstrate that the interpersonal competence and incompetence (i.e., interpersonal sensitivity or communication skills) of a superior influences leadership effectiveness. With Article 2, I show more precisely that an interpersonally sensitive superior influences the subordinate's satisfaction.

How superiors interact with their subordinates has been suggested as an important factor for leadership effectiveness (e.g., Burns, 1978; Mintzberg, 1973; Riggio & Reichard, 2008). For Boyatzis (1982), effective and ineffective superiors are differentiated by interpersonal competence, regardless of the situation. Thus, high-dominance position and interpersonal competence should match so that the superior is effective and is perceived as effective whatever the environment complexity (i.e., type of organization, its size, or the level of superior in the organization). According to McCall and Lombardo (1983), superiors who fail are weaker in interpersonal competence than superiors who succeed. Riggio and his colleagues (2003) provided support for the idea that higher social skills of the superior (similar to interpersonal competence) lead to more satisfied but not more effective subordinates. Additionally, superiors who were skilled in sending and receiving messages and in controlling communication were evaluated as more effective by their subordinates. Further, some research on emotional intelligence (close to interpersonal competence; Goleman, 1995) demonstrated a positive impact of superior emotional intelligence on their subordinates in terms of increased levels of satisfaction (Langhorn, 2004; Wong & Law, 2002) and of performance (Prati, Douglas, Ferris, Ammeter, & Buckley, 2003; Wong & Law, 2002). It is important to understand more precisely the influence of the two main aspects of interpersonal competence (i.e., interpersonal sensitivity and communication skills) on leadership effectiveness by looking at research which disentangles these two features.

The effects of interpersonal sensitivity on leadership effectiveness are not well-documented, although there has been some preliminary research showing that superiors are more interpersonally sensitive than subordinates (e.g., Overbeck & Park, 2001; Schmid Mast et al., 2009), and that superiors possessing low levels of interpersonal sensitivity failed (McCall & Lombardo, 1983). For instance, Riggio and his colleagues (2003) showed that the

interpersonal sensitivity of the superior (i.e., emotional and social sensitivity) does not lead to a higher team performance. However, it remains unclear what the effects of interpersonal sensitivity are on subordinates' satisfaction.

Consequently, the studies reported hereunder were designed to contribute to the literature on superior interpersonal sensitivity. In Study 1, we tested whether superiors are expected to be more interpersonally sensitive than subordinates, apart from the fact they are actually more interpersonally sensitive than their subordinates (e.g., Overbeck & Park, 2001; Schmid Mast et al., 2009). In Study 2, we examined the effects of a superior's interpersonal sensitivity on subordinates' satisfaction.

- **Article 2: On the importance of the superior's interpersonal sensitivity for good leadership**

Individuals most likely do not harbor the same expectations vis-à-vis an individual in a high- versus low-dominance position. Previous research showed that subordinates had expectactions on prototypical superior behaviors such as giving ideas to the team, being responsible, and accepting others (Kenney, Blascovich, & Shaver, 1994; Lord, Brown, Harvey, & Hall, 2001). However, the question as to whether these expectations include interpersonal sensitivity has not yet been investigated. In Study 1, we hypothesized that individuals would expect more interpersonal sensitivity from effective superiors than from effective subordinates (Hypothesis 1). In order to answer this question, participants were asked to fill in a questionnaire measuring to what extent they agreed that interpersonal sensitivity was desired from either an effective superior or an effective subordinate. The gender of effective superior or subordinate was not specified. Results revealed that interpersonal sensitivity is a skill expected more from effective superiors than from effective subordinates.

In Study 2, we focused on subordinate satisfaction. As a reminder, subordinate satisfaction represents one of the most consistent and widely used ways to evaluate leadership effectiveness (Robbins & Judge, 2009) and it constitutes an important determinant for subordinate general well-being, more so than subordinate performance (Faragher et al., 2005). Moreover, unlike performance, subordinate satisfaction can be assessed in the same manner in each organization, regardless of tasks, structures, or environmental context. It is also well-established that subordinate satisfaction is related to job performance (Judge et al., 2001). We hypothesized a relation between superior interpersonal sensitivity and subordinate satisfaction (Hypothesis 2). Upon arrival, participants were run in dyads and were randomly assigned to

be either the superior or the subordinate. Contrary to the two studies of Article 1, both men and women were in the position of the superior in this study. After interacting in a problem-solving task (described in section 1.4.1), participants completed questionnaires designed to measure their satisfaction based on the interaction. Superiors also watched 3-min of a video-based interpersonal sensitivity test (the standardized Empathic accuracy paradigm videotape described in section 1.2.2; Ickes, 2001, 2003) and reported their perceived feelings or thoughts of the subordinate target in the video. This task was completely independent of the interaction excluding possible contamination and avoiding the confounding of the targets' expressiveness with the perceivers' interpersonal sensitivity (J. A. Hall, Rosip, Smith LeBeau, Horgan, & Carter, 2006). The interpersonal sensitivity of the participants (superiors) was assessed by comparing the actual feelings and thoughts of the subordinate target (in the video) with the perceived feelings and thoughts of the superior. Results showed that the objective interpersonal sensitivity of participants in the superior role was positively related to the perceived satisfaction of the participants in the subordinate role. Thus, Hypothesis 2 was confirmed. This contributes to the research on interpersonal sensitivity and leadership effectiveness by showing that individuals expect that an effective superior is interpersonally sensitive and this interpersonal sensitivity leads to subordinate satisfaction. A next step would be to investigate the impact of superior interpersonal sensitivity on subordinate perception and behaviors during the problem-solving task. Future research should investigate whether the findings of Article 1 on task competence can be replicated for interpersonal competence.

The present studies did not take into account the superior's communication skills. It is possible that the superiors who are interpersonally sensitive have more communication skills, because they have the ability to infer their subordinates' feelings and thoughts. Moreover, interpersonal sensitivity might moderate the impact of communication skills on leadership effectiveness. Thus, future research should investigate whether the communication skills of higher interpersonally sensitive superiors differ from lower interpersonally sensitive superiors.

Several studies have investigated the general relationship between the superior's communication skills and leadership effectiveness. With respect to research on subordinate satisfaction, it is well-established that the superior's communication skills (i.e., receptiveness and influencing skills) are highly correlated with subordinate satisfaction (e.g., Clampitt & Girard, 1986; Lee, 1989). In an employees' survey, Sharbrough, Simmons, and Cantrill (2006) found a positive link between superior communication skills and their subordinates' job satisfaction. Some authors have highlighted that superior receptiveness is a crucial factor

of subordinate satisfaction (Jablin, 1978; Likert, 1967). Concerning the link between superior communication skills and team performance, some studies have demonstrated that higher team effectiveness is linked to a better communication skilled superior (Jain, 1973; Jenkins, 1977; Willits, 1967). Thus, the link between superior communication skills and leadership effectiveness (i.e., subordinate satisfaction and team performance) is well-documented. In the next section, I go a step further by focusing on the impact of communication skills training (CST) within superior-subordinate dyads on leadership effectiveness.

2.3 Impact of task competence distribution and communication skills training on subordinate

In this section, I give an overview of past research related to the distribution of task competence, communication skills training within dyads and their impacts on leadership effectiveness. I also present a relevant contribution (Article 3) to this realm of research.

As a reminder, the Expectation States Theory (EST; Berger et al., 1974; Ridgeway & Berger, 1986) suggested that in order to be in a legitimate situation and to be accepted by subordinates, the superior has to be task-competent. Furthermore, research shows that the superior's task competence or task incompetence affects performance (Justis, 1975; Murphy et al., 1995). However, this entire body of research has focused on superior task competence without explicitly taking into account the task competence of subordinates. It was assumed that subordinates were at the same level of incompetence as the task-incompetent superior, but it has never been assumed that subordinates were more task-competent than the task-incompetent superior. In superior-subordinate dyads, the dominance position should match the task competence. One expects that superiors are task-competent and that subordinates are less task-competent than superiors (Vonk & Konst, 2003). However, this is not always the case in reality and although superior task competence is the most important variable affecting leadership effectiveness (Ferguson et al., 2010), when investigating dyadic performance, it seems important to also include subordinate task competence.

There is little research in which the subordinate's task competence was controlled. Price and Garland (1981) manipulated the superior's task competence and the team's task competence in order to show that a task-competent superior has a greater influence on a task-incompetent team than a less task-competent superior. Moreover, in the research presented in Article 1 (section 2.1), the subordinate's task competence was controlled by ensuring that each individual was at least less task-competent than the high task-competent superior and not more task-competent than the task-incompetent superior.

Research on dyadic theory has demonstrated that when the superior and the subordinate both perceived the other as task-competent or task-incompetent, it led to a better quality of superior-subordinate exchanges than when the superior perceived the subordinate as task-incompetent and the subordinate perceived the superior as task-competent, or vice-versa (Snyder & Bruning, 1985). Additionally, a large amount of research was done on the distribution of task competence within the dyad during peer interactions. For instance, as outlined previously, Butera and his colleagues (Buchs & Butera, 2009; Butera et al., 2005; Butera, Maggi, et al., 1996; Butera & Mugny, 1995; Mugny et al., 2003) have manipulated the level of task competence within the peer dyad in order to examine the dynamic during a dyadic interaction in a problem-solving task. However, these authors did not look at dyadic performance. Hitherto no studies were conducted to investigate the effects of the distribution of task competence within superior-subordinate dyad on leadership effectiveness. However, one could expect an effect of the distribution of task competence within superior-subordinate dyad on dyadic performance. Past research showed that when a less task-competent individual compares him- or herself to another more task-competent individual, it leads to better individual performance (Huguet, Dumas, Monteil, & Genestoux, 2001; Huguet, Galvaing, Monteil, & Charbonnier, 1999; Seta, 1982).

Besides the distribution of task competence, communication skills training (CST) might also improve the dyadic performance. CST has been applied to a range of professionals. CST research is especially extensive for medical care (e.g., Brown, Boles, Mullooly, & Levinson, 1999; Evans, 2010; Hargie, Dickson, Boohan, & Hughes, 1998) and for aviation personnel (e.g., Baker, Prince, Shrestha, Oser, & Salas, 1993; Droog, 2004; Helmreich, Merritt, & Wilhelm, 1999). There are large variations in approach of CST, type and length of training, total training time, and so on. CST has to be adapted to each team according to the team's specific needs (Dickson, Hargie, & Morrow, 1997).

In a team context, meta-analyses (Salas et al., 2008; Salas, Nichols, & Driskell, 2007) showed a tendency for CST to lead to an increase in team performance. Moreover, according to Papa and Graham (1991), in the organizational context, superiors trained with communication skills achieved higher ratings on interpersonal competence, problem-solving ability, and productivity. Other researchers revealed positive effects of CST on organizational effectiveness (Tavernier, 1980; Tubbs & Widgery, 1978).

The CST used in this research is a part of the Crew Resource Management Training (CRMT) described in section 1.2.2. CRMT focuses not only on superior skills but also on subordinate skills. The majority of CRMT research examines the effects of the global CRMT

(i.e., 6 trainable categories) on team performance by looking at process variables (e.g., cooperation, cohesiveness). Although a chief goal of CRMT is to improve the dyadic communication, no research was found using only the CST (i.e., one of the 6 CRMT categories which focuses on receptiveness and influencing skills). However, previous research on CRMT tended to indicate a strong relationship between CST and team performance. For instance, McIntyre, Morgan, Salas, and Glickman (1989) found that effective teams demonstrated more episodes of communication than ineffective teams. In their review of commercial flight teams, Orasanu and Salas (1993) reported a positive link between the communication amount and type on the one hand and the team performance on the other hand. The same result was found by Leedom and Simon (1995) on Army aircrews. CRM trained teams improved performance compared to teams not trained. Thus, CST in CRMT might have an impact on dyadic performance.

Consequently, there is evidence that superior task competence legitimates the high-dominance position and that it is beneficial for dyadic performance. However, there is a lack of research examining the distribution of task competence within the superior-subordinate dyad and its impact on dyadic performance. Moreover, previous research has focused on the incremental value of CST on team task competence (Salas et al., 2008; Salas et al., 2007), but never tested whether CST has the same incremental value when there is a mismatching between superior task competence and his or her high-dominance position. Improving communication skills of a mismatched dyad with training might be beneficial and improve dyadic performance. This is why we conducted the next study.

- **Article 3: A multi-level approach of evaluating crew resource management training: A lab-based study examining communication skills as a function of team congruence**

In this article, we investigated the effects of CST on incongruent (task-incompetent superior with task-competent subordinate) and congruent dyads (task-competent superior with task-incompetent subordinate) on dyadic performance within the Cabin Air Management System (CAMS) described in section 1.4.2.

We expected that congruent dyads were more effective than incongruent ones (Hypothesis 1) as suggested by research looking only at superior task competence (Justis, 1975; Murphy et al., 1995). As previously demonstrated (Salas et al., 2008; Salas et al., 2007), we expected that CST would overall improve dyadic performance (Hypothesis 2). Further, we expected that the CST would improve more strongly the performance of incongruent dyads

than of congruents dyad (Hypothesis 3), because the task-incompetent superior needs to be receptive in order to accept the subordinate's suggestions and the task-competent subordinate needs to be influencing to share his or her task-related knowledge. In the opposite constellation, if the superior is task-competent, he or she may not need (or at least to a lesser extent) to use his or her interpersonal competence and to communicate with his or her task-incompetent subordinate. Thus, CST becomes useless in congruent dyad. In Figure 5, I depict these hypotheses.

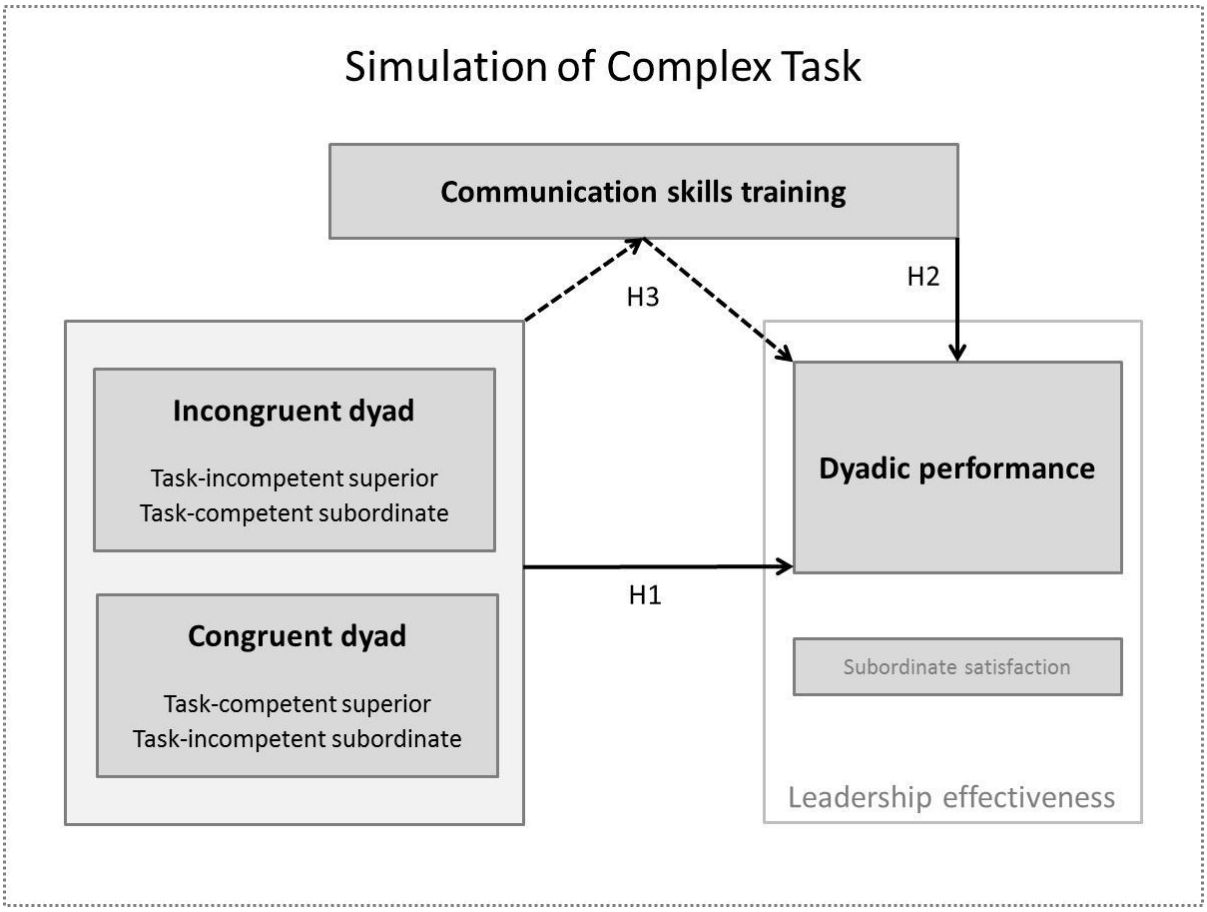


***Figure 5*. Schema of the hypotheses of Article 3**
Congruent dyads would be more effective than incongruent ones (H1). CST would overall improve dyadic performance (H2). CST would improve more strongly the performance of incongruent dyad than of congruent dyad (H3)

Participants were randomly assigned to either the superior or subordinate role. Because worldwide statistics show that men are more accepted in the superior role (Bläuer et al., 2009; Eagly & Carli, 2007), all participants were men. Participants worked in dyads on the CAMS task. The main task of participants was to observe the system and to intervene when there was a risk to safety (e.g., imbalance of CO^2 regarding the other parameters). Moreover, the participants were in charge of four process control tasks divided into primary and secondary tasks. The primary tasks had to be done before the secondary ones in order to keep the system

safe. The two primary tasks were system stabilization and fault diagnosis (identification and reparation). The two secondary tasks were responding to system alarms and carrying out status checks at regular intervals. All participants received a basic training on standard faults that may occur during the CAMS task. Task-competent individuals were additionally trained on a complex fault of the CAMS, which was unfixable, but manageable, whereas task-incompetent individuals were exclusively trained on standard faults. Dyads were formed with a task-incompetent superior and a task-competent subordinate (incongruent dyad), and with a task-competent superior and a task-incompetent subordinate (congruent dyad).

Half of the dyads received a CST. This training consists of three parts: First, participants watched a video re-enacting the Tenerife airport disaster, then discussed the characters' correct and incorrect behaviors, the consequences of their behaviors, and the possibilities of improvement. Second, they received a short theoretical presentation on receptiveness and influencing skills. Third, they had a role play in order to implement what they had just learned. The other half of the dyads was not trained on communication skills and watched and discussed an unrelated documentary about climate research in Greenland.

There were several dyadic performance measures for the CAMS. We assessed performance on primary tasks by counting the number of errors on system stabilization and fault diagnosis. We measured performance on secondary tasks by counting the number of errors made concerning the record of the percentage of O^2 in the tank level (i.e., *prospective memory error).* Prospective memory refers to remembering to do an action at a specific moment. Finally, dyadic performance could be measured by analyzing the strategies used (i.e., *system management strategies)* and efficiency (i.e., *information sampling).* System management strategies refer to the number of attempts to repair a system fault that is not fixable. Information sampling is the number of times the flow rates were checked each minute.

Results of this study confirmed past research by demonstrating that a task-incompetent superior led to lower dyadic performance and a task-competent superior led to better dyadic performance (Murphy et al., 1995). For this research, task competence of subordinates was also manipulated which extends past studies. We found results on information sampling and on one of the secondary tasks (prospective memory). As expected and supporting past studies (Salas et al., 2008; Salas et al., 2007), the dyads trained on communication skills had higher performance than non-trained dyads. Further, results indicated that an incongruent dyad became more effective when the dyad was trained on communication skills, whereas a

congruent dyad did not benefit from the training. Thus, it seems that CST attenuated the negative effect of the mismatching (i.e., superior who is task-incompetent).

With the CAMS, the mismatch leads to a decrease of dyadic performance on secondary but not on primary tasks. This might be due to the fact that according to Hockey (1993; Robert & Hockey, 1997), secondary tasks are more sensitive than primary tasks. Thus, decreases of dyadic performance in secondary tasks are more likely to occur than primary task decreases. One reason is that one's cognitive resources are invested in primary tasks, in order to maintain high priority task goals within acceptable limits (Robert & Hockey, 1997).

Although this article did not investigate satisfaction, based on previous findings (e.g., Clampitt & Girard, 1986; Lee, 1989) it is likely that the subordinates' satisfaction increases with a superior trained in communication skills. Note that in this study two novel aspects were investigated. CAMS task was used in a superior-subordinate interaction instead of peer interaction, and not only the superior task competence, but also the subordinate task competence was manipulated.

2.4 Summary

After an overview of past research, in this chapter, I presented three articles which examined the impact of superior task and interpersonal (in)competence on the subordinates' perceptions and behaviors, and on leadership effectiveness.

Article 1 focused on superior task competence. We investigated the perceptions and behaviors of subordinates who interact with a task-incompetent superior. Results of the two studies indicated that subordinates perceived a task-incompetent superior as less dominant than a task-competent one, they behaved more dominantly toward the superior and resisted more the superior's influence. The subordinate's perception of the superior's dominance mediated the relationship between the superior task competence and the subordinate's behavioral dominance and resistance.

In Article 2, interpersonal sensitivity was examined. In the first study we wanted to investigate whether individuals expected interpersonal sensitivity as a characteristic of their superior. Results confirmed this expectation. In the second study, we investigated how superior interpersonal sensitivity affected subordinate satisfaction. Results showed a significant positive relationship between superior interpersonal competence and subordinate satisfaction.

The purpose of Article 3 was to integrate task competence and interpersonal competence in one study in order to investigate their impacts on dyadic performance. The distribution of task competence within the dyad was manipulated in order to have a task-competent superior with a task-incompetent subordinate and a task-incompetent superior with a task-competent subordinate. In this article, we gained more information on how superior-subordinate dyads perform according to the task competence of the superior and of the subordinate. Consistent with previous research, superior task competence increased dyadic performance and superior task incompetence decreased dyadic performance. Another aim of this article was to examine the impact of superior-subordinate communication skills training (CST) on dyadic performance. Results revealed that CST increased dyadic performance. The last aim was to investigate the incremental value of CST on dyad task (in)competence for dyadic performance. A dyad led by a task-incompetent superior with a task-competent subordinate became more effective when the dyad was trained on communication, whereas a dyad conducted by a task-competent superior with a task-incompetent subordinate did not benefit from the training.

3 General Discussion

The main goal of my thesis was to ascertain the impact of (mis)match between superior high-dominance position and his or her task competence and/or interpersonal competence on subordinate perceptions, behaviors, and satisfaction, as well as on dyadic performance. In this chapter, I address the main issues driving my thesis, by discussing the strengths and the limitations of the proposed studies. I suggest a revised model of conflict dynamics depending on task competence (Butera et al., 1998), and finally, I discuss future directions.

3.1 Strengths and limitations of my studies

In this section, I discuss the disentangling of task competence and behavioral dominance. I also discuss the distribution of task competence within the dyad. Finally, I emphasize the strengths and limitations of having chosen the superior's gender and laboratory experiments for my thesis.

3.1.1 Disentangling task competence and behavioral dominance

In practice, task competence and behavioral dominance are highly correlated and research has shown that dominant behavior alone can give the impression of competence (Keating, 1985; Tiedens, 2001). Thus, it may be difficult to disentangle them, especially experimentally. In Study 1 of the first article, we manipulated superior task competence, such

that the superior was either an expert or a novice in a problem-solving task – the First Aid Kit Problem. Although this manipulation is often used (e.g., Butera et al., 2005; Fischer-Lokou & Guéguen, 2000), some of the words describing the task incompetence condition could have been viewed as low in dominance. The conditional tense used when the task-incompetent superior said "the mosquito lotion *could be* ranked higher" can be viewed as a low dominance expression, as it entails not stating a preference – a behavior associated with low dominance, as explained in section 1.3.1. For instance, participants who behaved less dominantly than the others told the superior: "I don't really have arguments for this object" and "I'm open to your suggestions". However, it is interesting to note that in Study 2 we did not use suggestions and conditional tense in the superior's script and we still found similar results. Nevertheless, it would also be interesting to observe whether the confederates in superior roles in Study 2 displayed similar levels of behavioral dominance. In this study, we measured the subordinates' perception of superior dominance. This measure can also be used to assess the dominance of the confederates. I did not test it for the publication of Article 1, but I have controlled it for my thesis. Results showed no differences between the 3 confederates regarding their dominance, as perceived by subordinates. From these findings, I can state that the level of perceived dominance is the same across confederates and only the task competence is different. Thus, a difference in task competence (regardless of behavioral dominance) gives the impression of more dominance on the part of a superior which is significant.

3.1.2 Distribution of task competence within the dyad

Little attempt has been made to examine empirically the impact of the distribution of task competence on leadership effectiveness. This was the focus of Article 3. Results showed that when the superior is task-incompetent but the subordinate is task-competent, the dyadic performance decreases. In this article, we only had a task-competent superior with a task-incompetent subordinate and a task-incompetent superior with a task-competent subordinate. It would be interesting to investigate the two other possible combinations (i.e., both superior and subordinate as task-competent or task-incompetent) and ascertain the impact of each distribution of task competence within dyads on leadership effectiveness.

As aforementioned, Snyder and Bruning (1985) showed that when both superior and subordinate are task-competent or task-incompetent, it improves the quality of superior-subordinate exchanges more than when they are dissimilar in task competence levels (one task-competent, the other task-incompetent). However, so far no studies were found concerning the effects of the distribution of task competence within superior-subordinate dyad

on leadership effectiveness. Conversely, as outlined previously, research on the distribution of task competence within the dyad was done on peer interactions (Buchs & Butera, 2009; Butera et al., 2005; Butera, Maggi, et al., 1996; Butera & Mugny, 1995; Mugny et al., 2003). Future experiments manipulating task competence within superior-subordinate dyad should be conducted. This must allow ascertaining the effects of the distribution of task competence within such a dyad on leadership effectiveness or on the dynamics during a superior-subordinate interaction. In section 3.2, I give some lines of thought on this topic. Note that interpersonal competence could also be manipulated within superior-subordinate dyad.

3.1.3 Superior gender

Gender is a widespread research topic. In my thesis the part of the superior was played by a man in two out of the 3 articles (Articles 1 and 3). In Article 1, the superior was always played by a man, whereas subordinates were either women or men. In Article 3, both superiors and subordinates were men. In Article 2 (Study 1), when asking whether an effective superior is interpersonally sensitive, we did not specify whether the superior was a man or a woman. We did not ask participants whether they thought about female or male superior. Research has shown that women are more interpersonally competent than men (J. A. Hall, 1984; McClure, 2000). Further research might focus on whether interpersonal sensitivity is expected at the same level from an effective male or female superior. In Study 2, superiors were either a woman or a man. The correlation between subordinate satisfaction and superior interpersonal sensitivity remained unchanged when controlling for superior gender. Although interpersonal sensitivity is a stereotypically female characteristic (Eagly & Karau, 2002), when men and women have both a high interpersonal sensitivity, gender does not seem to play a role on subordinate satisfaction.

Having mainly chosen men in superior roles reflects the current state of affairs in Switzerland (Bläuer et al., 2009) and also across the world (Eagly & Carli, 2007). Because female superiors as compared to male superiors are judged more negatively and are perceived as less competent (Eagly & Karau, 2002), it is possible that having a female as a competent superior could have introduced unwanted confounds in our manipulation. For instance, research has shown that in mixed-gender teams task-competent men influence others more than task-competent women (Walker, Ilardi, McMahon, & Fennell, 1996). In Article 1, we found that subordinates tended to resist the influence of the male task-incompetent superior. I can assume that subordinates resist the influence of a female task-incompetent superior even more. However, including female superiors would have shown a better overview of the superior's impacts on subordinate perceptions, behaviors, and satisfaction, as well as on

dyadic performance. In addition, it would have allowed us to study the role of gender on these outcomes.

The relation between high-dominance positions and gender was investigated in previous research (Eagly & Johnson, 1990; Eagly & Karau, 1991; Eagly, Karau, & Makhijani, 1995; Eagly, Makhijani, & Klonsky, 1992). However, past research on gender and competence (i.e., general competence in superior role) has primarily focused on subordinate perception of female and male superiors' competence instead of their impact on subordinates. Previous studies showed for instance that gender differences could be problematic in hierarchical interaction. Subordinates have a different perception of male and female superiors and it is common for subordinates to evaluate their female superiors inconsistently (Ragins, 1992). Some research showed that subordinates did not differ in their evaluations of male and female superiors (Petty & Bruning, 1980; Rice, Instone, & Adams, 1984). Other research demonstrated that subordinates rated female superiors higher than their male counterparts (Bartol, 1974; Petty & Miles, 1976) or that subordinates gave higher evaluations to male than female superiors (Bartol & Butterfield, 1976; Haccoun, Haccoun, & Sallay, 1978). Hackman, Hills, Paterson, and Furniss (1993) also studied the differences in subordinates' perceptions of male and female superiors. Overall, male and female superiors were perceived by subordinates as both effective and satisfying to work with. However, female superiors were perceived by subordinates as effective only when displaying masculine characteristics (e.g., assertiveness, independence) and not when displaying feminine characteristics (e.g., gentleness, sensitivity to the needs of others). Moreover, individuals associate task-oriented qualities with men and interpersonally oriented qualities with women (Eagly & Karau, 2002). Thus, task competence is probably more masculine (stereotypically) while interpersonal competence is more feminine. I assume that subordinates will be more satisfied with a more interpersonally competent but less task-competent woman as superior than with a more task-competent woman, but less interpersonally competent. Consequently, future research should include gender in their studies in order to investigate how task competence and interpersonal competence of female superiors impact on subordinates.

3.1.4 Laboratory studies and analyses

The use of laboratory for my thesis' studies offers the opportunity to manipulate experimentally superior competence and to look for its consequences on a causal level. For instance, superior task competence was manipulated in two of the presented articles (Articles 1 and 3). In Article 1, superior role was played by a web-based computer program (adapted from Shechtman, 2002) (Study 1) and by confederates (Study 2). The task-competent superior

used expert terms and referred to the domain-specific knowledge (health and tropical environment). In Article 3, the task-competent superior received a specific training on the CAMS task. The experimental set-ups represented laboratory-based replications of a real established status hierarchy interaction in a standardized setting. For instance, the superior was seated in a comfortable and big chair whereas the subordinate was seated in a simple wooden chair (in Articles 1 and 3). Moreover, the setting provided high internal validity and used innovative tasks able to recreate a work environment such as CAMS or survival problem tasks. However, laboratory studies and having mainly students as participants did not reflect real long-term superior-subordinate relationships integrating all parameters of the interaction (e.g., context, personality, diversity, and other subordinates). Research has shown that expectation toward life and other individuals differs according to birth cohort (Krings, Bangerter, Gomez, & Grob, 2008) and that diversity in a team decreases team performance (Knouse & Dansby, 1999). It is therefore important that laboratory studies are planned in conjunction with fieldwork. Future research should explore how subordinates perceive their superiors and how they behave toward them in a long-term interaction and in daily problem-solving tasks. The impact of superior (in)competence on subordinate perceptions, behaviors, and satisfaction, as well as on dyadic performance might differ from lab results. For instance, the task-competent subordinate might not have the opportunity to resist the superior's influence, because he or she can be reprimanded and punished. The superior might punish more frequently his or her task-competent subordinate when the latter does not follow the superior's instruction.

Laboratory studies allow analyzing behaviors more efficiently compared to live observation in the field. In the lab, behaviors are generally discreetly filmed, so observation is postponed and likely to be inconspicuous. I contributed to increase the body of research on behaviors with this research (Article 1). Different behaviors are expected from a superior compared to a subordinate. On the one hand, people with a high-dominance position are expected to behave more dominantly and indeed behave more dominantly than people with a low-dominance position (J. A. Hall & Friedman, 1999; Johnson, 1994). On the other hand, subordinates have to present themselves humbly and to accept the superior's ideas (Ridgeway & Berger, 1986). Thus, they are expected to behave less dominantly than their superior. However, in Article 1, we found that when the subordinate is paired with a task-incompetent superior, he or she behaves more dominantly. Results were found by coding the dominance in the writing and by observing behavioral dominance. Further research might observe the behavioral dominance of dyads with a task-competent subordinate and task-incompetent

superior and dyads with a task-incompetent subordinate and a task-competent superior as depicted in Article 3. In the same line, observing the behavioral dominance of subordinates facing an interpersonally competent or incompetent superior such as in Study 2 of Article 2 would also be pertinent.

Now that the strengths and limitations of my thesis' research are outlined, in the next section, I will discuss the implications of these findings on the effects of the distribution of task competence within dyads. Thus, I suggest a revised model of conflict dynamics depending on task competence (Butera et al., 1998).

3.2 Revised model of conflict dynamics depending on task competence

Butera and colleagues (Butera et al., 1998) developed a model of conflict dynamics depending on task competence. According to these authors, in a problem-solving task, the task competence of both the source and the target are important for the task resolution. During the problem-solving task, both individuals have an opinion and tend to confront it each other. Depending on the difference in task competence levels within the dyad, various conflict dynamics can be observed. *Conflict dynamics* are processes of doubts, confrontation leading to compliance or not. The model introduces four such dynamics that refer to all task competence distributions within a dyad. Table 2 depicts the dynamics in each condition.

Table 2
Model of conflict dynamics depending on task competence

	Task-competent source	**Task-incompetent source**
Task-competent target	**Conflict of competence** Threat of identity Invalidation of the source	**Lack of conflict** Assured competence Socio-cognitive apathy
Task-incompetent target	**Informational dependence** Imitation Possible transfer and generalization	**Conflict of incompetence** Fear of invalidity Constructivism

Note. This model was adapted from Butera et al. (1998, p. 113) and was translated from French to English for my thesis.

In experiments testing this model, the level of task competence was confounded with the dominance position. For instance, the high task-competent source was depicted as an university professor (Mugny, Quiamzade, Pigière, Dragulescu, & Buchs, 2002) who might be

viewed as being in a high-dominance position, whereas the low task-competent source was depicted as an apprentice (Butera, Mugny, Legrenzi, & Pérez, 1996) who might be viewed as a low-dominance position. The researchers did not manipulate task competence within for instance the high-dominance position (e.g., a task-incompetent professor). In my research, I attempted to disentangle the task competence and the dominance position. The subordinate and the superior had different roles and different levels of task competence. Individuals in high-dominance position were either task-competent or task-incompetent (e.g., the superior was task-competent or task-incompetent). However, one might argue that also in this case the task competence and the dominance position are not completely disentangled, since we did not know whether it was the superior's task incompetence or the interaction between the task incompetence and the high-dominance position of the superior which accounts for some of these findings, for instance, the resistance to influence. Future research should address this issue by combining peer dyads and asymmetric (high vs. low dominance position) dyads. To illustrate, a 2 (source task competence: high vs. low) X 2 (target task competence: high vs. low) X 2 (source dominance position: high vs. neutral) X 2 (target dominance position: low vs. neutral) model should be created. Thus, we can compare a dyad of a task-competent superior and a task-incompetent subordinate with a dyad of a task-competent peer (source) and a task-incompetent peer (target) and see whether they behave or perform differently.

A first step to achieve this complete model would be to examine the model of conflict dynamics depending on task competence by considering the source in a high-dominance position and the target in a low-dominance position and to investigate whether the dynamics are similar to the original model. It allows examining whether it is the source's dominance position or his or her task competence which yields the outcomes presented in Table 2 (e.g., constructivism). Moreover, it could add important contributions in an organizational context. For instance, interpersonal conflict and especially a potential conflict escalation (Glasl, 1982) between the superior and the subordinate might be avoided if we understand the dynamics between a task-(in)competent superior and a task-(in)competent subordinate. Thus, I suggest a revised model of conflict dynamics depending on task competence which would also include superior-subordinate interactions (Table 3). This extension of the model is based on data and findings from Articles 1 and 3, which suggest that dominance position plays an important role in interaction and resolution of problem-solving tasks.

First, Butera et al. (1998) suggested in their model that when the source is task-competent and the target is task-incompetent, the target tends to imitate the source with a possible transfer of knowledge. That is, the target might or might not learn from the exchange.

The target follows the source's decisions or thoughts without challenging them (*informational dependence*). The target's task success depends on the source's knowledge. The analyses of Article 1's data yielded the same conclusion. With the variable "resistance to leader influence", I found that when the superior was task-competent, the subordinate followed the superior's ranking and was less likely to challenge the superior's opinion. Moreover, Price and Garland (1981) demonstrated that task-incompetent subordinates complied significantly more than did participants in all other conditions (e.g., task-competent subordinate vs. task-competent superior). Concerning the transfer of knowledge, in the superior-subordinate interaction, I assume that it is a systematic pattern since the superior embodies a legitimate model to follow and his or her role is to impart his or her knowledge (Carty & Walsh, 2007; Farkas, 2003). The subordinate does not only imitate the superior but learns from him or her. Further support for these findings comes from previous research which has already shown that the more the trainer is in a high-dominance position the more the trainees' performance increases (Justis et al., 1978).

Table 3
Suggested revised model of conflict dynamics depending on task competence

	Task-competent superior	**Task-incompetent superior**
Task-competent subordinate	**Conflict of competence** Acceptation and legitimation High task resolution	**Absence of conflict** *Assured competence* *Socio-cognitive apathy* Subordinate behavioral dominance Invalidation of the superior
Task-incompetent subordinate	**Informational dependence** *Imitation* Systematic transfer	**Conflict of incompetence** *Fear of invalidity* Socio-cognitive apathy Subordinate behavioral dominance Invalidation of the superior

Note. In italics statements similar to the original model

The model suggests furthermore that when both the source and the target are task-incompetent, the target does his or her best to accomplish the problem-solving task without having a higher self-perception of task competence (*conflict of incompetence*). Thus, the target is highly involved in the task (constructivism). To analyze the conflict of incompetence in the superior-subordinate interaction, I use the studies' data of Article 1. In Studies 1 and 2,

we assessed the subordinates' self-perception of task competence and task involvement. Although the subordinate's task (in)competence was not manipulated in this research, we assumed that the subordinate was task-incompetent because the First Aid Kit Problem was a completely new task. Similar results to those from the original model are found for the subordinate's self-perception of task competence. When the superior was task-incompetent, the subordinates did not have a higher self-perception of task competence than those who interacted with a task-competent superior. However, the findings are different for constructivism. Subordinates reported the same level of involvement in the task regardless of the task competence of the superior. I assume that when both superior and subordinate are task-incompetent, the subordinate is not task-involved, because he or she might assume that it is the superior's role to be in charge of the task. Thus, the effect is a socio-cognitive apathy of the task-incompetent subordinate. Moreover, I go a step further from the results of Article 1. In the conflict of incompetence, the subordinate perceives the task-incompetent superior as less dominant, he or she behaves more dominantly toward the superior, and resists the superior's influence. Thus, the subordinate invalidates the superior's decisions or thoughts.

Third, the model indicates that when the source is task-incompetent and the target is task-competent, the target does not follow the source's decisions or thoughts and he or she is less involved and feels competent (*absence of conflict*). In Article 3's study, we compared dyads constituted of task-incompetent superior and task-competent subordinate with dyads constituted of task-competent superior and task-incompetent subordinate. In that study, we measured the subordinates' self-perception of task competence and task involvement. Results showed that task-competent subordinates did not differ in terms of involvement and task competence depending on the level of task competence of the superior. Those results showed only a part of the model and tend not to confirm the statements of the original model (i.e., the subordinate is less involved and feels competent). However, when looking at the processes in a dyad composed of a task-competent subordinate and task-incompetent superior – without comparing to other dyad compositions – the original model still stands. Task-competent subordinates feel task-competent but not task-involved because again they might relinquish responsibility to their superior. Moreover, I go a step further by assuming that when the subordinate is task-competent, the results found in Article 1 are inflated. Thus, the task-competent subordinate perceives the task-incompetent superior as even less dominant, he or she behaves even more dominantly toward the superior, and resists more the superior's influence compared to the task-incompetent subordinate. In this case, again the subordinate invalidates the superior's decisions or thoughts. I assume that when the superior is task-

incompetent (absence of conflict and conflict of incompetence), the subordinate, regardless of his or her task competence, perceives the superior negatively and the task resolution does not progress.

Finally, in their model, Butera et al. (1998) suggested than when both the source and the target are task-competent, the target tends to deny the source's task competence and to invalidate the source's decisions or thoughts. Thus, the task resolution does not progress (*conflict of competence*). The question whether task-competent subordinate invalidates the task-competent superior's suggestions could not have been addressed with the studies' data of Articles 1 and 3. However, I suggest that in the superior-subordinate interaction, it would be different compared to the original model. The task-competent subordinate accepts the superior's task competence which legitimizes the superior's position (Chemers, 2000; French & Raven, 1960; Hollander, 1985). I assume that it is the best constellation to obtain a high task resolution. Moreover, opposite to the original model in which the target's identity is threatened, in the revised model I assume that it is the superior's identity which is threatened. The superior might be afraid to lose the high-dominance position because his or her subordinate is as task-competent as him or her. Future research might investigate the revised model to verify these predictions.

3.3 Future directions

My thesis not only gives answers to some research questions but it evokes as well new questions that will have to be clarified in the future. I suggest that further research is needed to test whether the interpersonal competence of superiors also affects subordinate performance or superior-subordinate performance (dyadic performance), as well as to test the joint effects of superior task and interpersonal competence on subordinate perceptions, behaviors, and satisfaction. In this section I give suggestions on how this line of research could be continued. Moreover, I investigate some of the factors that account for incompetent people obtaining high-dominance positions and I develop ideas on potential research including one of the antecedents of superior incompetence.

3.3.1 Does superior interpersonal competence affect subordinate performance?

In the present research, I have shown that superior competence and leadership effectiveness have many facets. However, it remains unclear whether superior interpersonal competence positively affects subordinate performance. In Article 2, we showed that superior interpersonal competence was related to subordinate satisfaction. Further, meta-analyses showed that satisfaction was linked to performance (e.g., Judge et al., 2001). Thus, we could

assume that superior interpersonal competence is linked to subordinate performance. However, previous research is inconsistent about the relation between superior interpersonal competence and job performance. On the one hand, research on emotional intelligence (close to interpersonal competence; Goleman, 1995) demonstrated a positive impact of superior emotional intelligence on their subordinates in terms of increased levels of performance (Prati et al., 2003; Wong & Law, 2002). On the other hand, Riggio and colleagues' results (2003) provide support that social skills of a superior (similar to interpersonal competence) do not influence subordinates' effectiveness. In order to examine whether superior interpersonal competence is linked to subordinate performance, I propose a survey in which superiors rate subordinate performance and subordinates rate superior interpersonal competence. Although with this method only perception is assessed, it would be a first step to see whether superior interpersonal competence is linked to subordinate performance. To measure superior interpersonal competence, I suggest using the other-report Social Skills Inventory (SSI) scale which is currently being developed by Riggio based on his SSI scale (Riggio, 1986; Riggio & Carney, 2003). To measure subordinate performance, I propose a questionnaire of superior rating suggested in Kaiser et al.'s article (2008).

3.3.2 Do superior task competence and interpersonal competence affect subordinate satisfaction?

As outlined in Chapter 1, past research showed that superiors need different types of competence to succeed. My research adds several important contributions to the existing literature on the extent to which the superior's competence affects subordinates and leadership effectiveness, by disentangling two types of competence, task competence and interpersonal competence. However no empirical research examined the joint effects of superior task and interpersonal competence on leadership effectiveness. The most relevant research integrating task competence and interpersonal competence in a research by Anderson and Kilduff (2009). They concentrated on personality dominance and task and interpersonal competence in peer interactions. In two studies, they investigated how individuals with higher personality dominance achieve influence due to their perceived competence. Through a social relations analysis of peer perceptions (Kenny & LaVoie, 1984), Anderson and Kilduff tested the assumption that team members would perceive individuals with higher personality dominance as more task- and interpersonally competent compared to individuals with lower personality dominance. Results showed that individuals with a higher personality dominance attained influence in part because they were perceived as more task- and interpersonally competent by the other team members. Thus, the team members' perception of task and interpersonal

competence mediates the link between dominance and influence. Moreover, personality dominance led to more competence-signaling behaviors, which in turn led to peers' perceptions of competence. To continue this line of research it would be interesting to focus on superior-subordinate relationships and on the superior's objective task competence and interpersonal competence. A suggestion for such a study is detailed hereunder.

I propose to investigate whether there is a unique and essential type of superior (in)competence, eclipsing the others, which is able to influence subordinate satisfaction by itself. The aim of this research is to show that superiors who are task- and interpersonally competent influence subordinate satisfaction. In order to select or develop an effective leader, these two aspects should not be neglected. As I showed in my thesis and in line with previous findings, superior task and interpersonal competence are important for subordinate satisfaction (Hamblin et al., 1961; Riggio et al., 2003). Given the existing findings, I predict that superior task competence and interpersonal competence are both independent and significant predictors of subordinate satisfaction.

I suggest testing this hypothesis in a laboratory study by manipulating superior task and interpersonal competence. As done in Article 1 (Study 2), a confederate can play the superior and participants will be the subordinates. Superior and subordinate will interact in a survival task which will be videotaped. Superior task competence will be manipulated as in Article 1 (Study 2); the task-competent superior will be expert in the task whereas the task-incompetent one will be novice. Superior interpersonal competence will be manipulated using factors such as involvement in social relations and taking time to listen to others. The superior will be either task- and interpersonally competent, task- and interpersonally incompetent, task-incompetent and interpersonally competent, or task-competent and interpersonally incompetent. After the task, questionnaires on perceived superior task and interpersonal competence, and subordinate satisfaction will be administered. In parallel, individuals can participate in an online survey on managing superior-subordinate relationships in a professional context. Perceived task and interpersonal competence of superiors by subordinates and subordinate satisfaction can be assessed. With this research I propose to show that task competence and interpersonal competence influence independently subordinate satisfaction.

3.3.3 Why do incompetent individuals obtain high-dominance positions?

In order to avoid incompetence in high-dominance positions, it is important to understand why incompetent people obtain high-dominance positions. In this section, I give a

brief explanation and develop ideas on potential research including one of the antecedents of incompetence.

One of the reasons why incompetent individuals obtain high-dominance position might be nepotism. Nepotism refers to hiring or employing incompetent relatives of current employees of an organization (Mhatre, Riggio, & Riggio, in press). When hiring a relative to a high-dominance position, the kinship often plays a more important role than the relative's qualification for the position. As a result, the superior (e.g., son of the CEO) might be incompetent and thus a nepotic superior. By investigating nepotism in high-dominance positions, I assume that the research in the field of superior incompetence can be advanced (Figure 6).

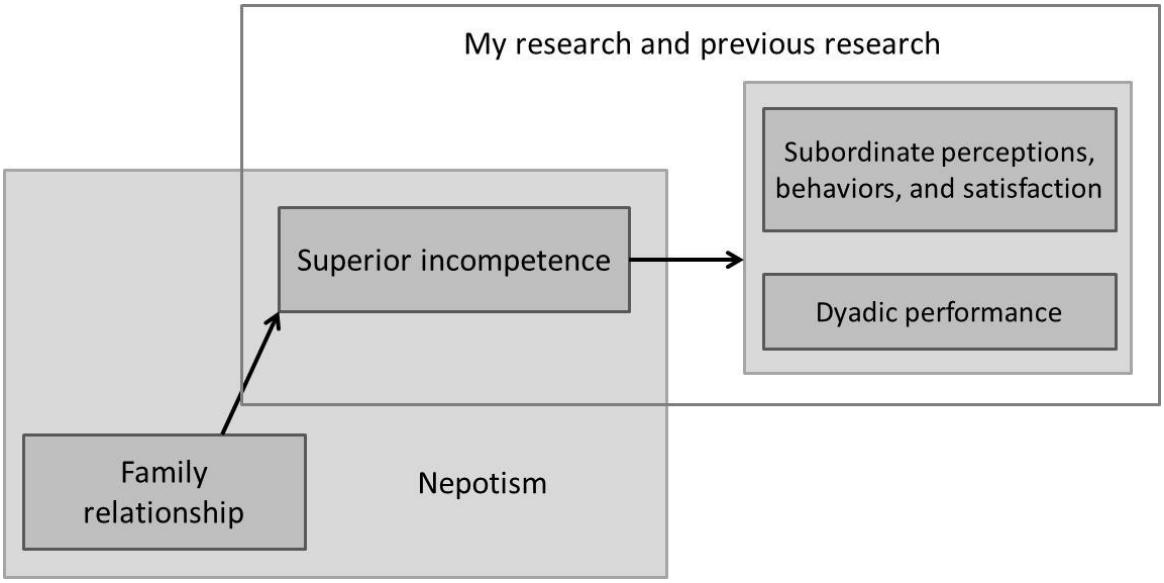


Figure 6. **Schema of a potential antecedent of superior incompetence**
When hiring a new superior, family relationship might play a more important role than the competence. Thus, the superior can be incompetent and this situation leads to different outcomes.

Although hiring relatives is widely practiced around organizations, there is a lack of research that empirically studied hiring relatives while also taking into account incompetence (i.e., nepotism). Similarly, there is little research which studied nepotism in high-dominance position.

Previous research has emphasized that in the work environment, hiring relatives can have certain advantages. It can create a warm family environment which leads to company benefits (Ford & McLaughlin, 1985), and it allows the company to have loyal and involved employees (Lentz & Leband, 1989). However, hiring relatives is undesired and negatively viewed by coworkers, superiors, and subordinates of the hired relative, and often decreases

the morale of those individuals (Ford & McLaughlin, 1985; Slack, 2001). Only few studies examined incompetence as a component of nepotism. For instance, Padgett and Morris (2005) have shown in a laboratory study that during the selection process, participants viewed nepotic candidates (i.e., incompetent relatives of the CEO) less favorably than merited candidates and nepotism was less fair than merit-based hiring. Thus, nepotism violates our basic sense of fairness and might create a precedent which affects the perceived procedural justice of selection.

Empirical research on the impact of nepotism on subordinates is scarce. Arasli and Tumer (2008) conducted a survey on hiring relatives and hiring friends (favoritism) in the banking industry. They found that these two practices led to job stress and decreased subordinate satisfaction, with hiring relatives having the most negative impact on job stress. As a consequence, many talented individuals may quit their jobs because hiring or employing relatives obstructs their career advancement. Furthermore, subordinates felt they were occupying a highly unattractive position when their superior was a relative of executives who is clearly incompetent (Kets de Vries, 1993).

More research is needed to gain a better understanding on how acts of nepotism affect subordinate perceptions, behaviors, and satisfaction, as well as dyadic performance. It would be interesting to know how subordinates perceive the hire of a relative and whether this is always perceived as nepotism or only in the case of incompetence. Questions can be asked on what happens when the superior, though task- and interpersonally competent, is a relative of the CEO of the company. Would he or she still be perceived as effective and lead to high team performance and subordinate satisfaction, as suggested by my thesis?

In order to answer these questions, I suggest investigating relationship between subordinate and nepotic superior. Nepotic superior refers to a task- and interpersonally incompetent relative of executives in a high-dominance position. Thus, two dimensions must be included in this research – familial relationship (with vs. without) and competence (task and interpersonal: competence vs. incompetence).

In a laboratory study, I propose to examine whether nepotism affects subordinates' perceptions of their superior and the situation, job satisfaction, and behaviors, as well as dyadic performance in a problem-solving task. I expect that subordinates perceive individuals who have been appointed to the high-dominance position because of the family ties as less competent than those who have no family ties, regardless of their competence. Also, I propose that incompetence affects satisfaction and dyadic performance to a lesser degree when the

superior is not a relative of executives compared to when the superior is one. Moreover, on the basis of the results of Article 1, I hypothesize that subordinates interacting with incompetent individuals who have been appointed to the high-dominant position because of the family ties behave more dominantly than when being together with a competent superior.

To investigate the influence of perceived nepotism on the subordinates' perceptions, behaviors, and satisfaction, as well as on dyadic performance, I suggest that participants take part in a dyadic interaction which entails the completion of a survival problem task. The superior can be played by a confederate. The family relationship of the confederate can be manipulated by introducing him or her to the participant as the cousin of the experimenter or a person who is not a relative of the experimenter. In order to manipulate interpersonal competence, I propose to train the confederate on factors such as involvement in interpersonal relations and taking time to listen to others. In order to manipulate task competence, I propose a trained confederate who uses specific terms according to the task competence's conditions as used in Article 1. After the task, questionnaires on perceived superior task and interpersonal competence and subordinate satisfaction could be administered and dyadic performance evaluated. Moreover, I suggest to code subordinate behavioral dominance. This research would shed light on how perceived nepotism affects the subordinates' perceptions, behaviors, and satisfaction, as well as the dyadic performance.

4 Significance and Implications for Work Psychology

With my thesis, I provide further information concerning the mechanism that underlies the superior-subordinate relationship. Knowing better how subordinates perceive, behave toward task- or interpersonally competent or incompetent superior, and how the superior's competence or incompetence affects the subordinates' outcomes is relevant and important for application in a work and organizational context. In this chapter, I discuss the significance and the main practical implications stemming from the results found and I develop some advice for subordinates and practitioners in such situations.

The subordinate is the main target of my thesis' research. His or her behaviors and perceptions have been examined through decision-making situations with a superior. In these situations the subordinate can contribute his or her knowledge and opinions and the superior is the final decision-maker (Guzzo & Dickson, 1996). This context is appropriate because it allows a complete focus on subordinate responses to superior behaviors. Studying the subordinates' responses on the superior's task incompetence (Article 1) is of great importance. First, it questions the strict obedience of subordinates toward people in high-

dominance positions. Second, it demonstrates that contrary to prototypical ideas, the superior's task incompetence does not only have disadvantages for subordinates or for the organization, but also advantages.

Social psychologists have demonstrated (Hofling, Brotzman, Dalrymple, Graves, & Pierce, 1966; Milgram, 1965) that when the superior-subordinate relationship is legitimate (i.e., the superior is the most task-competent), subordinates might be too obedient vis-à-vis their superior and this situation sometimes creates serious consequences. There are real-life examples illustrating the effects of a legitimate superior on a subordinate's behavior or lack of reactions. For instance, in 2001 a US submarine collided with another vessel while surfacing. The commander (the superior) reported that everything was clear for surfacing, whereas the technician (the subordinate) saw on his radar another ship but never reported it. He was afraid to contradict the commander's point of view. Thus, the findings of Article 1 have shown that when the superior is task-incompetent, the subordinate gains self-confidence, resists the superior's influence more, and dares to challenge the high-dominance position. In other words, when the situation is illegitimate, the strict obedience of subordinates toward high-dominance position declines. Innovative ideas or better solutions might emerge during the superior-subordinate problem-solving process. Incidents such as the US submarine might be thereby avoided. Further support for these findings comes from previous research which has already shown that the superior's task incompetence might create cohesion and initiative taking within subordinates (Hamblin et al., 1961). Subordinates might feel that they can contribute to the task and the decision-making process.

Incidents similar to the US submarine are mainly due to communicational problems between the superior and the subordinate. Communicational problems within dyad are avoidable with communication skills training (CST). The results of Article 3 have highlighted the fact that when the superior is task-incompetent but the subordinate is task-competent, the performance is better when the dyad learns how to communicate. To avoid mistakes and wrong decisions due to superior incompetence, the superior should learn how to listen to the subordinate and the subordinate should learn how to influence the superior. Inexorably, there are circumstances in practice in which a superior is less task-competent than his or her subordinates. Consequently, CST is important for every work group and is necessary to be developed in organization and departments working in dyads or teams. The findings of Article 3 suggest improvement strategies for dyads by showing that task incompetence can be alleviated with CST within dyad.

Although CST or global training in interpersonal competence is included in the formation programs of many organizations, each case must be studied beforehand. For instance, increased superior sensitivity may be counterproductive on the job. For instance, an interpersonally sensitive superior will be unable to cope with strong opposition from his or her subordinates. The superior will waste time to listen to the subordinates and to try to find a suitable alternative satisfying all subordinates, while there is a unique possible decision. Moreover, having figured out that interpersonal sensitivity is expected from an effective superior (Article 2, Study 1) is important. Due to increased geographical mobility of workers, it is important to ascertain what employees are expecting from an effective superior. Modern employees are uncommitted to look for another position when they are dissatisfied with their superior, at least within certain limits. Thus, it is relevant to investigate superior interpersonal sensitivity and the subordinates' expectations during the selection process in order to avoid dissatisfied subordinates.

Nowadays, researchers investigate more toxic leadership or abusive supervision (e.g., Lipman-Blumen, 2005; Tepper, 2000; Tepper et al., 2001; Tepper et al., 2008) than superior incompetence. Moreover, practitioners have developed more team leading training techniques than task training techniques. The superior's task competence has been neglected. Thus, my thesis brought back the focus of attention on the superior's task competence. I showed that superior task competence has a strong impact on subordinates; this in turn might also have a strong impact on the organization. It is relevant to make the practitioners aware of the necessity of a task competence training in order to have an effective superior. The Human Resource departments should set up and suggest internal trainings to each superior. These practices offer the opportunity to increase superiors' task competence across seminar, workshops, practical training, and so on. To revisit the example used in the introduction, an international organization has its headquarters in England and employs Paul as the financial director of the French office. Paul is unable to speak English correctly and does not know the new financial software. Thus, his organization should help Paul by offering him English courses and training on the financial software. Thus, Paul would be able to communicate with the headquarters and also to adapt his instructions to an efficient use of the new software.

Based on the findings of my thesis, some practical advice can be given. For instance, the key for subordinates with an incompetent superior is to communicate with their superior. I can suggest one method generally used to cope with interpersonal conflict, the DESC method (Bower & Bower, 1991). A lack of superior competence can be a potential source of interpersonal conflict between the superior and the subordinate. The DESC method consists of

four steps, which consist of describing the behavior (D), explaining the effect of the behavior (E), and stating the desired outcome (S), of finally highlighting the consequence of the desired outcome or the consequence if the behavior continues (C). To illustrate, Paul is perceived as incompetent because he has, among others, lack of English skills. In order to change the situation, one of his subordinates should have a face-to-face conversation with him following the four-step DESC techniques. Table 4 illustrates it.

Table 4
Illustration of the four-step DESC method

D-	Describe the behavior	During meetings with the headquarters, you are unable to communicate properly with them because you are not fluent in English.
E-	Explain the effect	I feel embarrassed and stressed because they misunderstood your points and our work. They blame the team whereas the tasks are correctly executed but poorly communicated.
S-	State the desired outcome	Therefore, I would like to suggest English lessons.
C-	Consequence	So that you improve your skills and you will be more self-confident and better explain the team's outcomes.

In case this method is unsuccessful subordinates might find another solution such as talking to the superior's superior, especially if the incompetence affects the team or the organizational performance. In reality, it is very often the case that the ultimate solution is to quit the job if the situation becomes too nerve racking.

Practitioners who want to avoid incompetent superiors or want to develop superior competence should stress the importance of feedback and promotion processes besides training programs. Superior incompetence is common because high-dominance positions often prevent subordinate or peer feedback. Superiors do not obtain regular performance evaluations and they might use their position to intimidate their subordinates or colleagues (Burke, 2006). However, the peer and subordinate feedback is crucial. Thus, the 360-degree feedback (i.e., individual feedback provided by subordinates, peers, and superior) should be integrated in organizations. Individuals in high-dominance positions should receive feedback from their subordinates, colleagues, and superior. Research has shown that the 360-degree

feedback is effective at improving performance, especially when individuals share their development plans with their colleagues and ask for suggestions (Smither et al., 2004). Moreover, when individuals are promoted to a high-dominance position, they must be prepared and accompanied to assume this new role. Research has suggested that individuals in high-dominance positions need at least three months to learn their new role and tasks (Watkins, 2003). Downey, March, and Berkman (2001) have assumed that even more time is needed to gain the self-confidence that occurs with competence in the new role.

To sum up, the studies of my thesis lead to a better understanding on how subordinates perceive, behave toward task- or interpersonally competent or incompetent superior and how the competence or incompetence affects subordinates. The superior's incompetence is a rather out-of-bounds topic. However, subordinates mention and discuss it often. The superior's incompetence is not always detrimental for subordinates and can be compensated by specific superior-subordinate interpersonal competence and task competence trainings and an appropriate communication. Thus, the present thesis might be used to initiate subordinates, superiors, and practitioners about how to cope with the incompetence and to improve the relation between superior and subordinate.

****

References

Adamchik, W. (2006, June 19). Technical competence vs technical expertise. Retrieved from http://EzineArticles.com

Aidar, J. (1989). *Great leaders*. Guilford, UK: Talbot Press.

Anderson, C., & Kilduff, G. J. (2009). Why do dominant personalities attain influence in face-to-face groups? The competence-signaling effects of trait dominance. *Journal of Personality & Social Psychology, 96*(2), 491-503.

Antonakis, J., Cianciolo, A. T., & Sternberg, R. J. (2004). *The nature of leadership*. Thousand Oaks, CA: Sage Publications.

Arasli, H., & Tumer, M. (2008). Nepotism, favoritism, and cronyism: A study of their effects on job stress and job satisfaction in the banking industry of North Cyprus. *Social Behavior & Personality: An International Journal, 36*(9), 1237-1250. doi: 10.2224/sbp.2008.36.9.1237

Argyle, M. (1989). Do happy workers work harder? The effect of job satisfaction on work performance. In R. Veenhoven (Ed.), *How harmful is happiness? Consequences of enjoying life or not*. Rotterdam University, The Netherlands.

Ashforth, B. (1997). Petty tyranny in organizations: A preliminary examination of antecedents and consequences. *Canadian Journal of Administrative Sciences, 14*(2), 126-140.

Avolio, B. J. (1999). *Full leadership development: Building the vital forces in organizations*. Thousand Oaks, CA: Sage.

Baker, D., Prince, C., Shrestha, L., Oser, R., & Salas, E. (1993). Aviation computer games for crew resource management training. *The International Journal of Aviation Psychology, 3*(2), 143-156.

Bartol, K. M. (1974). Male versus female leaders: The effect of leader need for dominance on follower satisfaction. *The Academy of Management Journal, 17*(2), 225-233.

Bartol, K. M., & Butterfield, D. A. (1976). Sex effects in evaluating leaders. *Journal of Applied Psychology, 61*(4), 446-454.

Bass, B. M. (1985). *Leadership and performance beyond expectations*. New York: Free Press.

Bass, B. M., & Bass, R. B. (2008). *The Bass handbook of leadership: Theory, research, and managerial applications* (4th ed.). New York: The Free Press.

Berger, J., Conner, T. L., & Fisek, H. (1974). *Expectation States Theory: A theoretical research program*. New York: Elsevier.

Berger, J., Webster, M., Ridgeway, C., & Rosenholtz, S. J. (1986). Status cues, expectations, and behavior. In E. J. Lawler (Ed.), *Advances in Group Processes* (Vol. 3). Greenwich, CT: JAI Press.

Blagg, D., & Young, S. (2001). What makes a good leader? *Harvard Business School Bulletin, February*, 31-36.

Bläuer, A., Laessig, V., Moser, S., & Vuille, A. (2009). ESPA 2009 en bref. Principaux résultats de l'enquête suisse sur la population active. Neuchâtel: Office fédéral de la statistique (OFS).

Bottger, P. C. (1984). Expertise and air time as bases of actual and perceived influence in problem-solving groups. *Journal of Applied Psychology, 69*(2), 214-221.

Bottger, P. C., & Yetton, P. W. (1988). An integration of process and decision scheme explanations of group problem solving performance. *Organizational Behavior and Human Decision Processes, 42*(2), 234-249. doi: 10.1016/0749-5978(88)90014-3

Bower, S. A., & Bower, G. H. (1991). *Asserting yourself: A practical guide for positive change* (2nd ed.). Reading, MA: Addison Wesley Longman.

Boyatzis, R. E. (1982). *The competent manager*. New York: John Wiley.

Brown, J. B., Boles, M., Mullooly, J. P., & Levinson, W. (1999). Effect of clinician communication skills training on patient satisfaction: A randomized, controlled trial. *Annals of Internal Medecine, 131*(11), 822-829.

Bruce, S. (2010, May 28). Don't let incompetent bosses stand in your way, *HR Daily Advisor: Practical Human Resource Typs, News & Advice*. Retrieved from http://hrdailyadvisor.blr.com/archive/2010/05/28/Epinions_Managing_Incompetent_Boss.aspx

Buchs, C., & Butera, F. (2009). Is a partner' s competence threatening during dyadic cooperative work? It depends on resource interdependence. *European Journal of Psychology of Education, 24*(2), 145-154.

Burke, R. J. (2006). Why leaders fail: Exploring the darkside. *International Journal of Manpower, 27*(1), 91-100.

Burns, J. M. (1978). *Leadership*. New York: Harper & Row.

Butera, F., Caverni, J.-P., & Rossi, S. (2005). Interaction with a high- versus low-competence influence source in inductive reasoning. *Journal of Social Psychology, 145*(2), 173-190.

Butera, F., Gardair, E., Maggi, J., & Mugny, G. (1998). Les paradoxes de l'expertise: Influence sociale et (in)compétence de soi et d'autrui. In J. Py, A. Somat, & J. Baillé

(Eds.), *Psychologie sociale et formation professionnelle: Propositions et regards critiques* (pp. 109-123). Rennes: Presses Universitaires de Rennes.

Butera, F., Maggi, J., Mugny, G., Pérez, J. A., & Roux, P. (1996). Incertitude et conflit d'incompétences: Influences sociales dans les tâches objectives ambigües. In J.-L. Beauvois, V. Joule, & J.-M. Monteil (Eds.), *Perspectives cognitives et conduites sociales* (pp. 89-106). Neuchâtel: Delachaux & Niestlé.

Butera, F., & Mugny, G. (1995). Conflict between incompetences and influence of a low-expertise source in hypothesis testing. *European Journal of Social Psychology, 25*(4), 457-462.

Butera, F., Mugny, G., Legrenzi, P., & Pérez, J. A. (1996). Majority and minority influence, task representation, and inductive reasoning. *British Journal of Social Psychology, 35*(1), 123-136.

Carter, L., & Nixon, M. (1949). Ability, perceptual, personality, and interest factors associated with different criteria of leadership. *Journal of Psychology, 27*, 377-388.

Carty, R., & Walsh, S. (2007). The role of middle managers in knowledge transfer. *Journal of Information & Knowledge Management, 6*(4), 297-302.

Cashman, J., Dansereau, F. J., Graen, G., & Haga, W. J. (1976). Organizational understructure and leadership: A longitudinal investigation of the managerial role-making process. *Organizational Behavior and Human Performance, 15*, 278-296.

Chemers, M. M. (2000). Leadership research and theory: A functional integration. *Group Dynamics: Theory, Research, & Practice, 4*(1), 27-43.

Churchill, G. A., Ford, N. M., & Walker, O. C. (1974). Measuring the job satisfaction of industrial salesmen. *Journal of Marketing Research, 11*(3), 254-260. doi: 10.2307/3151140

Clampitt, P. G., & Downs, C. W. (1993). Employee perceptions of the relationship between communication and productivity: A field study. *The Journal of Business Communication, 30*(1), 5-28.

Clampitt, P. G., & Girard, D. (1986). *Communication satisfaction: A useful construct?* Paper presented at the the International Communication Association, Chicago, IL.

Cohen, B. P., & Lee, H. (1975). *Conflict, conformity, and social status*. New York: Elsevier.

Cooper, G., White, M., & Lauber, J. (1980). *Resource management on the flightdeck.* Paper presented at the NASA/Industry Workshop, NASA-Ames Research Center, Moffatt Field, CA.

Dansereau, E., Graen, G., & Haga, W. J. (1975). A vertical dyad linkage approach to leadership within formal organizations: A longitudinal investigation of the role making process. *Organizational Behavior and Human Performance, 13*(1), 46-78.

Darioly, A., & Schmid Mast, M. (2011a). Facing an incompetent leader: The effects of a non-expert leader on subordinates' perception and behavior. *European Journal of Work and Organizational Psychology, 20*(2), 239–265. doi: 10.1080/13594320903429576

Darioly, A., & Schmid Mast, M. (2011b). *Leader incompetence: Its impact on subordinate satisfaction*. Manuscript in preparation.

de Reuver, R. (2006). The influence of organizational power on conflict dynamics. *Personnel Review, 35*(5), 589-603.

Devine, D. J., & Philips, J. L. (2001). Do smarter teams do better: A meta-analysis of cognitive ability and team performance. *Small Group Research, 32*(5), 507-533.

DfEE. (1999). *Skill Shortages. An Initial Survey of Evidence*. (SEN 347). London, UK.

DfEE, & Cabinet Office. (1996). *The skills audit: A report from an interdepartmental group*. London, UK: DfEE and Cabinet Office.

Dickson, D., Hargie, O., & Morrow, N. (Eds.). (1997). *Communication skills training for health professionals* (2nd ed.). London, UK: Chapman and Hall.

Dionne, S. D., Yammarino, F. J., Atwater, L. E., & Spangler, W. D. (2004). Transformational leadership and team performance. *Journal of Organizational Change Management, 17*(2), 177-193. doi: 10.1108/09534810410530601

Downey, D., March, T., & Berkman, A. (2001). *Assimilating new leaders*. New York: AMACOM.

Droog, A. (2004). The current status of CRM training and its regulations in Europe. In K. M. Goeters (Ed.), *Aviation psychology: Practice and research* (pp. 221-230). Aldershot, UK: Ashgate Publishing Limited.

Duchon, D., Green, S. G., & Taber, T. D. (1986). Vertical dyad linkage: A longitudinal assessment of antecedents, measures, and consequences. *Journal of Applied Psychology, 71*(1), 56-60.

Eagly, A. H., & Carli, L. L. (2007). Women and the labyrinth of leadership. *Harvard Business Review, 85*(9), 62-71.

Eagly, A. H., & Johnson, B. T. (1990). Gender and leadership style : A meta-analysis. *Psychological Bulletin, 108*(2), 233-259.

Eagly, A. H., & Karau, S. J. (1991). Gender and the emergence of leaders: A meta-analysis. *Journal of Personality and Social Psychology, 60*(5), 685-710.

Eagly, A. H., & Karau, S. J. (2002). Role congruity theory of prejudice toward female leaders. *Psychological Review, 109*(3), 573-598.

Eagly, A. H., Karau, S. J., & Makhijani, M. G. (1995). Gender and the effectiveness of leaders: A meta-analysis. *Psychological Bulletin, 117*(1), 125-145.

Eagly, A. H., Makhijani, M. G., & Klonsky, B. G. (1992). Gender and the evaluation of leaders: A meta-analysis. *Psychological Bulletin, 111*(1), 3-22.

Ellyson, S. L., & Dovidio, J. F. (1985). Power, dominance, and nonverbal behavior: Basic concepts and issues. In S. L. Ellyson & J. F. Dovidio (Eds.), *Power, dominance, and nonverbal behavior* (pp. 1-27). New York: Springer.

English, A., Griffith, R., L., & Steelman, L. A. (2004). Team performance: The effect of team conscientiousness and task type. *Small Group Research, 35*(6), 643-665. doi: 10.1177/1046496404266320

Evans, D. R. (2010). Communication Skills Training. *The Corsini Encyclopedia of Psychology* (pp. 1-2). Hoboken, NJ: John Wiley & Sons, Inc.

Exline, R. V., & Messick, D. M. (1967). The effects of dependency and social reinforcement upon visual behavior during an interview. *British Journal of Social and Clinical Psychology, 6*, 256-266.

Faragher, E. B., Cass, M., & Cooper, C. L. (2005). The relationship between job satisfaction and health: A meta-analysis. *Occupational and Environmental Medicine, 62*, 105-112. doi: 10.1136/oem.2002.006734

Farkas, F. (2003). The role of leadership in knowledge management and knowledge transfer. In I. Lengyel (Ed.), *Knowledge transfer, small and medium- sized enterprises, and regional developments in Hungary* (pp. 1-14). Szeged, Hungary: JATE Press.

Ferguson, A. J., Ormiston, M. E., & Moon, H. (2010). From approach to inhibition: The influence of power on responses to poor performers. *Journal of Applied Psychology, 95*(2), 305-320.

Fischer-Lokou, J., & Guéguen, N. (2000). Processus de persuasion en situation de médiation: Effets du pouvoir d'expertise et d'innovation. *Canadian Psychology, 41*(4), 267-278.

Fleishman, E. A. (1953). The description of supervisory behavior. *Personnel Psychology, 37*, 1-6.

Fletcher, G. C. L., McGeorge, P., Flin, R., Glavin, R. J., & Maran, N. (2002). The role of non-technical skills in anaesthesia: A review of current literature. *British Journal of Anaesthesia, 88*(3), 418-429.

Flin, R., & Maran, N. (2004). Identifying and training non-technical skills for teams in acute medicine. *Quality and Safety in Health Care, 13*(suppl 1), 80-84. doi: 10.1136/qshc.2004.009993

Flin, R., & O'Connor, P. (2001). Applying crew resource management on offshore oil platforms. In E. Salas, C. A. Bowers, & E. Edens (Eds.), *Improving teamwork in organizations. Applications of resource management training*. Mahwah, NJ: LEA.

Flin, R., O'Connor, P., & Mearns, K. (2003). Crew resource management: Improving team work in high reliability industries. *Team Performance Management, 8*(3/4), 68-78.

Ford, R., & McLaughlin, F. (1985). Nepotism. *Personnel Journal, 64*(9), 57-61.

Fragale, A. R. (2006). The power of powerless speech: The effects of speech style and task interdependence on status conferral. *Organizational Behavior and Human Decision Processes, 101,* 243-261. doi: 10.1016/j.obhdp.2006.01.004

French, J. P. R., & Raven, B. (1960). The bases of social power. In D. Cartwright & A. Zander (Eds.), *Group dynamics* (pp. 607-623). New York: Harper and Row.

Fromme, D., & Beam, D. (1974). Dominance and sex differences in non-verbal responses to differential eye contact. *Journal of Research in Personality, 8*(1), 76-87. doi: 10.1016/0092-6566(74)90047-6

Gardner, H. (1983). *Frames of Mind: The theory of multiple intelligences*. New York: Basic Books.

Gerstner, C. R., & Day, D. V. (1997). Meta-analytic review of leader-member exchange theory: Correlates and construct issues. *Journal of Applied Psychology, 82*(6), 827-844.

Gioia, D. A., Donnellon, A., & Sims, H. P., Jr. (1989). Communication and cognition in appraisal: A tale of two paradigms. *Organization Studies, 10*(4), 503-530.

Glasl, F. (1982). The process of conflict escalation and roles of third parties. In G. B. J. Bomers & R. B. Peterson (Eds.), *Conflict management and industrial relations* (pp. 119-140). The Hague, The Netherlands: Kluwer Nijhoff Publishing.

Goleman, D. (1995). *Emotional intelligence*. New York: Bantam Books.

Golub, S., & Maxwell Canty, E. (1982). Sex-role expectations and the assumption of leadership by college women. *The Journal of Social Psychology, 116*(1), 83-90.

Gough, H. G. (1984). A managerial potential scale for the California Psychological Inventory. *Journal of Applied Psychology, 69*(2), 233-240.

Graen, G. B., & Cashman, J. (1975). A role-making model of leadership in formal organizations: A development approach. In J. G. Hunt & L. L. Larson (Eds.), *Leadership frontiers* (pp. 143-165). Kent, OH: Kent State University.

Graen, G. B., Novak, J. A., & Sommerkamp, P. (1982). The effects of leader-member exchange and job design on productivity and satisfaction: Testing a dual attachment model. *Organizational Behavior and Human Performance, 30*(1), 109-131.

Grant, K. P., Baumgardner, C. R., & Shane, G. S. (1997). The perceived importance of technical competence to project managers in the defense acquisition community. *Engineering Management, IEEE Transactions on, 44*(1), 12-19.

Guzzo, R. A., & Dickson, M. W. (1996). Teams in organizations: Recent research on performance and effectiveness. *Annual Review of Psychology, 47*(1), 307-338.

Haccoun, D. M., Haccoun, R. R., & Sallay, G. (1978). Sex differences in the appropriateness of supervisory styles: A nonmanagement view. *Journal of Applied Psychology, 63*(1), 124-127.

Hackman, J. R. (1989). *Groups that work (and those that don't)*. San Francisco, CA: Jossey-Bass.

Hackman, J. R., Hills, M. J., Paterson, T. J., & Furniss, A. H. (1993). Leaders' gender-role as a correlate of subordinates' perceptions of effectiveness and satisfaction. *Perceptual and Motor Skills, 77*(2), 671-674.

Hall, J. (1978). *NASA moon survival task*. Bromley, UK: Teleometrics.

Hall, J. A. (1984). *Nonverbal sex differences: Communication accuracy and expressive style*. Baltimore, MA: Johns Hopkins University Press.

Hall, J. A., & Bernieri, F. J. (2001). *Interpersonal sensitivity: Theory and measurement*. Mahwah, NJ: Erlbaum.

Hall, J. A., Coats, E. J., & Smith LeBeau, L. (2005). Nonverbal behavior and the vertical dimension of social relations: A meta-analysis. *Psychological Bulletin, 131*(6), 898-924. doi: 10.1037/0033-2909.131.6.898

Hall, J. A., & Friedman, G. B. (1999). Status, gender, and nonverbal behavior: A study of structured interactions between employees of a company. *Personality and Social Psychology Bulletin, 25*, 1082-1091. doi: 10.1177/ 01461672992512002

Hall, J. A., Rosip, J. C., Smith LeBeau, L., Horgan, T. G., & Carter, J. D. (2006). Attributing the sources of accuracy in unequal-power dyadic communication: Who is better and why? . *Journal of Experimental Social Psychology, 42*(1), 18-27.

Hamblin, R. L., Miller, K., & Wiggins, J. A. (1961). Group morale and competence of the leader. *Sociometry, 24*(3), 295-311.

Hargie, O. (Ed.). (2006). *The handbook of communication skills*. East Sussex, UK: Routledge.

Hargie, O., Dickson, D., Boohan, M., & Hughes, K. (1998). A survey of communication skills training in UK Schools of Medicine: Present practices and prospective proposals. *Medical Education, 32*(1), 25-34. doi: 10.1046/j.1365-2923.1998.00154.x

Harter, J. K., Schmidt, F. L., & Hayes, T. L. (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis. *Journal of Applied Psychology, 87*(2), 268-279.

Helmreich, R. L., Merritt, A., & Wilhelm, J. A. (1999). The evoluation of crew resource management training in commercial aviation. *International Journal of Aviation Psychology, 9*(1), 19-32.

Hockey, G. R. J. (1993). Cognitive-energetical mechanisms in the management of work demands and psychological health. In A. D. Baddeley & L. Weiskrantz (Eds.), *Attention, selection, awareness, and control: A tribute to Donald Broadbent* (pp. 328-345). Oxford, UK: Oxford University Press.

Hockey, G. R. J., Wastell, D., & Sauer, J. (1998). Effects of sleep deprivation and user interface on complex performance: A multilevel analysis of compensatory control. *Human Factors, 40*(2), 233-253.

Hofling, C. K., Brotzman, E., Dalrymple, S., Graves, N., & Pierce, C. M. (1966). An experimental study of nurse-physician relationships. *Journal of Nervous and Mental Disease, 143*, 171-180.

Hogan, R. (2007). *Personality and the fate of organization*. Hillsdale, NJ: Erlbaum.

Hogan, R. (2009). The development of the Hogan Competency Model. Retrieved from http://www.hoganassessments.com/sites/default/files/Competency%20Model%20White%20Up_FinalREV.pdf.

Hogan, R., Curphy, G. J., & Hogan, J. (1994). What we know about leadership: Effectiveness and personality. *American Psychologist, 49*(6), 493-504.

Hogan, R., & Hogan, J. (1995). *Hogan Personality Inventory Manual*. Tulsa, OK: Hogan Assessment Systems.

Hogan, R., & Hogan, J. (2001). Assessing leadership: A view from the dark side. *International Journal of Selection and Assessment, 9*(1/2), 40-51.

Hogan, R., & Kaiser, R., B. (2005). What we know about leadership. *Review of General Psychology, 9*(2), 169-180.

Hogan, R., & Warrenfeltz, R. (2003). Educating the modern manager. *Academy of Management Learning & Education, 2*(1), 74-84.

Hollander, E. P. (1978). *Leadership dynamics: A practical guide to effective relationships*. New York: Free Press.

Hollander, E. P. (1985). Leadership and power. In G. Lindzey & E. Aronson (Eds.), *The handbook of social psychology* (pp. 485-537). New York: Random House.

Huguet, P., Dumas, F., Monteil, J. M., & Genestoux, N. (2001). Social comparison choices in the classroom: Further evidence for students' upward comparison tendency and its beneficial impact on performance. *European Journal of Social Psychology, 31*(5), 557-578. doi: 10.1002/ejsp.81

Huguet, P., Galvaing, M. P., Monteil, J. M., & Charbonnier, E. (1999). Présence d'autrui et performance individuelle: Repères et éléments de réflexion. *Connexions, 72*, 185-198.

Ickes, W. J. (Ed.). (1997). *Empathic accuracy*. New York: Guilford Press.

Ickes, W. J. (2001). Measuring empathic accuracy. In J. A. Hall & F. Bernieri (Eds.), *Interpersonal sensitivity: Theory and measurement* (pp. 219-241). Mahwah, NJ: Erlbaum.

Ickes, W. J. (2003). *Everyday mind reading: Understanding what other people think and feel*. Amherst, NY: Prometheus Books.

Jablin, F. M. (1978). Message-reponse and "openess" in superior-subordinate communication. In B. D. Ruben (Ed.), *Communication yearbook II*. New Brunswick, NJ: Transaction Books.

Jablin, F. M. (1979). Superior-subordinate communication: The state of the art. *Psychological Bulletin, 86*(6), 1201-1222. doi: http://dx.doi.org/10.1037/0033-2909.86.6.1201

Jablin, F. M. (1985). Task/work relationships: A life-span perspective. In M. L. Knapp & G. R. Miller (Eds.), *Handbook of interpersonal communication* (pp. 615-654). Newbury Park, CA: Sage.

Jackson, D. N. (Ed.). (1984). *Manual for the Personality Research Form* (3rd ed.). Goshen, NY: Research Psychologists Press.

Jain, H. C. (1973). Supervisory communication and performance in urban hospitals. *Journal of Communication, 23*(1), 103-117. doi: 10.1111/j.1460-2466.1973.tb00935.x

Jenkins, K. M. (1977). *A study of the relationship between organizational communication and worker performance.* Unpublished doctoral dissertation, Arizona State University.

Johnson, C. (1994). Gender, legitimate authority, and leader-subordinate conversations. *American Sociological Review, 59*(1), 122-135.

Judge, T. A., Piccolo, R. F., & Ilies, R. (2004). The forgotten ones? The validity of consideration and initiating structure in leadership research. *Journal of Applied Psychology, 89*(1), 36-51.

Judge, T. A., Thoresen, C. J., Bono, J. E., & Patton, G. K. (2001). The job satisfaction-job performance relationship: A qualitative and quantitative review. *Psychological Bulletin, 127*(3), 376-407.

Justis, R. T. (1975). Leadership effectiveness: A contingency approach. *The Academy of Management Journal, 18*(1), 160-167.

Justis, R. T., Kedia, B. L., & Stephens, D. B. (1978). The effect of position on power and perceived task competence on trainer effectiveness: A partial utilization of Fielder's contingency model of leadership. *Personnel Psychology, 31*(1), 83-93.

Kaiser, R. B., Hogan, R., & Craig, S. B. (2008). Leadership and the fate of organizations. *American Psychologist, 63*(2), 96-110.

Kanki, B. G., Helmreich, R. L., & Anca, J. (2010). *Crew Resource Management* (2nd ed.). Boston, MA: Academic Press.

Katz, D., & Kahn, R. L. (1952). Some recent findings in human relations research in industry. In G. Swanson, T. Newcomb, & E. Hartley (Eds.), *Readings in Social Psychology*. New York: Holt.

Katz, D., & Kahn, R. L. (Eds.). (1978). *The social psychology of organizations*. New York: John Wiley.

Katz, D., Maccoby, N., & Morse, N. (1950). *Productivity, supervision, and morale in an office situation*. Ann Arbor, MI: Institute for Social Research.

Katz, R. L. (1955). Skills of an effective administrator. *Harvard Business Review, January-February*, 33-42.

Keashly, L., Trott, V., & MacLean, L. M. (1994). Abusive behavior in the workplace: A preliminary investigation. *Violence and Victims, 9*(4), 341-357.

Keating, C. (1985). Human dominance signals: The primate in us. In E. S. L. & J. F. Dovidio (Eds.), *Power, dominance, and nonverbal behavior* (pp. 89-108). New York: Springer-Verlag.

Kenney, R. A., Blascovich, J., & Shaver, P. R. (1994). Implicit leadership theories: Prototypes for new leaders. *Basic and Applied Social Psychology, 15*(4), 409-437.

Kenny, D. A., & LaVoie, L. (1984). The social relations model. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 18, pp. 142-182). Orlando, FL: Academic Press.

Kets de Vries, M. F. R. (1993). The dynamics of family controlled firms: The good and the bad news. *Organizational Dynamics, 21*(3), 59-71.

Kim, C., Min, K. W., Yune, S. K., Choi, H., & Gong, E. Y. (2008). Employees' perceptions of interpersonal competence: The case of South Korea. *Asia Pacific Education Review, 9*(2), 221-232.

Kim, K. I., & Organ, D. (1982). Determinants of leader-subordinate exchange relationships. *Group and Organization Studies, 7*(1), 77-89.

Klann, G. (2007). *Building character: Strengthening the heart of good leadership*: Jossey-Bass Inc.,U.S.

Knouse, S. B., & Dansby, M. R. (1999). Percentage of work group diversity and work group effectiveness. *Journal of Psychology, 133,* 486-494. doi: 10.1080/00223989909599757

Krings, F., Bangerter, A., Gomez, V., & Grob, A. (2008). Cohort differences in personal goals and life satisfaction in young adulthood: Evidence for historical shifts in developemental tasks. *Journal of Adult Development, 15,* 93-105.

Lafferty, J. C., Eady, P. M., & Elmers, J. (1974). *The Desert Survival Problem*. Plymouth, MI: Experimental Learning Methods.

Lammers, J., Galinsky, A. D., Gordijn, E. H., & Otten, S. (2008). Legitimacy moderates the effect of power on approach. *Psychological Science, 19*(6), 558-564. doi: 10.1111/j.1467-9280.2008.02123.x

Langhorn, S. (2004). How emotional intelligence can improve management performance. *International Journal of Contemporary Hospitality Management, 16*(4/5), 220-230.

Lee, Y. (1989). *A study of the relationship between communication and job satisfaction among faculty at the junior colleges of technology in the republic of China.* Unpublished doctoral dissertation, Drake University, Les Moines, IA.

Leedom, D., & Simon, R. (1995). Improving team coordination: A case for behavior-based training. *Military Psychology, 7*(2), 109-122. doi: 10.1207/s15327876mp0702_5

Leffler, A., Gillespie, D., & Conaty, J. (1982). The effects of status differentiation on nonverbal behavior. *Social Psychology Quarterly, 45*(3), 153-161.

Lentz, B. F., & Leband, D. N. (1989). Why so many children of doctors become doctors, nepotism vs. human capital transfers. *The Journal of Human Resources, 24*(3), 396-408.

Liden, R. C., Wayne, S. J., & Stilwell, D. (1993). A longitudinal study on the early development of leader-member exchanges. *Journal of Applied Psychology, 78*(4), 662-674.

Likert, R. (1961). *New patterns of management*. New York: McGraw-Hill.

Likert, R. (1967). *The human organization*. New York: McGraw-Hill.

Linkey, H. E., & Firestone, I. J. (1990). Dyad dominance, composition effects, nonverbal behaviors, and influence. *Journal of Research in Personality, 24*(2), 206-215. doi: 10.1016/0092-6566(90)90017-Z

Lipman-Blumen, J. (2005). *The allure of toxic leaders: Why we follow destructive bosses and corrupt politicians and how we can survive them*. New York: Oxford University Press.

Littlepage, G. E. (1991). Effects of group size and task characteristics on group performance: A test of Steiner's model. *Personality and Social Psychology Bulletin, 17*(4), 449-456.

Locke, E. A. (1976). The nature and causes of job satisfaction. In M. D. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 1297-1349). Chicago: Rand McNally.

Locke, E. A. (1984). Job satisfaction. In M. M. Gruneberg & T. Wall (Eds.), *Social psychology and organizational behavior*. Chichester, UK: Wiley LTD.

Lombardo, M. M., Ruderman, M. N., & McCauley, C. D. (1988). Explanations of success and derailment in upper-level management positions. *Journal of Business and Psychology, 2*(3), 199-216.

Lord, R. G. (1985). An information processing approach to social perceptions, leadership, and behavioral measurement in organizations. In L. L. Cummings & B. M. Staw (Eds.), *Research in organizational behavior* (Vol. 7, pp. 87-128). Greenwich: CT: Press.

Lord, R. G., Brown, D. J., Harvey, J. L., & Hall, R. J. (2001). Contextual constraints on prototype generation and their multilevel consequences for leadership perceptions. *Leadership Quarterly, 12*(3), 311-338.

Magee, J. C., & Galinsky, A. D. (2008). Social hierarchy: The self-reinforcing nature of power and status. *The Academy of Management Annals, 2*(1), 351-398.

McCall, M. W. J., & Lombardo, M. M. (1983). Off the track: Why and how successful executives get derailed. *Technical Report* (Vol. 21). Greenboro, NC: Centre for Creative Leadership.

McClure, E. B. (2000). A meta-analytic review of sex differences in facial expression processing and their development in infants, children, and adolescents. *Psychological Bulletin, 126*(3), 424-453.

McFadyen, R. G. (1997). The relationship between powerless speech, agentic behavior, and amount of talk. *Journal of Social Psychology, 137*(4), 470-479.

McIntyre, R. H., Morgan, B. B. J., Salas, E., & Glickman, A. S. (1989). *Teamwork from team training: New evidence for the development of teamwork skills during operational training*. Orlando, FL: Naval Training Systems Command (Code 712).

McLennan, K. (1967). The manager and his job skills. *Academy of Management Journal, 10*(3), 235-245.

Mehrabian, A. (1972). *Nonverbal communication.* Chicago, IL: Aldine-Atherton.

Mhatre, K. H., Riggio, R. E., & Riggio, H. R. (in press). Nepotism and leadership, chapter 8. In R. G. Jones (Ed.), *Nepotism in organizations*. Missouri State University: A book for the Society for Industrial and Organizational Psychology, Frontiers series.

Milgram, S. (1965). Some conditions of obedience and disobedience to authority. *Human Relations, 18*(1), 57-76.

Mintzberg, H. (1973). *The nature of managerial work*. New York: Harper & Row.

Morey, J. C., Simon, R., Jay, G. D., Wears, R. L., Salisbury, M., Dukes, K. A., & Berns, S. D. (2002). Error reduction and performance improvement in the emergency department through formal teamwork training: Evaluation results of the MedTeams project. *Health Services Research, 37*(6), 1553-1581.

Morgeson, F. P., Reider, M. H., & Campion, M. A. (2005). Selecting individuals in team settings: The importance of social skills, personality characteristics, and teamwork knowledge. *Personnel Psychology, 58*(3), 583-611. doi: 10.1111/j.1744-6570.2005.655.x

Morrow, C. C., Jarrett, M. Q., & Rupinski, M. T. (1997). An investigation of the effect and economic utility of corporate-wide training. *Personnel Psychology, 50*(1), 91-119.

Motowidlo, S. J. (2003). Job performance. *Handbook of psychology*: John Wiley & Sons, Inc.

Mugny, G., Butera, F., Quiamzade, A., Dragulescu, A., & Tomei, A. (2003). Comparaisons sociales des compétences et dynamiques d'influence sociale dans les tâches d'aptitudes. *Année Psychologique, 103*(3), 469-496.

Mugny, G., Quiamzade, A., Pigière, D., Dragulescu, A., & Buchs, C. (2002). Self-competence, interaction style and expert social influence: Toward a correspondence hypothesis. *Swiss Journal of Psychology, 61*(3), 153-166.

Murphy, S. E., Blyth, D., & Fiedler, F. (1995). Cognitive ressource theory and the utilization of the leader's and group members' technical competence. *ARI Research Note, 95*(19), 1-19.

Nemiroff, P. M., & Pasmore, W. A. (1975). Lost at sea: A consensus-seeking task. In W. Pfeiffer & J. Jones (Eds.), *The 1975 annual handbook for group facilitators* (pp. 28-34). San Diego, CA: Pfeiffer.

Northouse, G. (2007). *Leadership theory and practice (4th ed)*. Thousand Oak, CA: Sage Publications.

O'Barr, W. M., & Atkins, B. K. (1980). "Women's language" or "powerless language"? In S. McConell-Ginet, R. Borker, & N. Furman (Eds.), *Women and language in literature and society* (pp. 93-110). New York: Praeger.

Operario, D., & Fiske, S. T. (2001). Effects of trait dominance on powerholders' judgments of subordinates. *Social Cognition, 19*(2), 161-180.

Orasanu, J., & Salas, E. (1993). Team decision making in complex environments. Decision making in action: Models and methods. In G. A. Klein, J. Orasanu, R. Calderwood, & C. E. Zsambok (Eds.), *Decision making in action: Models and methods* (pp. 327-345). Westport, CT: Ablex Publishing.

Orpen, C. (1995). Using the stepladder technique to improve team performance. *Team Performance Management, 1*(2), 24-27.

Overbeck, J. R., & Park, B. (2001). When power does not corrupt: Superior individuation processes among powerful perceivers. *Journal of Personality and Social Psychology, 81*(4), 549-565.

Padgett, M. Y., & Morris, K. A. (2005). Keeping it "all in the family": Does nepotism in the hiring process really benefit the beneficiary? *Journal of Leadership & Organizational Studies, 11*(2), 35-45.

Papa, M., & Graham, E. (1991). The impact of diagnosing skill deficiencies and assessment-based communication training on managerial performance. *Communication Education, 40*(4), 368-384.

Petty, M. M., & Bruning, N. S. (1980). A comparison of the relationships between subordinates' perceptions of supervisory behavior and measures of subordinates' job satisfaction for male and female leaders. *Academy of Management Journal, 23*(4), 717-725.

Petty, M. M., & Miles, R. H. (1976). Leader sex-role stereotyping in a female dominated work culture. *Personnel Psychology, 29*(3), 393-404. doi: 10.1111/j.1744-6570.1976.tb00423.x

Podsakoff, P. M., Todor, W. D., & Schuler, R. S. (1983). Leader expertise as a moderator of the effects of instrumental and supportive leader behaviors. *Journal of Management, 9*(2), 173-185. doi: 10.1177/014920638300900208

Posner, B. Z. (1987). What it takes to be a good project manager. *Project Management Journal, 18*(1), 51-54.

Prati, L. M., Douglas, C., Ferris, G. R., Ammeter, A. P., & Buckley, M. R. (2003). Emotional intelligence, leadership effectiveness, and team outcomes. *International Journal of Organizational Analysis, 11*(1), 21-40.

Price, K., H., & Garland, H. (1981). Compliance with a leader's suggestions as a function of perceived leader/member competence and potential reciprocity. *Journal of Applied Psychology, 66*(3), 329-336. doi: 10.1037/0021-9010.66.3.329

Ragins, B. R. (1992). Power and subordinate evaluations of male and female leaders. In L. A. M. Perry, L. H. Turner, & H. M. Sterk (Eds.), *Constructing and reconstructing gender. The links among communication, language, and gender*. Albany, NY: State University of New York Press.

Redding, W. C. (1972). *Communication within the organization: An interpretive review of theory and research*. New York: Industrial Communication Council.

Rice, R. W., Instone, D., & Adams, J. (1984). Leader sex, leader success, and leadership process: Two field studies. *Journal of Applied Psychology, 69*(1), 12-31.

Ridgeway, C. L. (1978). Conformity, group-oriented motivation, and status attainment in small groups. *Social Psychology Quaterly, 41*(3), 175-188.

Ridgeway, C. L., & Berger, J. (1986). Expectations, legitimation, and dominance behavior in task groups. *American Sociological Review, 51*(5), 603- 617.

Ridgeway, C. L., & Diekema, D. (1989). Dominance and collective hierarchy formation in male and female task groups. *American Sociological Review, 54*(1), 79-93.

Riggio, R. E. (1986). Assessment of basic social skills. *Journal of Personality and Social Psychology, 51*(3), 649-660.

Riggio, R. E. (Ed.). (1996). *Introduction to industrial/organizational psychology*. New York: HarperCollins.

Riggio, R. E. (2001). Interpersonal sensitivity research and organizational psychology: Theoretical and methodological applications. In J. A. Hall & F. Bernieri (Eds.), *Measurement of interpersonal sensitivity* (pp. 305-317). Mahwah, NJ: Erlbaum.

Riggio, R. E., & Carney, D. C. (2003). *Manual for the Social Skills Inventory* (2nd ed.). Montain View, CA: Mind Garden.

Riggio, R. E., & Reichard, R. J. (2008). The emotional and social intelligences of effective leadership: An emotional and social skill approach. *Journal of Managerial Psychology, 23*(2), 169-185.

Riggio, R. E., Riggio, H. R., Salinas, C., & Cole, E. J. (2003). The role of social and emotional communication skills in leader emergence and effectiveness. *Group Dynamics: Theory, Research, & Practice, 7*(2), 83-103.

Riggio, R. E., & Taylor, S. J. (2000). Personality and communication skills as predictors of hospice nurse performance. *Journal of Business and Psychology, 15*(2), 351-359.

Riggio, R. E., & Zimmerman, J. A. (1991). Social skills and interpersonal relationships: Influences on social support and support seeking. In W. H. Jones & D. Perlman (Eds.), *Advances in personal relationships* (Vol. 2, pp. 133-155). London, UK: Jessica Kingsley Press.

Robbins, S. P., & Judge, T. A. (2009). *Organizational behavior* (13th ed.). Upper Saddle River, NJ: Pearson Education International.

Robert, G., & Hockey, J. (1997). Compensatory control in the regulation of human performance under stress and high workload: A cognitive-energetical framework. *Biological Psychology, 45*, 73-93. doi: 10.1016/S0301-0511(96)05223-4

Roch, S. G., & Ayman, R. (2005). Group decision making and perceived decision success: The role of communication medium. *Group Dynamics: Theory, Research, & Practice, 9*(1), 15-31.

Salas, E., Burke, C. S., Bowers, C. A., & Wilson, K. A. (2001). Team training in the skies: Does crew resource management (CRM) training work? *Human Factors, 43*(3), 490-511.

Salas, E., DiazGranados, D., Klein, C., Burke, C. S., Stagl, K. C., Goodwin, G. F., & Halpin, S. M. (2008). Does team training improve team performance? A meta-analysis. *Human Factors, 50*(6), 903-933.

Salas, E., Dickinson, T. L., Converse, S. A., & Tannenbaum, S. I. (1992). Toward an understanding of team performance and training. In R. W. Swezey & E. Salas (Eds.), *Teams: Their training and performance* (pp. 3-29). Norwood, NJ: Ablex.

Salas, E., Nichols, D. R., & Driskell, J. E. (2007). Testing three team training strategies in intact teams. *Small Group Research, 38*(4), 471-488. doi: 10.1177/1046496407304332

Salas, E., Prince, C., Bowers, C. A., Stout, R., Oser, R., & Cannons-Bowers, J. (1999). A methodology for enhancing crew resource management training. *Human Factors, 41*(1), 161-172. doi: 10.1518/001872099779577255

Sauer, J., Hockey, G. R. J., & Wastell, D. (1997, June 29 - July 4). *The effects of training on immediate and long-term skill retention in a process control task: Applications to extended spaceflight.* Paper presented at the 3th Triennial Congress of International Ergonomics Association, Tampere, Finland.

Sauer, J., Wastell, D., & Hockey, G. R. J. (1999). Multiple-task performance on a computer-simulated life support system during a space mission simulation. *Acta Astronautica, 44*(1), 43-52.

Sauer, J., Wastell, D. G., & Hockey, G. R. J. (2000). A conceptual framework for designing micro-worlds for complex work domains: A case study of the Cabin Air Management

System. *Computers in Human Behavior, 16*(1), 45-58. doi: 10.1016/s0747-5632(99)00051-5

Schmid Mast, M. (2002). Dominance as expressed and inferred through speaking time: A meta-analysis. *Human Communication Research, 28*(3), 420-450.

Schmid Mast, M. (2010). Interpersonal behavior and social perception in a hierarchy: The Interpersonal Power and Behavior Model. *European Review of Social Psychology, 21*(1), 1-33.

Schmid Mast, M., & Hall, J. A. (2003). Anybody can be a boss but only certain people make good subordinates: Behavioral impacts of striving for dominance and dominance aversion. *Journal of Personality, 71*(5), 871-891.

Schmid Mast, M., Hall, J. A., & Schmid, P. C. (2010). Wanting to be boss: Beneficial effects on task performance in dyads. *Journal of Applied Psychology, 40*(2), 458-472.

Schmid Mast, M., Jonas, K., & Hall, J. A. (2009). Give a person power and he or she will show interpersonal sensitivity: The phenomenon and its why and when. *Journal of Personality and Social Psychology, 97*(5), 851-865. doi: 10.1037/a0016234

Schmid Mast, M., Murphy, N. A., & Hall, J. A. (2006). A brief review of interpersonal sensitivity: Measuring accuracy in perceiving others. In D. Cadee & J. Young (Eds.), *Current themes in social psychology* (pp. 163-185). Trinidad: University of the West Indies Press.

Schwab, D. P., & Cummings, L. L. (1970). Theories of performance and satisfaction: A review. *Industrial Relations, 9*(4), 408-430.

Seta, J. J. (1982). The impact of comparison processes on coactors' task performance. *Journal of Personality and Social Psychology, 42*(2), 281-291. doi: 10.1037/0022-3514.42.2.281

Sharbrough, W. C., Simmons, S. A., & Cantrill, D. A. (2006). Motivating language in industry. *Journal of Business Communication, 32*(4), 329-344.

Shartle, C. L. (1950). Studies of leadership by interdisciplinary methods. In A. G. Grace (Ed.), *Leadership in American education*. Chicago, IL: University of Chicago Press.

Shechtman, N. (2002). *Talking to people versus talking to computers: Impersonal goals as a distinguishing factor*. Unpublished doctoral dissertation, Stanford University Stanford, CA.

Shipper, F., & Wilson, C. L. (1991). *The impact of managerial behaviors on group performance, stress, and commitment*. Paper presented at the Impact of Leadership Conference, Center for Creative Leadership, Colorado Springs, CO.

Slack, C. (2001). Breeding success. *MBA Jungle, September*, 82-88.

Slusher, A., Dyke, J. V., & Rose, G. (1972). Technical competence of group leaders, managerial role, and productivity in engineering design groups. *The Academy of Management Journal, 15*(2), 197-204.

Smither, J. W., London, M., Reilly, R. R., Flautt, R., Vargas, Y., & Kucine, I. (2004). Discussing multisource feedback with raters and performance improvement. *Journal of Management Development, 23*(5), 456-468.

Snyder, R. A., & Bruning, N. S. (1985). Quality of vertical dyad linkages: Congruence of supervisor and subordinate competence and role stress as explanatory variables. *Group & Organization Studies, 10*(1), 81-94.

Steiner, I. D. (1972). *Group processes and productivity*. New York: Academic Press.

Stogdill, R. M. (1974). *Handbook of leadership: A survey of the literature*. New York: Free Press.

Tavernier, G. (1980). Using employee communications to support corporate objectives. *Management Review, 69*(11), 8-13.

Tepper, B. J. (2000). Consequences of abusive supervision. *Academy of Management Journal, 43*(2), 178-190.

Tepper, B. J., Duffy, M. K., & Shaw, J. D. (2001). Personality moderators of the relationship between abusive supervision and subordinates' resistance. *Journal of Applied Psychology, 86*(5), 974-983.

Tepper, B. J., Henle, C. A., Lambert, S. L., & Giacalone, R. A. (2008). Abusive supervision and subordinates' organization deviance. *Journal of Applied Social Psychology, 93*(4), 721-732.

Tiedens, L. Z. (2001). Anger and advancement versus sadness and subjugation: The effects of negative emotion expressions on social status conferral. *Journal of Personality and Social Psychology, 80*(1), 86-94.

Tiedens, L. Z., & Fragale, A. R. (2003). Power moves: Complementarity in dominant and submissive nonverbal behavior. *Journal of Psychology and Social Psychology, 84*(3), 558-568.

Tiedens, L. Z., & Jimenez, M. C. (2003). Assimilation for affiliation and contrast for control: Complementary self-construals. *Journal of Personality and Social Psychology, 85*(6), 1049-1061.

Tsui, A. S. (1984). A role set analysis of managerial reputation. *Organizational Behavior and Human Performance, 34*(1), 64-96.

Tubbs, S., & Widgery, R. N. (1978). When productivity lags, are key managers really communicating? *Management Review, 67*, 20-25.

Tusing, K. J., & Dillard, J. P. (2000). The sounds of dominance: Vocal precursors of perceived dominance during interpersonal influence. *Human Communication Research, 26*(1), 148-171.

Van Vugt, M. (2006). Evolutionary origins of leadership and followership. *Personality & Social Psychology Review, 10*(4), 354-371.

Van Vugt, M., Hogan, R., & Kaiser, R. B. (2008). Leadership, followership, and evolution: Some lessons from the past. *American Psychologist, 63*(3), 182-196.

Vecchio, R. P., & Gobdel, B. C. (1984). The vertical dyad linkage model of leadership: Problems and prospects. *Organizational Behavior and Human Performance, 34*(1), 5-20.

Vonk, R., & Konst, D. (2003). Effects of behavioral causes and consequences on perceived competence of leaders and subordinates. *Journal of Applied Social Psychology, 33*(8), 1684-1692.

Walker, H. A., Ilardi, B. C., McMahon, A. M., & Fennell, M. L. (1996). Gender, interaction, and leadership. *Social Psychology Quarterly, 59*(3), 255-272.

Warrenfeltz, R. B. (1995). *An executive-level validation of the Borman and Brush taxonomy*. Paper presented at the 10th Annual Conference of the Society for Industrial and Organizational Psychology, Orlando, FL.

Watkins, M. (2003). *The first 90 days*. Cambridge, MA: Harvard Business School Press.

Wehr, P., Burgess, H., & Burgess, G. M. (Eds.). (1994). *Justice without violence*. Boulder, CO: Lynne Rienner Publishers.

Willits, R. D. (1967). Company performance and interpersonal relations. *Industrial Management Review, 8*(2), 91-107.

Wong, C., & Law, K. S. (2002). The effects of leader and follower emotional intelligence on performance and attitude: An exploratory study. *The Leadership Quarterly, 13*(3), 243-274.

Yukl, G. A. (2010). *Leadership in organizations* (7th ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Table of figures

Table of tables

ARTICLE 1

Darioly, A., & Schmid Mast, M. (2011). Facing an incompetent leader: The effects of a non-expert leader on subordinates' perception and behavior. *European Journal of Work and Organizational Psychology*, *20*(2), 239–265. doi: 10.1080/13594320903429576.

Running Head: EFFECTS OF AN INCOMPETENT LEADER

Facing an Incompetent Leader:

The Effects of a Non-Expert Leader on Subordinates' Perception and Behavior

Annick Darioly

University of Neuchatel

Marianne Schmid Mast

University of Neuchatel

Address correspondence to: Annick Darioly, Department of Work and Organizational Psychology, University of Neuchatel, Rue de la Maladiere 23, CH-2000 Neuchatel, Switzerland, phone: +41-32-718-1458, fax: +41-32-718-1391 email: annick.darioly@unine.ch .

Abstract

We investigated the effects of a leader's task-incompetence on how subordinates perceive and interact with their leader. In Study 1, 80 participants in a subordinate role interacted via email and in Study 2, 80 participants interacted face-to-face with either a competent or an incompetent leader on a problem-solving task. Participants' dominance behavior, how much they resisted the leader's influence, their perception of the leader, and their task involvement were assessed. As predicted, subordinates perceived the leader's incompetence as a lack of power and compensated for it by taking on a more powerful position themselves (i.e., more dominance behavior, more resistance to the leader's influencing attempts). In sum, having a task-incompetent leader affects not only the subordinates' perception of the leader but also how the subordinate interacts with the leader.

Keywords: interaction, leader, subordinate, competence, dominance, influence

This research was supported by a grant from the Swiss National Science Foundation PP0011-106528 to the second author. We thank Nicole Shechtman who sent us her web-based computer program and Steve Casera who adapted it for our task. We also thank Melanie Gschwind and Jean-Marie Gessler for their help in Study 1's data collection, and the eight students involved in the project for their help in Study 2's data collection. We also thank Gaetan Cousin for coding, and Adrian Bangerter and Petra Schmid for their helpful comments on earlier drafts of this manuscript.

Facing an Incompetent Leader:

The Effects of a Non-Expert Leader on Subordinates' Perception and Behavior

Leader-subordinate interactions are important to study because leaders can affect considerably the way subordinates see themselves and their jobs. Having a poor leader-subordinate relationship (e.g., lack of supportiveness, of effective communication, or of feedback) has been shown to reduce individual well-being and is one of the most stressful situations in the workplace (e.g., Hogan, 2007; House, 1981; Tepper, 2000). Subordinates' dissatisfaction with their leader not only affects the subordinates' well-being but also the company as a whole, for instance by an increase in turnover and strikes (Hamblin, Miller, & Wiggins, 1961). It has been said countless times: "People don't leave companies, they leave bosses".

One factor that influences the quality of the leader-subordinate relationship is the leader's competence or perceived lack thereof by the subordinate. As an example, the Society of Human Resource Management conducted a study showing that more than 20% of workers resign from their jobs because they perceive their leader as incompetent (Weinstein, 2007). Moreover, incompetent leaders are featured in jokes and cartoons and performing a Google search for "incompetent boss" confirms that negative evaluations by employees of their leader's competence are extremely widespread. Whether this criticism refers to task-competence or social competence remains open in such global statements.

The present studies are concerned with the lack of *task-competence* or *expertise* of the leader as it is perceived by the subordinate. By competence we mean the contribution a person is able to make to solve a specific task (i.e., expertise). It goes without saying that not every leader is required to possess the same (or better) task-competence than his or her subordinates. As an example, a bank director does not have to know all the details of a bank clerk's job and he or she does also not have to possess the specific knowledge of the bank's

financial analysts to successfully manage the bank. Nevertheless, task-competence or expertise of the leader matters in many situations and often it is the case that superiors are more task-competent than their subordinates. Focusing on task-competence of the leader is not a new idea but one that has been neglected in comparison to the study of social competence of the leader. Many of the currently used leadership models focus on the importance of social skills and leadership charisma while neglecting task-competence or so-called instrumental leadership aspects (Antonakis, 2006). Also, empirical evidence to illustrate the importance of task-competence for a leader exists. As an example, Tsui (1984) demonstrated that successful leaders of accounting departments are generally better accountants than their subordinates. Another example would be the academic context in which the doctoral student is supposed to learn directly from the professor's expertise. Moreover, having an incompetent (non-expert) leader affects team outcome. For instance, Hamblin et al. (1961) showed that if the leader is perceived as less technically competent than the other team members, the morale of the team is low and low morale is supposed to result in low productivity, high turnover of employees, and strikes. Justis, Kedia, and Stephens (1978) investigated how a trainer's power position together with his or her task-competence affected trainees' level of performance. Their results showed that the level of team performance increased when the technically competent person was in charge. Moreover, Sauer, Darioly, Schmid Mast, Schmid, and Bischof (2009) found performance decrements in teams with a non-expert leader.

Besides effects on team outcomes and performance, leader task-competence also affects how subordinates perceive their leader (e.g., Lombardo, Ruderman, & McCauley, 1988) and how this perception affects subordinate behavior (Tepper, 2000). As an example, Hollander (1985) found that decisions of individuals who have previously shown to be task-competent were respected more by team members. In the present research, we investigate how

subordinates' perception of and interaction with a leader are affected by how task-competent the leader is perceived by the subordinate.

The superior-subordinate relationship is characterized by a power difference. Power, status, and dominance are all indicative of a vertical dimension or hierarchy among social interaction partners (Hall, Coats, & Smith LeBeau, 2005). *Power* means the extent to which an individual exerts or can exert control or influence over another person (Schmid Mast, Jonas, & Hall, in press). We understand *status* as a role linked to a specific position within a hierarchy. This definition is similar to what other researchers use. As an example, Ellyson and Dovidio (1985, p. 7) say that status "…is a characteristic involving one's relative position in a prestige hierarchy that is used as an organizing scheme upon which beliefs and evaluations are based". Thus, based on the different expectations related to an individual being in the high or low status position, leaders and subordinates are perceived and evaluated differently. *Dominance* is used in the present research in different ways (personality dominance, dominance behavior, and perceived dominance). *Personality dominance* is defined as "a desire and a predisposition to attempt to influence others" (Ellyson & Dovidio, 1985, p. 7). It is usually measured with self-report questionnaires such as the Personality Research Form (PRF; Jackson, 1984), also used in the present research. People who score high on trait dominance describe themselves as ambitious, assertive, and self-confident (Gough, 1987). Personality dominance and its impact on superior-subordinate interactions have been studied for several decades and it has been shown that individuals with low or high dominant personalities behave differently (Assor, Aronoff, & Messé, 1981; Operario & Fiske, 2001; Schmid Mast & Hall, 2003). We define *dominance behavior* as a behavior that is typically used to gain or maintain control or influence over another or behaviors that are frequently used by high status individuals more so than by low status ones. There are many examples of dominance behavior documented in the literature (Hall et al., 2005). In the

present research, we focus on dominance expressed in speech acts. Dominance in speech behavior has been described as imposing and strongly defending one's personal opinions and preferences in discussions (Schmid Mast & Hall, 2003) and the term "powerless speech" refers to "the frequent use of a number of speech-style features (qualifiers, fillers, and hesitations) usually viewed as signs of tentativeness or uncertainty" (McFadyen, 1997, p. 407). *Perceived dominance* is the impression an observer or interaction partner has of a target's power. This impression is based on the perceived or known status of the target and his or her exhibited dominance behavior. To illustrate, in the superior-subordinate relationship, the leader can be perceived differently, depending on his or her level of exhibited dominance behavior (Schmid Mast & Hall, 2003). Because perceived dominance is in the eye of the beholder, it is typically assessed with a self-report measure (Halberstadt & Saitta, 1987; Tusing & Dillard, 2000).

Expectation States Theory (EST; Berger, Fisek, Norman, & Zelditch, 1977) posits that status hierarchies form according to how much each team member is able to contribute to the task solution, thus according to each team member's competence level. In an EST approach, team members harbor performance expectations about each other. A performance expectation is a "generalized anticipation of one's own or another's capacity to make useful contributions to the task" (Ridgeway & Berger, 1986, p. 604). Performance expectations can stem from specific status cues such as, for instance, expertise and because they are shared by all team members, they become self-fulfilling prophecies. To illustrate, when a team member is perceived as having expertise, the other team members expect this particular team member to perform particularly well in the task (i.e., high performance expectation). Such performance expectations shape the group members' behavior in that the persons towards whom the group harbors high performance expectations are given more opportunities to contribute, their contributions are valued more, and they finally gain more influence in the team, thus more

status or power. So in theory, when a hierarchy forms, the person perceived as the most competent one will become the leader. If this is true, it means that individuals who are perceived as competent (or incompetent) are also perceived as dominant (or less dominant). Indeed, research shows that dominance or leadership is associated with competence. For instance, Bass (1990) showed that task-competence was correlated with leadership and typically, scales measuring dominance are correlated with scales measuring competence (Wiggins & Broughton, 1985; Wiggins, Phillips, & Trapnell, 1989). Also, individuals who have verbal fluency, maintain eye contact, and speak more often (all signs of dominance; Hall et al., 2005; Schmid Mast, 2002) not only occupy higher positions in the team hierarchy but are also perceived as more competent (Berger, Webster, Ridgeway, & Rosenholtz, 1986; Ridgeway & Diekema, 1989).

Thus, we predict that competence is not only a marker of dominance when hierarchies form but that even in established hierarchies differences in leader competence will affect the degree to which a leader is perceived as dominant. More specifically, we expect that incompetent leaders will be perceived as less dominant than competent ones (Hypothesis 1).

In general, high-power individuals behave dominantly (e.g., express their preference or opinion and defend it) and low-power individuals behave submissively (e.g., agree with the superior's point of view and express their preference hesitantly if at all) (e.g., DePaulo & Friedman, 1998; Schmid Mast & Hall, 2003). However, not every leader behaves equally dominantly and not every subordinate behaves equally submissively. For instance, how much a person is motivated to occupy a high or low power position affects expressed dominance in subordinates (Schmid Mast & Hall, 2003).Whether an individual possesses a power position that is legitimate as compared to illegitimate has shown to affect his or her behavioral outcomes. As an example, in the Lammers, Galinsky, Gordijn, and Otten (2008) study, the

powerful showed more approach behavior than the powerless only when the power position was legitimate but not when it was illegitimate.

Tiedens and Fragale (2003) showed that in peer groups, people behave more dominantly with a less dominant interaction partner and they behave less dominantly with a more dominant interaction partner; there is thus complementarity in dominance behavior among equal status social interaction partners. In other words, the more dominant the social interaction partner is perceived, the less dominantly one behaves and vice versa. In an established hierarchy, the expectation is that the high power individual behaves more dominantly than the low power individual. In an EST approach, differences in competence correspond to differences in status so if a leader lacks task-competence, he or she is in a situation of illegitimacy. More specifically, we suggest that when the leader is illegitimate (i.e., low competent), this will be seen as weakening of his or her power position when compared to a legitimate (i.e., competent) leader, resulting in more dominance behavior of the subordinate when compared to the dominance behavior of a subordinate with a legitimate leader. Subordinates thus react towards illegitimate leaders less according to the leader's high status but rather according to how dominantly the leader is perceived. Indeed, research showed that subordinates of illegitimate leaders were more likely to resist and challenge the leader's decisions and directives (Wehr, Burgess, & Burgess, 1994). In other words, those subordinates showed more pronounced resistance to their leader's influence. Accordingly, we expect that subordinates of incompetent leaders will behave more dominantly towards their leaders than subordinates of competent leaders (Hypothesis 2) and that subordinates will be more resistant to their leader's influence when the leader is incompetent than when the leader is competent (Hypothesis 3). Moreover, we hypothesize that perceived leader dominance will mediate both of these relations (Hypotheses 4 and 5).

Adopting more of a leadership role when with an incompetent leader might not only bring about more subordinate dominance behavior but might also entail feeling more responsible for the task outcome and therefore investing more effort into the task resolution. Indeed, Williams and Karau (1991) showed that when the task is meaningful for the individual, he or she invested more effort in a dyadic task when the dyad partner was incompetent. Moreover, when individuals perceived their partner as competent, they invested less effort because they thought that the partner was in principle able to perform the task alone and that their contribution is unnecessary ("free-rider mechanism"; Kerr, 1983). Based on these results, we predict that subordinates of incompetent leaders will show more task involvement than subordinates of competent leaders (Hypothesis 6).

In sum, we predict that subordinates perceive the leader's lack of competence as a lack of dominance and thus compensate for this by taking on a more powerful position themselves. This position is characterized by behaving in a more dominant way during the interaction with the leader, by being more resistant to the influencing attempts of the leader, and by putting more effort into the task. We tested these hypotheses in two studies.

Study 1

Method

Participants

Participants were 49 women and 31 men (M_{age} = 25, *SD* = 3.09, range: 20 – 35), mostly (86%) students majoring in different areas (e.g., psychology, arts, law) and some (14%) employees (e.g., teacher, administrator). We excluded students in computer sciences, pharmacy, and medicine for reasons explained later. Participants had the opportunity to win one out of four 100 CHF prizes for participation.

Procedure

After having signed an informed consent form, participants were instructed that they would interact in a problem-solving task with another student from another university via email. The problem-solving task consisted of assembling a priority list of items to be put in a first aid kit. Participants were informed that one of the dyad members would be the leader and one the subordinate and that the roles would be allocated to them randomly. Participants were told that the leader role entailed the evaluation of the subordinate and that the role of the subordinate entailed submitting the final task solution to the leader for evaluation. The role assignment was, however, not random; the participant was always assigned to the subordinate role. Moreover, unbeknownst to them, participants were randomly assigned to interact with either a task-competent or a task-incompetent leader.

Prior to the interaction with the leader, participants were asked to fill in a questionnaire on personality dominance. They were then asked to prioritize 12 items for a first aid kid and to communicate their ranking to their leader. The leader's ranking (generated by the computer, explained in more detail below) was then revealed to the participant. The dyad's task was to discuss each item and after the discussion the participant had to come to a final ranking to be submitted to the leader for evaluation.

After the interaction, participants were asked to indicate how realistic they perceived the interaction to have been, how dominant and how competent they perceived the leader to be, how much they liked the leader, how much they liked their assigned assistant role, how attractive the task was to them, and how involved in the task they felt. Based on the written email exchange, uninvolved raters coded dominance behavior of the participant (expression of dominance and powerless speech). Also, resistance to leader influence was assessed by comparing how much participants were influenced in their final ranking by the leader's ranking (explained in more detail later).

Materials

Problem-solving task. We set out to create a task that would be interesting to participants but in which the general task-competence would be low in order to forestall for initial competence differences to affect the results. Based on the NASA Moon Survival Problem which has been used extensively in previous studies (e.g., Linkey & Firestone, 1990; Orpen, 1995) a new task was created, the "First Aid Kit Problem". In order to maintain task-competence comparable (and low in this case) among participants, we excluded students in pharmacy and in medicine. The "First Aid Kit Problem" consists of a list of 12 items (e.g., sunscreen lotion, bandages, or mosquito lotion) that need to be prioritized in order to travel four weeks in Peru. Because of lack of space in the luggage, the task of the participants was to rank order the items from 1 to 12 according to their importance. We decided to create a new task because (a) the NASA Moon Survival Problem might be too well-known and (b) we needed a task with no objectively correct answer because it was important that the interaction partner could argue in both directions, meaning in favor of placing the object higher or lower on the priority list. The leader's priority list was generated by the computer program contingent upon the participants' ranking according to an algorithm ensuring that the gap between the leader's and the participant's ranking was constant (e.g., for the item ranked 6 by the participant, the leader would always rank it 11, for the item ranked 9 by the participant, the leader would always rank it 3[1]). Therefore, it was important that each item could plausibly be ranked higher or lower in priority with equally good arguments. To illustrate, the argument for placing an item (e.g., sunscreen lotion) higher in priority was: "… The best protection against the sun is *sunscreen lotion.* I suggest that you rank it *higher* in the list." The argument for placing this item lower in priority was: "… The best protection against the sun is: *clothes, sunglasses, and a hat*. I suggest that you rank it (sunscreen lotion) *lower* in the list."

The experimenter scripted the email exchange; the leader was thus fictitious. Students in computer sciences were excluded as participants; we wanted to minimize the risk of them guessing that the other participant was not real. We chose to use a male leader because in Swiss organizations, 70% of leaders are men (Laessig, Moresi, Siegenthaler, & Vuille, 2006). To make the simulated interaction more realistic, participants received a first email from the (virtual) leader in which he introduced himself either as a student in pharmacy (task-competent condition) or as a student in history (task-incompetent condition). Participants then responded to this email by also introducing themselves.

Only then did participants communicate their initial rank of the items to the leader upon which the leader's ranking appeared next to the participant's one on the computer screen. Participants were instructed to discuss each of the 12 items via email with the leader. For each item, the participant wrote an email justifying the ranking of the item. The leader then sent an email back explaining his choice and suggesting a higher or lower ranking of the item in question. To make the conversation credible, the time between the participant sending his or her message and the receiving of the leader's message varied according to the length of the leader's message. For each of the 12 items there was only one email exchange and the items were discussed always in the same order regardless of the participant's or the leader's ranking of the individual items. At the end of the interaction, participants had to compile the final ranking which they submitted for evaluation to the leader.

We then asked the participants to write an email to the experimenter and describe their impressions about the interaction in general. We coded these impressions to check whether participants believed the cover story and assumed that there really was another participant with whom they interacted. Results showed that 39 (48%) did not mention anything about how real they found the interaction, 33 (41%) said that they did not find it very realistic because they could exchange their opinion only once for each item, and 9 (11%) explicitly

mentioned that they did not believe that there was a real other person in the leader role. Because the results did not change when we dropped those 9 participants, they remained in the subject pool.

Leader competence manipulation. In the competent condition, participants interacted with a student in pharmacy as the leader and in the incompetent condition with a student in history. Moreover, the communication style of the competent and incompetent leader varied throughout the interaction while the content of the information exchanged remained the same for both conditions. To illustrate, participants interacting with a competent leader received the following message (with respect to the mosquito lotion): "*During my courses on* exotic infections, *I learned* that the mosquito lotion is 100% effective. Protection with clothes only *is* not enough. The mosquito lotion *should* be ranked higher". In contrast, the incompetent leader said the following: "*I have no knowledge about* exotic infections, *but I think* that the mosquito lotion is 100% effective. Protection with clothes only *seems* not enough. The mosquito lotion *could* be ranked higher."

Perceived leader dominance. The subordinate's perception of the leader's dominance was measured after the interaction with three items (1 reverse scored) on a 5-point Likert scale (1 = *do not at all agree*, 5 = *completely agree*). Sample items are: "During the interaction, I felt inferior to my leader" or "I was more dominant than my leader during the interaction" (reverse scored). Scores were averaged *(M* = 3.03, *SD* = 0.94, Cronbach's alpha = .80).

Dominance behavior. Based on the written email exchange, each of the participants' 12 messages was rated according to whether it contained an expression of dominance or not on a yes (contains an expression of dominance) or no (does not contain an expression of dominance) scale and then summed up across the 12 messages. This was done by 2 raters (interrater reliability: mean r = .82). Raters were provided with the following description of

dominance: A high dominance statement is characterized by expressing a strong personal preference or opinion and by stating opinions or positions in an unbending manner (e.g., "Bandages must be ranked higher than you suggested because we are in the forest and it is easy to get injured."), whereas a low dominance statement is characterized by assuring the other of not having a preference (e.g., "I don't really have arguments for this object and it doesn't matter, thus I'm open to any of your suggestions.") or by expressing the own preference hesitantly (e.g., "mhm… maybe it's something useful.") (Schmid Mast & Hall, 2003). Dominance ratings were summed up across all the 12 exchanges (M = 5.32, SD = 2.26, range: 0.5 – 12).

Moreover, powerless speech of the written email exchange was assessed because powerless speech is an indicator of low dominance (e.g., Fragale, 2006; McFadyen, 1997; O'Barr & Atkins, 1980). Each email exchange was coded on powerless speech by 2 raters on a yes (powerless speech present) or no (powerless speech absent) scale (interrater reliability: mean r = .75). Only qualifiers ("maybe", "probably", "possibly") and fillers ("like", "you see") were included. Hesitations such as repetition of words or self-correction did not occur in the written emails. Powerless speech ratings were summed up across all 12 exchanges (M = 0.68, SD = 1.06, range: 0 – 6).

Because expressions of dominance and powerless speech significantly correlated (r = -.42, p = .0001), we combined them into a new variable called *dominance behavior* after reversing the powerless speech variable and z-scoring both variables[2].

Resistance to leader influence. To determine the subordinate's resistance to leader influence, we calculated for each item, the absolute difference between the leader's ranking and the subordinate's initial ranking and summed them up (= initial gap[3]), and we also calculated for each item, the absolute difference between the leader's ranking and the subordinate's final ranking (= final gap). We then subtracted the final from the initial gap (see

Moon, 1999). Lower scores indicate more subordinate's resistance to leader influence *(M* = 18.38, *SD* = 9.54, range: 2 – 44). Note that although difference scores can be problematic in terms of reliability (Cronbach & Furby, 1970), they not necessarily have to be (Collins, 1996). Reliability can be low and the difference measure can still be an accurate measure of change because it reflects intraindividual change.

Task involvement. Task involvement refers to having one's attention focused on the task (Nicholls, 1983). Participants responded after the interaction to four items (2 reverse scored) developed by the researchers. Sample items are: "I worked in an involved way in the interaction" or "I did not perform the task scrupulously" (reverse scored). The four items were measured on the same 5-point Likert scale as perceived leader dominance and the scores of the 4 items were averaged *(M* = 4.39, *SD* = 0.49, Cronbach's alpha = .58).

Personality dominance. Trait dominance was measured prior to the interaction with a French version of the dominance scale of the Personality Research Form (PRF; Jackson, 1984). Participants indicate for each of the 16 items whether it describes them correctly or not (8 reverse scored). Sample items are: "I would be a powerful commander in the army" or "I avoid power positions" (reverse scored). Scores on the items were averaged (*M* = 0.50, *SD* = 0.26, Cronbach's alpha = .85) and higher scores indicate more dominance.

Manipulation check scales. In order to ascertain that the leader competence manipulation only touched how competent the leader was perceived but not how realistic the participants perceived the interaction to have been, how much they liked their leader, how attractive they found the task at hand, and how much they liked their assigned subordinate role when interacting with a competent or an incompetent leader, we administered different manipulation check scales after the interaction. All items were developed by the researchers and measured on the same 5-point Likert scale (1 = *do not at all agree*, 5 = *completely agree*). Scores for each scale were averaged. How competent participants perceived their

leader to be (*perceived leader competence)* was assessed with 6 items (3 reverse scored) such as “My leader was very competent” or “I was more competent than my leader” (reverse scored) (*M* = 3.16, *SD* = 0.76, Cronbach’s alpha = .80). *Perceived realism of the interaction* was measured with the following two items: “I found that the interaction was realistic” and “I found that the interaction was not natural” (reverse scored) (*M* = 2.78, *SD* = 1.09, Cronbach’s alpha = .83). *Leader liking* was measured with four items (2 reverse scored). Sample items are: “My leader was agreeable” or “My leader was not nice” (reverse scored) (*M* = 3.27, *SD* = 1.00, Cronbach’s alpha = .85). To evaluate how attractive the subordinate found the task (*perceived task attractiveness*), participants responded to four items (2 reverse scored) such as “I found the task very interesting” or “I found that the task was boring” (reverse scored) (*M* = 3.90, *SD* = 0.69, Cronbach’s alpha = .83). To evaluate the subordinate’s liking of the assigned subordinate role (*role liking*), six items (3 reverse scored), such as “I liked my role” or “I would prefer the role of the leader” (reverse scored) were used (*M* = 3.76, *SD* = 0.65, Cronbach’s alpha = .78).

Results

As predicted, competent leaders (*M* = 3.51) were perceived as more competent than incompetent ones (*M* = 2.81), *t*(78) = 4.61, *p* = .0001, confirming that the manipulation of competence was successful. We aimed for the interaction with the competent and with the incompetent leader to be equally realistic and equally attractive for participants. This is exactly what we found: there was no significant difference in perceived realism of the interaction between interactions with a competent and with an incompetent leader, *t(*78) = 1.60, *p* = .11, no significant difference in liking of the competent or incompetent leader, *t(*78) = 1.34, *p* = .18, and no difference in perceived task attractiveness when interacting with a competent or incompetent leader, *t(*78) = 0.48, *p* = .63. Moreover, there was no significant

difference in role liking when interacting with a competent or incompetent leader, $t(78) = 0.49$, $p = .63$.

We predicted that an incompetent leader would be perceived as less dominant than a competent one (H1). We calculated a 2 (leaders' competence: competent vs. incompetent) by 2 (gender of the participant) ANOVA with perceived leader dominance as the dependent variable and we entered personality dominance as a covariate to control for the potential influence of trait dominance. The main focus of this research was not on gender. However, because research on power often shows gender differences, we included the variable in our analyses to control for its potential effect on the results.

Results confirmed the prediction in that there was a significant leader competence main effect, showing that competent leaders were perceived as more dominant than incompetent ones (Table 1). There was no significant gender main effect, $F(1, 75) = 1.28$, $p = .26$, and no significant interaction effect, $F(1, 75) = 0.44$, $p = .51$.

We expected subordinates of incompetent leaders to behave more dominantly in the interaction than subordinates of competent leaders (H2). We calculated the same ANOVA as above for dominance behavior as the dependent variable. Results confirmed a significant main effect of leader competence, meaning that subordinates of incompetent leaders expressed more dominance in their emails than subordinates of competent leaders (Table 1). There was no significant gender main effect, $F(1, 75) = 0.26$, $p = .61$, and no significant interaction effect, $F(1, 75) = 1.46$, $p = .23$.

We also predicted that subordinates of incompetent leaders would be more resistant to leader influence than subordinates of competent leaders (H3). Calculating the same ANOVA as before for resistance to leader influence as the dependent variable yielded a significant leaders' competence main effect with subordinates of incompetent leaders being more resistant to their leaders influence than subordinates of competent leaders (Table 1). There

was no significant gender main effect, $F(1, 75) = 1.05$, $p = .31$, and no significant interaction effect, $F(1, 75) = 0.01$, $p = .93$.

(Table 1 about here)

We examined whether perceived leader dominance mediates the relationship between leader competence and subordinate dominance behavior (H4). Figure 1 shows that the significant association between leader competence and subordinate dominance behavior became non-significant when controlling for perceived leader dominance (Baron & Kenny, 1986). Using the bootstrap framework (Shrout & Bolger, 2002) – recommended to be used instead of the Sobel test when sample sizes are small – showed that this decrease was significant, b = 0.24, 95% CI = -0.44, -0.08. Thus perceived leader dominance completely mediated the relation between leader competence and subordinate dominance behavior.

Also we tested whether perceived leader dominance mediates the relationship between leader competence and subordinate resistance to leader influence (H5). Figure 1 shows that the significant association between leader competence and subordinate resistance became non-significant when controlling for perceived leader dominance (Baron & Kenny, 1986). Bootstrapping (Shrout & Bolger, 2002) indicated that this decrease was significant, b = 3.51, 95% CI = 1.17, 6.55. We therefore confirmed that perceived leader dominance completely mediated the relation between leader competence and subordinate resistance.

(Figure 1 about here)

Finally, we expected participants of incompetent leaders to show more task involvement than subordinates of competent leaders (H6). We calculated a 2 (leaders' competence: competent vs. incompetent) by 2 (gender of the participant) ANOVA with task involvement as the dependent variable and we entered personality dominance again as a covariate. Contrary to our prediction, results for task involvement showed no significant leader competence main effect, $F(1, 75) = 0.24$, $p = .31$. There was also no significant gender

main effect, $F(1, 75) = 0.47$, $p = .47$, and no significant interaction effect, $F(1, 75) = 0.01$, $p = .95$.

Discussion

We predicted and found that an incompetent leader is perceived as less dominant than a competent one (H1), that subordinates of incompetent leaders behave more dominantly towards their leaders in an interaction (H2), and that subordinates of incompetent leaders are more resistant to leader influence (H3). Moreover, according to our hypotheses, perceived leader dominance mediated the relation between leader competence and subordinate dominance behavior (H4) and between leader competence and subordinate resistance to the leader (H5). Our results, however, do not confirm that subordinates who work together with incompetent leaders invest more in the task at hand.

Using an email exchange instead of a face-to-face interaction offered the opportunity to maximally standardize the leader, to the detriment of ecological validity with respect to the behavior observed. This is why we conducted Study 2 as a face-to-face interaction.

Also, our leader was described as a student, and most of the participants were students. According to the social identity perspective (e.g., Hogg, 2000; Turner, 1999), individuals classify and evaluate themselves and others in terms of the groups they belong to. It is therefore possible that in our setting, the status differences between the assigned leader and the assigned subordinate were attenuated. The student subordinate might have perceived the leader more in terms of his belonging to the category of students as opposed to being a leader and thus more similar to him-/herself. To add ecological validity to the power manipulation, we used older participants who were not students for Study 2.

Study 2

Interactions between leaders and subordinates usually take place in face-to-face interactions. In Study 2 participants interacted with a social interaction partner who was

either a competent or incompetent leader. We used an older, non-student leader as the interaction partner.

Method

Participants

Our sample consisted of 42 women and 38 men (M_{age} = 23, *SD* = 3.37, range: 18 – 33). The majority were university students in different domains (e.g., psychology, arts, law), 87 %, and some were employees in different areas (e.g., human resources, accounting), 13 %. As in Study 1, we excluded students in pharmacy and medicine. Participants who already participated in Study 1 were also excluded. Participants received a 2 CHF lottery ticket for their participation and the best dyad (explained in more detail later) had the opportunity to win one out of two 100 CHF prizes.

Procedure

The procedure was nearly identical to that in Study 1, except that participants interacted with a leader (one of 3 male confederates) in a face-to-face interaction. Participants were informed that there is a correct solution to the priority list of assembling a first aid kit and that the two dyads who will perform best will receive a 100 CHF price. Participants were all assigned the subordinate role and were informed that they had the opportunity to work with a man who is used to lead teams during decision-making processes. Additionally, the status difference between the participant and the confederate was underscored by the confederate sitting in a comfortable and big chair and by the participant sitting in a simple wooden chair, a power manipulation that has been used successfully in previous studies (Chen, Lee-Chai, & Bargh, 2001).

As in Study 1, participants interacted with either a task-competent or a task-incompetent leader. In the competent condition, participants were instructed that the leader has a pharmaceutical background, works in a pharmacy, and teaches in a professional school of

druggists. In the incompetent condition, participants were informed that the leader has an educational background and teaches in a school for mentally challenged children. The interaction was videotaped for later coding of dominance behavior of the participant.

After having filled in the personality dominance questionnaire, participants were asked to prioritize 8 items on a sheet of paper for the First Aid Kit. Note that we used only 8 items in Study 2 and not 12 as in Study 1 because we wanted the interactions not to last much more than 15 min and pretests showed that this was best accomplished with using only 8 items. The dyads were instructed to discuss and negotiate the best ranking of the 8 items within 15 min. The leader started the interaction by asking the participant how high he or she ranked the first item on the sheet (mosquito lotion) and they then discussed the ranking of that item. They proceeded to discuss each item down the list, one at a time. After the interaction, the participant was asked to submit his or her final ranking to the leader for evaluation.

Finally, participants filled in the same measures as in Study 1 with an additional two measures: they were asked to indicate how authentic they perceived the leader to be, and how task-competent they perceived themselves to be. Based on the videotaped exchange, uninvolved judges rated participant dominance behavior.

Problem-Solving Task

We used the same task as Study 1, except we reduced the list of 12 items to 8. The leader always presented this solution to the participant. As in Study 1, each item could reasonably be ranked higher or lower in priority. As an example, when the competent leader ranked the item higher than the participant, he said "I ranked the sunscreen lotion on the 4th position. When we travel in a South American country, it is essential to protect ourselves.… The best protection against the sun is sunscreen lotion." When the leaders ranked the item lower than the participant, he would say: "I ranked the sunscreen lotion on the 4th position.

When we travel in a South American country, it is essential to protect ourselves.… The best protection against the sun is: clothes, sunglasses, and a hat.

Confederate Training

Three confederates were trained and learned an adapted script of Study 1 before practicing the script with each other. They were all male actors and older than the participants (all between 35 and 50 years old). All three were trained to act as similarly as possible and their nonverbal behavior was carefully controlled. They were instructed to avoid nodding, smiling, back-channels such as "uh-huh" or "mmh-mmh", and excessive gesturing. Confederates maintained a natural and attentive eye contact.

They were trained to use specific expressions in line with the competence conditions. For instance, statements such as "as a pharmacist" or "according to the research on" or "scientific studies show" were used for the competent condition and "according to my own experience" or "I don't really have expertise on" were used for the incompetent condition.

Material

The following measures were the same as in Study 1: *personality dominance* (*M* = 0.50, *SD* = 0.19, Cronbach's alpha = .69), *perceived leader dominance* (*M* = 3.26, *SD* = 0.74, Cronbach's alpha = .60), and *subordinate resistance to leader influence* on the subordinate's final decision (*M* = 9.23, *SD* = 4.66, range: 2 – 22). Due to the low reliability of the *task involvement* measure in Study 1, we removed one item from the scale for Study 2 *(M* = 4.11, *SD* = 0.64, Cronbach's alpha = .73). In Study 2, we added a measure of *self-reported subordinate competence* with four items (2 reverse scored) on a 5-point Likert scale (1 = *do not at all agree*, 5 = *completely agree*). Sample items are: "I felt competent for the task" or "I was unable to do the task" (reverse scored). Scores were averaged *(M* = 3.58, *SD* = 0.84, Cronbach's alpha = .82).

Dominance behavior. Two raters watched the videotaped interactions and assessed participant *dominance behavior* on a 5-point Likert scale (1 = *not at all dominant*, 5 = *completely dominant*) (interrater reliability: mean *r* = .86). Raters were provided with the following description of dominance behavior during an interaction: A high dominance behavior during the interaction was clearly contradicting or interrupting the leader, or taking the lead of the discussion, whereas a low dominance behavior during the interaction was waiting for the leader's lead, expressing own opinions hesitantly (Schmid Mast & Hall, 2003). The ratings made by the two raters were averaged (*M* = 3.22, *SD* = 1.05) to obtain a final score named "third observer dominance ratings".

Manipulation check scales. *Leader liking, perceived task attractiveness, role liking,* and *perceived realism of the interaction* were assessed with the same items as in Study 1 (*M* = 4.28, *SD* = 0.65, Cronbach's alpha = .80; *M* = 3.87, *SD* = 0.73, Cronbach's alpha = .81; *M* = 3.79, *SD* = 0.56, Cronbach's alpha = .72; *M* = 3.07, *SD* = 0.94, Cronbach's alpha = .65; respectively). Compared to Study 1, we only used three of the original six items measuring *perceived leader competence* (*M* = 3.72, *SD* = 0.75, Cronbach's alpha = .75). Additionally, we measured *perceived leader authenticity* with the following two items: "I found that my leader was spontaneous" and "I found that my leader did not interact naturally" (reverse scored) on the same 5-point Likert scale as the other manipulation check measures (*M* = 3.49, *SD* = 1.04, Cronbach's alpha = .77).

Results

As in the previous study, our manipulations were successful. Competent leaders (*M* = 4.08) were perceived as more competent than incompetent ones (*M* = 3.41), *t*(78) = 4.41, *p* = .0001. Interacting with the competent or the incompetent leader did not affect the perceived realism of the interaction, *t*(78) = 0.006, *p* = .99, the perceived authenticity of the leader, *t*(78) = 0.17, *p* = .87, how much they liked the leader, *t*(78) = 0.004, *p* = .99, how attractive

they found the task, $t(78) = 1.27$, $p = .21$, and how much they liked their subordinate role, $t(78) = 1.21$, $p = .23$.

There was no significant difference in perceived competence of the 3 confederates, $F(2, 77) = 1.17$, $p = .32$, no difference in role liking, $F(2, 77) = 1.65$, $p = .20$, no difference in perceived realism of the interaction, $F(2, 77) = 2.31$, $p = .11$, and no difference in perceived task attractiveness, $F(2, 77) = 0.47$, $p = .63$, when interacting with the different confederates. However, there was a marginal significant difference in leader liking when interacting with the different confederates, $F(2, 77) = 2.73$, $p = .07$, showing that participants liked more Confederate 1 ($M = 4.46$) than Confederate 2 ($M = 4.09$) and Confederate 3 ($M = 4.18$). Moreover, there was a significant difference in perceived authenticity of the 3 confederates, $F(2, 77) = 4.35$, $p = .016$, showing that Confederate 1 was perceived as more authentic ($M = 3.83$) than Confederate 2 ($M = 3.02$) and Confederate 3 ($M = 3.36$). Due to the potential influence of the confederate on the results, we included confederate as a covariate in all the analyses.

To test our hypotheses, we calculated separate 2 (leaders' competence: competent vs. incompetent) by 2 (gender of the participant) ANOVAs for perceived leader dominance (H1), subordinate dominance behavior (H2), subordinate resistance to leader influence (H3), and task involvement (H6). Confederate and personality dominance were included as covariates in the analyses.

Results are shown in Table 1 and confirmed that incompetent leaders were perceived as less dominant than competent ones (H1), that subordinates of incompetent leaders behaved more dominantly in the interaction (H2) and that they were more resistant to leader influence than subordinates of competent leaders (H3) (Table 1). However, contrary to our prediction (H6) but similar to Study 1, there was no significant difference in task involvement between subordinates interacting with a competent or an incompetent leader.

With respect to the aforementioned variables, there were no significant gender main effects: perceived leader dominance, $F(1, 74) = 0.85$, $p = .36$, subordinate dominance behavior, $F(1, 74) = 0.55$, $p = .46$, and task involvement, $F(1, 74) = 0.43$, $p = .51$. However, contrary to Study 1, results yielded a significant gender main effect for subordinate resistance to leader influence, $F(1, 74) = 5.74$, $p = .019$, showing that female subordinates were more resistant to leader influence ($M = 8.20$) than males ($M = 10.60$) [4]. Comparable to Study 1, none of the interaction effects between leader competence and subordinate gender was significant, all $F(1, 74) < 0.83$, p's $> .37$.

To examine whether perceived leader dominance mediates the relation between leader competence and subordinate dominance behavior (H4) and between leader competence and subordinate resistance to leader influence (H5) we conducted the same analyses as in Study 1. Figure 2 shows that the relation between leader competence and subordinate dominance behavior became less pronounced but still marginally significant when controlling for perceived leader dominance (Baron & Kenny, 1986). The bootstrap procedure (Shrout & Bolger, 2002) showed that this decrease was significant, b = 0.14, 95% CI = -0.37, -0.005. Thus perceived leader dominance partially mediated the relationship between leader competence and subordinate dominance behavior.

Also we examined whether perceived leader dominance mediates the relationship between leader competence and subordinate resistance to leader influence (H5). Figure 2 shows that the relation between leader competence and subordinate resistance was only marginally significant and that the relation between perceived leader dominance and subordinate resistance was not significant. Therefore, the prerequisites for mediation were not met (Baron & Kenny, 1986).

(Figure 2 about here)

Discussion

The goal of Study 2 was to replicate the pattern of results obtained in Study 1 while remedying some of the limitations of Study 1. This is why participants engaged in a face-to-face interaction and why we used an older, non-student man as the leader. Study 2 confirmed our predictions and the results of Study 1: Subordinates interacting with a incompetent (as opposed to a competent) leader perceived the leader to be less dominant, behaved themselves in a more dominant way towards him, and showed more resistance to his influence (Table 1). As in Study 1 but contrary to our prediction, we did not find an effect of leader competence on task involvement.

General Discussion

The goal of this research was to investigate how a leader's lack of competence affects the perception of the leader by his or her subordinate and how the subordinate reacts to such a leader in terms of his or her own dominance behavior towards the leader, the degree to which he or she resists leader influence, and the level of task involvement. In two studies, the same results emerged which is noteworthy because we used a different methodological approach. In Study 1, the interaction was rather artificial in that it was staged as an email exchange whereas in Study 2, participants interacted face-to-face with a real person as their leader. The fact that the results converge adds to the generalizability of our findings.

Confirming the predictions made by EST, we found that differences in competence are interpreted by group members – or in our case the dyad member – as signs of status differences. Moreover, these status differences are responsible for how people act in social interactions. We showed that perceived leader dominance mediated the relation between leader competence and subordinate dominance behavior on the one hand and between leader competence and subordinate resistance to leader influence (at least in Study 1) on the other hand.

Our results also show that subordinates of incompetent leaders behaved more dominantly towards their leader and resisted their leader's influence more. These findings point to the importance of a congruence between status hierarchy and competence hierarchy. If there is incongruence, subordinates compensate for it by adapting their behavior, meaning that when together with an incompetent leader, the subordinate behaves more dominantly. Subordinates seem to automatically adjust their dominance behavior according to the perceived dominance of their leader as shown also during peer interactions in that interaction partners complement each other's dominance behavior (Tiedens & Fragale, 2003).

The fact that one behaves more dominantly than the subordinate role would prescribe might, however, entail problems in the long run. For instance, self-perception theory predicts that a person who behaves dominantly will also come to see him- or herself as more dominant and the person might wonder why he or she is not the one in the leadership position. This might result in power struggles and competitiveness within the superior-subordinate relationship and we expect this to be a rather stressful situation.

A leader's incompetence is a rather taboo theme. Although subordinates often mention a lack of expertise of their leader, empirical research addressing this question is scarce. One could argue that subordinates' complaints are exaggerated because many subordinates, given that they are in a situation of low power, are not in a position to assess their leaders' task-competence. However, our results show that subordinates perceived correctly an existing competence difference among leaders and thus confirmed previous empirical literature (e.g., Shipper & Wilson, 1991) suggesting that perceived leader competence is related with objective measures of competence (i.e., the profitability of a unit, the win-loss record of a team; Hogan, Curphy, & Hogan, 1994).

Contrary to prediction but confirmed in both of our studies, task involvement did not differ according to whether the subordinate interacted with a competent or incompetent

leader. Note that not finding the predicted relation between leader competence and task involvement in Study 1 was thus not due to the low reliability of the scale in Study 1 because we adapted the scale for Study 2 and it showed good reliability but there was still no effect. Maybe the fact that the subordinate had to submit the final ranking to the leader for evaluation can explain why there was no effect of leader competence on task involvement. Subordinates might have invested their maximum effort in both conditions because finally it was the leader - regardless of his competence level - who evaluated the subordinate's final list. Thus, the fact that the individual contribution could be evaluated might have increased the individual's task involvement in both conditions (e.g., Price, Harrison, & Gavin, 2006). Indeed, Table 1 shows that the means for the competent and the incompetent conditions were rather high. Another factor could be social desirability. Maybe participants just wanted to report that they took the task seriously and that they complied with the experiment and this is why they reported high levels of task involvement. Recall that it was a self-report measure.

In our studies, participant gender did mostly not affect the results. This finding is supported by the situational/authority approach (e.g., Johnson, 1994; Leffler, Gillespie, & Conaty, 1982; Zelditch & Walker, 1984) suggesting that formal authority is more important than gender in understanding conversation behaviors (e.g., powerless speech and dominance behaviors). Johnson (1994) examined conversations in authority relationships between formal leaders (male and female) and their subordinates (male and female) and found that positions in the hierarchy has the most robust effect on the conversation behaviors and not gender.

Note that in our study the leader was always a man because that reflects best the current state of affairs (Laessig et al., 2006). However, it would be interesting to see whether the results came out the same if participants interacted with a female leader. Because female leaders as compared to male leaders are evaluated more negatively and thus are perceived as

less competent (Eagly & Karau, 2002), maybe making the women competent would not have worked so well and the manipulation we used would have produced weaker results.

The question of whether task performance of the subordinate or the dyad is affected by leader incompetence remains open in our studies. There is evidence pointing towards reduced team performance when the leader is less competent than the subordinate (Justis et al., 1978; Sauer et al., 2008) and some studies found that subordinates perform worse when their leader is incompetent (Hamblin et al., 1961; Hogan, Raskin, & Fazzini, 1990). However, it is also possible that when together with an incompetent leader, the subordinate would not only take on more dominance and thus compensate for the lack of dominance of the leader (as we showed in the present research) but also be more successful in solving the task at hand. Future studies might want to include task performance measures to clarify this question.

The existing literature focuses on the importance of *interpersonal competence* for good leadership (McCall & Lombardo, 1983; Van Velsor & Leslie, 1995). For instance, based on interviewing senior executives from different organizations, revising qualitative studies, and conducting surveys, Lombardo and his colleagues (Lombardo et al., 1988; McCall & Lombardo, 1983; McCauley & Lombardo, 1990) concluded that incompetent managers had relationship problems, were incapable of building a team, and showed poor leadership. Thus, they were less interpersonally competent. As a consequence, today, many leadership trainings focus on interpersonal skills. The present research shows that a leader's task-competence is also an important factor which is in line with some authors' assertion that instrumental thus task-related aspects of leadership are equally important for effective leadership (e.g., Antonakis, 2006). Given that technical skills are certainly considered as the more trainable skills, organizations might profit from continuously updating their leader's technical abilities rather than their interpersonal skills.

The importance of the leader's interpersonal competence in comparison to his or her

task-competence remains poorly understood to date. More research is needed to address the interplay of task- and interpersonal competence of the leader for leadership outcomes. More specifically, studies systematically varying both aspects of competence independent from each other and then testing their joint or separate influence on leadership outcomes and interpersonal perception and behavior between superiors and subordinates are needed. It has to be noted that depending on the job and the leader's task at hand, the leader does not necessarily have to have the technical knowledge to be a good leader. To illustrate, the importance of interpersonal or task-competence is affected by the leader's hierarchical position within the organization (e.g., Boyatzis, 1982; Mumford, Marks, Connelly, Zacaro, & Reiter-Palmon, 2000). Task-competence seems more important than interpersonal competences at a low hierarchical level. With increasing complexity of the activities and relationships in an organization, different types of competences are needed (i.e., task and interpersonal) (Yulk, 2006) and leader training should therefore definitely not neglect aspects of technical competence.

Our research included data collection in a laboratory setting with participants allocated to low power roles. Whether participants who actually are in a hierarchical relationship with a leader perceive their leader's level of competence in the same way as our participants and whether they react in the same manner to a competent or incompetent boss remains to be tested. Leader perception might differ in long-term relationships.

Also, our research shows that "leadership cannot be studied apart from followership" (Van Vugt, Hogan, & Kaiser, 2008, p. 193). The way the leader is perceived affects the subordinate and vice versa. In emergent leadership situations, the group members often appoint the leadership position to the person they perceive as the most competent to solve the task at hand (Berger et al., 1977; Ridgeway & Berger, 1986). The leader thus possesses legitimate power. As soon as the group detects a lack of competence in the leader, he or she is

in an illegitimate situation and the group will replace the leader with another person. In organizations, it is very rare that a group gets to choose or appoint their leader, often the human resource department or the next higher instance chooses a leader for the group. When the group judges the leader as incompetent, the leader cannot so easily be replaced and the situation of having an illegitimate leader lasts. This is not only a problematic situation for the subordinates who do not have the power to replace their leader but most likely also for the leader who might suffer from non-acceptance or non-respect of his or her subordinates. An illegitimate leader might thus be linked to costs related to reduced work satisfaction, increased health complaints, absenteeism, and higher turnover.

References

Antonakis, J. (2006). Leadership: What is it and how it is implicated in strategic change? *International Journal of Management Cases, 8*, 4-20.

Assor, A., Aronoff, J., & Messe, L. A. (1981). Attribute relevance as a moderator of the effects of motivation on impression formation. *Journal of Personality and Social Psychology, 41*, 789-796.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.

Bass, B. M. (1990). *Bass and Stogdill's handbook of leadership: Theory, research, and managerial applications* (3rd ed). New York: Free Press.

Berger, J., Fisek, M. H., Norman, R. Z., & Zelditch, M., Jr. (1977). *Status characteristics in social interaction: An expectation states approach*. New York: Elsevier.

Berger, J., Webster, M., Ridgeway, C., & Rosenholtz, S. J. (1986). Status cues, expectations, and behavior. In E. Lawler (Ed*.). Advances in group processes: Theory and research* (Vol. 3, pp. 1-22). Greenwich, CT: JAI Press.

Boyatzis, R. E. (1982). *The competent manager: A model for effective performance.* New York: John Wiley & Sons.

Chen, S., Lee-Chai, A. Y., & Bargh, J. A. (2001). Relationship orientation as a moderator of the effects of social power. *Journal of Personality and Social Psychology, 80,* 173-187.

Collins, L. (1996). Is reliability obsolete? A commentary on "Are simple gain scores obsolete?". *Applied Psychological Measurement, 20*, 289-292.

Cronbach, L. J., & Furby, L. (1970). How should we measure change – or should we? *Psychological Bulletin, 74*, 68-80.

DePaulo, B. M., & Friedman, H. S. (1998). Nonverbal communication. In D. Gilbert, S.

Fiske, & G. Lindzey (Eds.) *Handbook of Social Psychology* (4th ed., Vol. 2, pp. 3-40). New York: McGraw-Hill.

Eagly, A. H. (1978). Sex differences in influenceability. *Psychological Bulletin, 85*, 86-116.

Eagly, A. H., & Carli, L. L. (1981). Sex of researchers and sex-typed communications as determinants of sex differences in influenceability: A meta-analysis of social influence studies. *Psychological Bulletin, 90*, 1-20.

Eagly, A. H., & Karau, S. J. (2002). Role congruity theory of prejudice toward female leaders. *Psychological Review, 109*, 573-598.

Ellyson, S. L., & Dovidio, J. F. (1985). Power, dominance, and nonverbal behavior: Basic concepts and issues. In S. L. Ellyson & J. F. Dovidio (Eds.), *Power, dominance, and nonverbal behavior* (pp. 1-27). New York: Springer.

Fragale, A. R. (2006). The power of powerless speech: The effects of speech style and task interdependence on status conferral. *Organizational Behavior and Human Decision Processes, 101,* 243-261.

Gough, H. G. (1975). *Manual for the California Psychological Inventory*. Palo Alto: Consulting Psychologists Press.

Halberstadt, A. G., & Saitta, M. B. (1987). Gender, nonverbal behavior, and perceived dominance: A test of the theory. *Journal of Personality and Social Psychology, 53*, 257-272.

Hall, J. A., Coats, E. J., & Smith LeBeau, L. (2005). Nonverbal behavior and the vertical dimension of social relations: A meta-analysis. *Psychological Bulletin, 131*, 898-924.

Hamblin, R. L., Miller, K., & Wiggins, J. A. (1961). Group morale and competence of the leader. *Sociometry, 24,* 295-311.

Hogan, R. (2007). *Personality and the fate of organizations.* Hillsdale, NJ: Erlbaum.

Hogan, R., Curphy, G. J., & Hogan, J. (1994). What we know about leadership: Effectiveness

and personality. *American Psychologist, 49,* 493-504.

Hogan, R., Raskin, R., & Fazzini, D. (1990). The dark side of charisma. In K. E. Clark & M. B. Clark (Eds.), *Measures of leadership* (pp. 343-54). West Orange, NJ: Leadership Library of America.

Hogg, M. A. (2000). Subjective uncertainty reduction through self-categorization: A motivational theory of social identity processes. *European Review of Social Psychology, 11*, 223-255.

Hollander, E. P. (1985). Leadership and power. In G. Lindzey & E. Aronson (eds.), *The handbook of social psychology* (pp. 485-537). New York: Random House.

House, J. S. (1981). *Work stress and social support.* Reading, MA: Addison Wesley.

Jackson, D. N. (1984). *Manual for the Personality Research Form* (3rd edition). Goshen: Research Psychologists Press.

Johnson, C. (1994). Gender, legitimate authority, and leader-subordinate conversations. *American Sociological Review, 59,* 122-135.

Justis, R. T., Kedia, B. L, & Stephens, D. B. (1978). The effect of position power and perceived task competence on trainer effectiveness: A partial utilization of fielder's contingency model of leadership. *Personnel Psychology, 31,* 83-93.

Kerr, N. L. (1983). Motivation losses in small groups: A social dilemma analysis. *Journal of Personality & Social Psychology, 45,* 819-828.

Laessig, V., Moresi, E., Siegenthaler, S., & Vuille, A. (2006). *ESPA 2006 en bref : Principaux résultats de l'enquête suisse sur la population active.* Office fédéral de la statistique.

Lammers, J., Galinsky, A. D., Gordijn, E. H., & Otten, S. (2008). Illegitimacy moderates the effects of power on approach. *Psychological Science, 19,* 558-564.

Leffler, A., Gillespie, D., & Conaty, J. (1982). The effects of status differentiation on

nonverbal behavior. *Social Psychology Quarterly, 45*, 153-161.

Linkey, H. E., & Firestone, I. J. (1990). Dyad dominance, composition effects, nonverbal behaviors, and influence. *Journal of Research in Personality, 24*, 206-215.

Lombardo, M. M., Ruderman, M. N., & McCauley, C. D. (1988). Explanations of success and derailment in upper-level management positions. *Journal of Business and Psychology, 2*, 199-216.

McCall, M. W., Jr., & Lombardo, M. M. (1983). *Off the track: Why and how successful executives get derailed*. Technical Report No. 21. Greensboro, NC: Center for Creative Leadership.

McCauley, C. D., & Lombardo, M. M. (1990). Benchmarks: An instrument for diagnosing managerial strengths and weaknesses. In K. E. Clark & M. B. Clark (Eds.), *Measures of leadership* (pp. 535-545). Greensboro, NC: Center for Creative Leadership.

McFadyen, R. G. (1997). The relationship between powerless speech, agentic behavior, and amount of talk. *Journal of Social Psychology, 137*, 470-479.

Moon, Y. (1999). The effects of physical distance and response latency on persuasion in computer-mediated communication and human-computer communication. *Journal of Experimental Psychology: Applied, 5*, 379-392.

Mumford, M. D., Marks, M. A., Zaccaro, S. J., Connelly, M. S., & Reiter-Palmon, R. (2000). Development of leadership skills: Experience, timing, and growth. *Leadership Quarterly, 11*, 87-114.

Nicholls, J. (1983). Conceptions of ability and achievement motivation: A theory and its implications for education. In S. G. Paris, G. M. Obson, & H. W. Stevenson (Eds), *Learning and motivation in the classroom* (pp. 211-237). Hillsdale, NJ: Lawrence Erlbaum Associates.

O'Barr, W. M., & Atkins, B. K. (1980). "Women's language" or "powerless language"? In S. McConell-Ginet, R. Borker, & N. Furman (Eds.), *Women and language in literature and society* (pp. 93-110). New York: Praeger.

Operario, D., & Fiske, S. T (2001). Effects of trait dominance on powerholders' judgments of subordinates. *Social Cognition, 19*, 161-180.

Orpen, C. (1995). The effects of exchange ideology on the relationship between perceived organizational support and job performance. *Journal of Social Psychology, 134*, 407-408.

Price, K. H., Harrison, D. A., & Gavin, J. H. (2006). Withholding inputs in team contexts: Member composition, interaction processes, evaluation structure, and social loafing. *Journal of Applied Psychology, 91*, 1375-1384.

Ridgeway, C. L., & Berger, J. (1986). Expectations, legitimation, and dominance behavior in task groups. *American Sociological Review, 51*, 603- 617.

Ridgeway, C., & Diekema, D. (1989). Dominance and collective hierarchy formation in male and female task groups. *American Sociological Review, 54*, 79-93.

Sauer, J., Darioly, A., Schmid Mast, M., Schmid, P. C., & Bischof, N. (2009). *The effects of crew resource management training on team performance as a function of matching or mismatching competence and hierarchical status.* Manuscript submitted for publication.

Schmid Mast, M. (2002). Dominance as expressed and inferred through speaking time: A meta-analysis. *Human Communication Research, 28*, 420-450.

Schmid Mast, M., & Hall, J. A. (2003). Anybody can be a boss but only certain people make good subordinates: Behavioral impacts of striving for dominance and dominance aversion. *Journal of Personality, 71*, 871-891.

Schmid Mast, M., Jonas K., & Hall, J. A. (in press). Give a person power and he or she will show interpersonal sensitivity. The phenomenon and its why and when. *Journal of*

Personality and Social Psychology.

Shechtman, N. (2002). *Talking to people versus talking to computers: Interpersonal goals as a distinguishing factor.* Unpublished doctoral dissertation, Stanford University, Stansford, CA.

Shipper, F., & Wilson, C. L. (1991, July). *The impact of managerial behaviors on group performance, stress, and commitment.* Paper presented at the Impact of Leadership Conference, Center for Creative Leadership, Colorado Springs, CO.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7,* 422-445.

Tepper, B. J. (2000). Consequences of abusive supervision. *Academy of Management Journal, 43,* 178-190.

Tiedens, L. Z., & Fragale, A. R. (2003). Power moves: Complementarity in submissive and dominant nonverbal behavior. *Journal of Personality and Social Psychology, 84,* 558-568.

Tsui, A. S. (1984). A role set analysis of managerial reputation. *Organizational Behavior and Human Performance, 34,* 64-96.

Turner, J. C. (1999). Some current issues in research on social identity and self-categorization theories. In N. Ellemers, R. Spears, & B. Doosje (Eds.), *Social Identity* (pp. 6-34). Oxford, UK: Blackwell.

Tusing, K. J., & Dillard, J. P. (2000). The sounds of dominance: Vocal precursors of perceived dominance during interpersonal influence. *Human Communication Research, 26,* 148-171.

Van Velsor, E., & Leslie, J. (1995). Why executives derail: perspectives across time and culture. *Academy of Management Executive, 9,* 62-72.

Van Vugt, M., Hogan, R., & Kaiser, R. B. (2008). Leadership, followership, and evolution:

Some lessons from the past. *American Psychologist, 63,* 182-196.

Weinstein, B. (2007, February). Help! My boss is incompetent. *Tampa Bay Online,* Special sections correspondent. Retrieved April 27, 2009, from http://www.tbo.com/careerseeker/MGBIXXR4DYE.html.

Wehr, P., Burgess, H., & Burgess, G. M. (Eds.) (1994). *Justice without violence*. Boulder and London: Lynne Rienner Publishers.

Wiggins, J. S., & Broughton, R. (1985). The interpersonal circle: A structural model for the integration of personality research. In R. Hogan & W. H. Jones (Eds.), *Perspectives in personality* (Vol. 1, pp. 1-47). Greenwich, CT: JAI Press.

Wiggins, J. S., Phillips, N., & Trapnell, P. (1989). Circular reasoning about interpersonal behavior: Evidence concerning some untested assumptions underlying diagnostic classification. *Journal of Personality and Social Psychology, 56,* 296-305.

Williams, K. D., & Karau, S. J. (1991). Social loafing and social compensation: The effects of expectations of co-worker performance. *Journal of Personality and Social Psychology, 61,* 570-581.

Yukl, G. A. (2006). *Leadership in Organizations*. Upper Saddle River, NJ: Prentice-Hall.

Zelditch, M., Jr., & Walker, H. A. (1984). Legitimacy and the stability of authority. In J. Berger & M. Zelditch, Jr. (Eds.), *Status, power, and legitimacy: Strategies & theories* (ch. 15). New Brunswick, NJ: Transaction.

Footnotes

[1] This web-based computer program was adapted from Shechtman (2002).

[2] Because the results of expression of dominance and powerless speech showed exactly the same thing when calculating them separately for each variable, we opted for combining them (since they were significantly correlated) in order not to "double" one and the same result and also in the interest of space.

[3] Initial gap was always 48 because the computer calculated the difference between the 2 rankings to be stable as explained in more detail in the Method section).

[4]Contrary to Study 1, we found that female subordinates were more resistant to their leader influence than males whatever the level of leader competence. This finding is not supported by previous studies (e.g., Eagly, 1978; Eagly & Carli, 1981) showing that women are often more easily influenced than men. Because gender effects are not the focus of our research, we do not discuss this result further.

Table 1

Main Effects of Leader Competence

	Study 1			Study 2		
	Competent	Incompetent		Competent	Incompetent	
	M	*M*	*F*	*M*	*M*	*F*
Perceived leader dominance (H1)	3.44	2.66	15.55**	3.46	3.10	5.01*
Dominance behavior (H2)	-0.28[a]	0.25	7.85**	2.90	3.52	6.98*
Resistance to leader influence (H3)	21.35	15.40	8.09**	10.56	8.24	5.77*
Task involvement (H6)	4.36	4.41	0.24	4.10	4.11	.005

Note. Study 1's *df* = 1, 75; Study 2's *df* = 1, 74, all *p*'s are one-tailed; note that for resistance to leader influence [a] Note that this is a composite variable, generated from two variables that were *z*-scored (range: -3.45 to 1.80).

** $p < .005$; * $p < .05$

Figure Captions

Figure 1. Complete mediations of perceived leader dominance on the relation between leader competence and subordinate dominance behavior and between leader competence and subordinate resistance to the leader in Study 1. *Note.* ** $p < .005$; * $p < .05$.

Figure 2. Partial and none mediations of perceived leader dominance on the relation between leader competence and subordinate dominance behavior and between leader competence and subordinate resistance to the leader in Study 2. *Note.* ** $p < .005$; * $p < .05$; † $p < .10$.

Figure 1

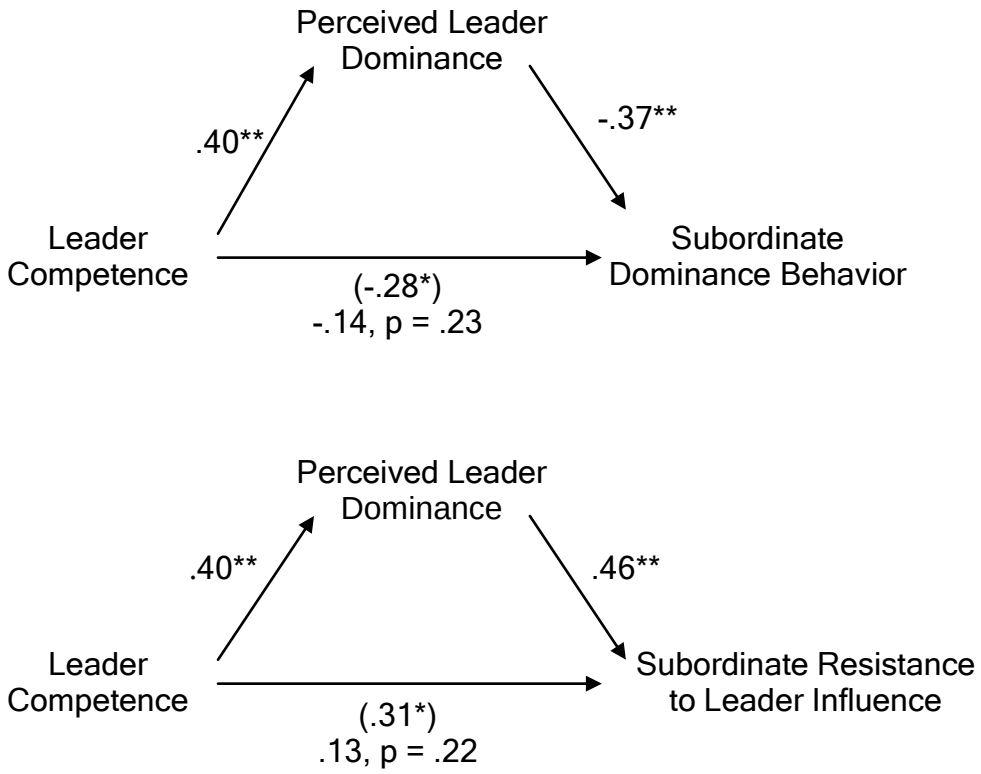
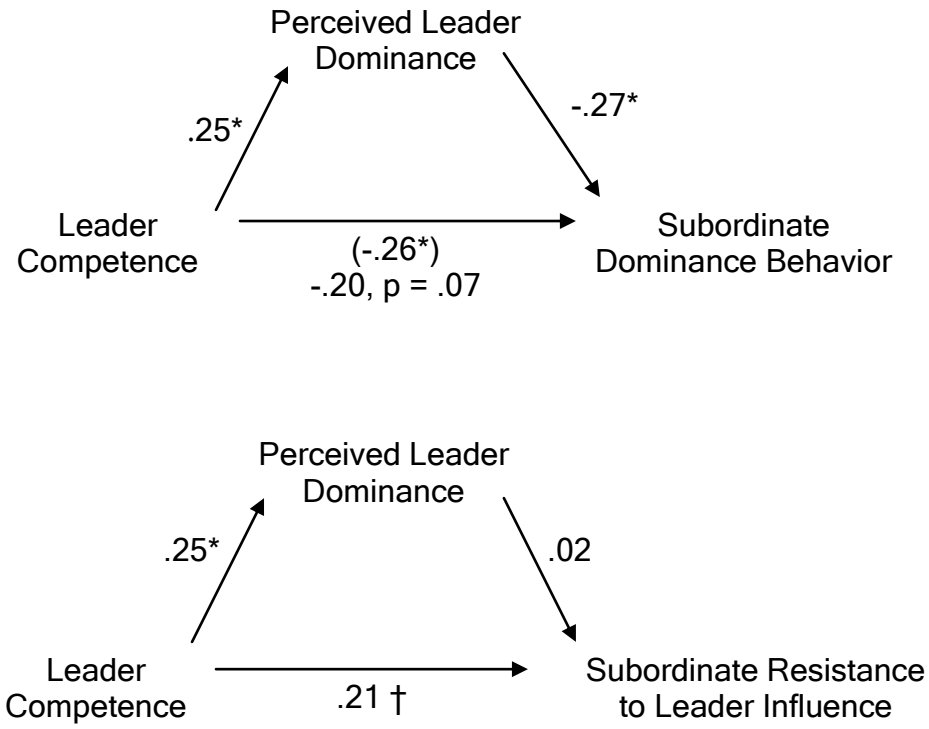

Perceived Leader Dominance
.40**
-.37**
Leader Competence
Subordinate Dominance Behavior
(-.28*)
-.14, p = .23
Perceived Leader Dominance
.40**
.46**
Leader Competence
Subordinate Resistance to Leader Influence
(.31*)
.13, p = .22

Figure 2


Perceived Leader Dominance
.25*
-.27*
Leader Competence
(-.26*)
-.20, p = .07
Subordinate Dominance Behavior
Perceived Leader Dominance
.25*
.02
Leader Competence
.21 †
Subordinate Resistance to Leader Influence

ARTICLE 2

Schmid Mast, M., Jonas, K., Klöckner Cronauer, C., & Darioly, A. (in press). On the importance of the superior's interpersonal sensitivity for good leadership. *Journal of Applied Social Psychology.*

This is the accepted version of the article whose definitive form will be published in the Journal of Applied Social Psychology.

On the Importance of the Superior's Interpersonal Sensitivity for Good Leadership

Marianne Schmid Mast

University of Neuchatel

Klaus Jonas

University of Zurich

Christina Kloeckner Cronauer

University of Neuchatel

Annick Darioly

University of Neuchatel

Address correspondence to: Prof. Dr. Marianne Schmid Mast, University of Neuchatel, Department of Work and Organizational Psychology, Rue de la Maladiere 23, CH-2000 Neuchatel, Switzerland, phone: +41-32-718-1394, fax: +41-32-718-1391 email: marianne.schmid@unine.ch

Abstract

This research is aimed at showing that interpersonal sensitivity (being attuned to and correctly inferring another person's thoughts and feelings) is an important aspect of what people expect from a good leader and that interpersonally sensitive leaders have more satisfied subordinates. In Study 1, 141 participants indicated how much they expected a good superior to be interpersonally sensitive (among other characteristics). People expect leaders to be interpersonally sensitive more so than subordinates. In Study 2, 76 participants interacted in same-gender dyads as leaders and subordinates. We measured subordinate satisfaction and leader interpersonal sensitivity. More interpersonally sensitive leaders had more satisfied subordinates. Interpersonal sensitivity is important for good leadership: it is expected from leaders and contributes to increased subordinate satisfaction.

Keywords: good leadership, subordinate satisfaction, empathy, interpersonal sensitivity

On the Importance of the Superior's Interpersonal Sensitivity for Good Leadership

The question of what constitutes good leadership has been asked again and again. Depending on the century, the authors involved, and the variables measured, responses have been quite different (McCauley, 2004). In the last decade or so, the way the leader relates to other people and in particular to his or her subordinates has been suggested as an important factor for good leadership. We call superiors who perceive their subordinates as unique individuals and who show an interest in them as a person (e.g., what they think and how they feel), interpersonally sensitive leaders. In the present article, we investigate whether such an attunement of the superior to the subordinate is something people expect from a good leader (Study 1) and whether a superior who is particularly skilled in assessing the subordinate's thoughts and feelings is a good leader in terms of having satisfied subordinates (Study 2).

Interpersonal Sensitivity

Interpersonal sensitivity or accuracy is the ability to correctly assess another's states and traits (Hall & Bernieri, 2001; Schmid Mast, Murphy, & Hall, 2006). Hall, Andrzejewski, and Yopchick (2009) distinguish between *attentional accuracy* – paying attention to the social interaction partner's cues (i.e., remembering others' verbal, nonverbal, and appearance cues) – and *inferential accuracy* – the correct interpretation of the perceived cues. This distinction corresponds to *detection* and *utilization* in the Realistic Accuracy Model of personality described by Funder (1995). Attentional accuracy has been operationalized by accurate recall of others' verbal messages (Overbeck & Park, 2001) or of others' nonverbal cues (Hall, Murphy, & Schmid Mast, 2006) and of others' appearance (Horgan, Schmid Mast, Hall, & Carter, 2004; Schmid Mast & Hall, 2006). Research on inferential accuracy has shown that people are able to correctly infer other people's emotions (Ickes, 1997, 2003; Matsumoto et al., 2000), motives (Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979), and thoughts (Ickes, 1997, 2003), others' personality traits (Ambady, Hallahan, & Rosenthal, 1995; Ambady,

LaPlante, & Johnson, 2001; Borkenau & Liebler, 1992; Funder, 1995, 1999; Murphy, Hall, & Colvin, 2003), and the type of interpersonal relationship two or more persons are involved in (Barnes & Sternberg, 1989; Bernieri, Davis, Rosenthal, & Knee, 1994; Schmid Mast & Hall, 2004).

As in the Realistic Accuracy Model of personality (Funder, 1995), the attentional part of interpersonal sensitivity is a precursor to being able to draw accurate inferences. In the present research we use interpersonal sensitivity in a broad sense and we include both a measure of attentional accuracy (Study 1) and a measure of inferential accuracy (Study 2), both described in more detail in the respective Method sections. Thus, we define interpersonal sensitivity as being attuned to and correctly inferring another person's states and traits.

Constructs Related to Interpersonal Sensitivity

To date, the relation of interpersonal sensitivity to other similar concepts such as emotional intelligence, social skills, and empathy is far from clear. To illustrate, there is some overlap between interpersonal sensitivity and emotional intelligence. Emotion recognition is a part of interpersonal sensitivity although interpersonal sensitivity encompasses more than just emotions. Likewise, emotion recognition is part of emotional intelligence. One aspect of emotional intelligence is *perceiving emotions* comprised of being attuned to others' emotions and understanding others' emotions. As a matter of fact, an emotion recognition task is part of the MSCEIT (Mayer, Caruso, & Salovey, 2000), the emotional intelligence measure most widely used.

Interpersonal sensitivity is also related to social skills. A socially skilled individual possesses verbal and nonverbal social competence understood as interpersonal and emotional expressivity, sensitivity, and control (Riggio, Tucker, & Coffaro, 1989). Note that social skills is a broader concept than interpersonal sensitivity in that it includes also the expression and the control part of interpersonal communication.

Researchers agree that empathy is a multifaceted construct composed of cognitive and emotional aspects (Davis, Hull, Young, & Warren, 1987; Lawrence, Shaw, Baker, Baron-Cohen, & David, 2004). Cognitive empathy refers to taking the perspective of the other whereas emotional empathy is the emotional reactivity to another person's situation. Interpersonal sensitivity also encompasses the cognitive and emotional aspects of one's attunement to another person. However, interpersonal sensitivity is broader than empathy. The social perception of the other is not limited to the other person's thoughts and feelings but includes an interest and judgment accuracy in assessing other's personality traits and their role in social interactions or relationships as described above.

Meta-analyses show that women are in general more interpersonally sensitive than men (Hall, 1984; McClure, 2000). When investigating how interpersonal sensitivity relates to other variables, it is therefore important to control for gender.

Interpersonal Sensitivity and Leadership Outcomes

Emotional intelligence, social skills, and empathy are all considered important aspects of leadership (George, 2000; Kellett, Humphrey & Sleeth, 2002; Mayer, Salovey, & Caruso, 2004; Palmer, Walls, Burgess, & Stough, 2001; Wolff, Pescosolido, & Druskat, 2002; Riggio, Riggio, Salinas, & Cole, 2003). Along the same lines, it has been shown that empathy is a prerequisite for leadership emergence (Wolff et al., 2002). Moreover, for Katz (1986), a leader with interpersonal skills is able to be aware of the perspective of others, is sensitive to the motives and needs of others, and takes them into account for decision making. In the same vein, Mumford, Zaccaro, Harding, Owen Jacobs, and Fleischman, (2000) postulate that the high performing and effective leader needs three competencies: problem-solving skills, social judgment skills, and knowledge. In their model, social judgment skills are composed of perspective taking, social perceptiveness, behavioral flexibility, and social performance. Perspective taking enables the leader to understand the other's point of view on a given issue,

to be sensitive to his or her goals and needs in specific situations (Zaccaro, Gilbert, Thor, & Mumford, 1991). Social perceptiveness is having insight and awareness into how others function and what is important to them (Zaccaro et al., 1991).

The importance of interpersonal sensitivity for good leadership is also documented in the more recent transformational leadership approach which emphasizes the importance for the leader to be sensitive to the followers' needs and motives (Burns, 1978). In Bass's work (1985) on transformational leadership, one factor is *individual consideration* which is understood as an attunement to the followers' individual needs. This factor showed positive relations with leader effectiveness (subordinate satisfaction and performance) in different studies (Lowe, Kroeck, & Sivasubramaniam, 1996).

Byron (2008) found in a vignette study that employees were more satisfied with female (but not with male) managers when they attended to the emotions of their subordinates than when not. Moreover, when investigating real managers and their subordinates, female (but not male) superiors who were more accurate in reading nonverbal emotional expressions of others had more satisfied subordinates (Byron, 2007). These studies show that gender might be an important moderator or a confound of the link between interpersonal sensitivity and leadership outcomes. This is why we included gender in both of our studies.

What is Good Leadership?

All of the above mentioned studies used different leadership outcome measures. Good leadership can indeed be defined in many different ways such as, for instance, goal achievement, subordinate satisfaction, team performance, organizational outcomes, or – most often – assessment of leadership effectiveness by peers, superiors, and/or subordinates (Kaiser, Hogan, & Craig, 2008). In addition, emergent leadership can be seen as an outcome of good leadership behavior. Group members most likely appoint leadership to the person with whom they are most satisfied in terms of performance or behavior. Although there is no

widely accepted definition of good leadership, important decisions are based on judgments of good leadership such as how to compensate good leadership with bonuses and salary increases, whether a leader needs to be replaced, whether a leader qualifies for a specific training, or whether he or she is required to develop specific leadership competencies (McCauley, 2004).

In the present research, we focus on one specific aspect of good leadership, subordinate satisfaction. Subordinate satisfaction is relatively easy to assess and has shown to be related to job performance. Judge, Thoresen, Bono, and Patton (2001) report in their meta-analysis a relation of r = .30 between job satisfaction and job performance. Harter, Schmidt, and Hayes (2002) report in their meta-analytic review that satisfaction of employees means satisfaction with their supervisor. They showed that subordinate satisfaction correlates with a composite index of performance including turnover, customer loyalty, and financial performance. Subordinate satisfaction is not only related to better job performance (Judge et al., 2001) but constitutes an important factor for employee health and well-being (Faragher, Cass, & Cooper, 2005) resulting in less absenteeism and lowered health costs.

Expectations about a Good Leader

In the present research we not only assess how differences in interpersonal sensitivity of the superior relate to differences in subordinate satisfaction (Study 2), we also ask whether interpersonal sensitivity is important for good leadership in the minds of people (Study 1). Implicit leadership theory posits that people harbor expectations about what characterizes a leader, usually based on a leader prototype (Nye & Forsyth, 1991). Moreover, under an implicit leadership theory perspective, the evaluation of a leader depends on whether he or she fulfills these expectations. To date, interpersonal sensitivity did not emerge as an important characteristic of a prototypical leader, maybe because the leader prototype does not necessarily describe a "good" leader. We were interested in what people expect from a *good*

leader. If interpersonal sensitivity is an aspect expected from good leaders and if it increases collaborator satisfaction this would be strong evidence hinting to the importance of interpersonal sensitivity training for leaders. There is evidence that interpersonal sensitivity can be improved by training (Costanzo, 1992).

Study 1

When people work together in a hierarchical relationship, most likely the expectations they harbor vis-à-vis the higher power person differ from the ones harbored vis-à-vis the lower power person. Although there is research investigating how leaders are perceived and what people expect their prototypical behavior to be (Kenney, Blascovich, & Shaver, 1994; Kenney, Schwartz-Kenney, & Blascovich, 1996; Lord, Brown, Harvey, & Hall, 2001) the question as to whether these expectations include interpersonal sensitivity has not yet been explored. Moreover, it remains unclear whether the prototypical behavior expected from a leader would describe a good or a bad leader. In the present research, we are interested in aspects of good leadership.

Research shows that high power people are more interpersonally sensitive than low power people (Hall & Halberstadt, 1994; Overbeck & Park, 2001; Schmid Mast, Jonas, & Hall, 2009). Whether high power people are also *expected* to be more interpersonally sensitive than their subordinates are, is a question that has not yet been addressed.

We tested whether people's implicit theories about a good leader and a good subordinate differed not only with respect to interpersonal sensitivity but also with respect to characteristics such as work investment, loyalty, innovation, interpersonal sensitivity, active criticism, and acceptance of criticism. We chose work investment, loyalty, and innovation because on the one hand, they have been identified as important aspects for prototypical leaders (Kenney et al., 1994; Kenney et al., 1996; Lord et al., 2001). On the other hand, we thought that these aspects might also describe subordinates. Moreover, these characteristics

have all been shown to be linked to overall team and organizational behavior and performance. For instance, job investment has been shown to be positively related to work satisfaction (Brown, 1996) and to be positively, though indirectly, linked to performance (Brown & Leigh, 1996). Loyalty or integrity also shows positive correlations with job performance (Ones & Viswesvaran, 1998). We added active criticism and acceptance of criticism because they are important aspects of performance feedback and concern both superiors and subordinates in a 360 degree feedback situation.

If we can show that interpersonal sensitivity is a characteristic that is expected from good leaders more so than it is expected from good subordinates, this hints to the importance of interpersonal sensitivity for good leadership. We can then go on and investigate whether differences in interpersonal sensitivity of a leader are related to different outcomes, such as subordinate satisfaction.

Method

Participants

Participants were a convenience sample of 70 women and 71 men (M_{age} = 29, *SD* = 9.25, range: 18 – 58) recruited by 10 psychology students on and near the campus. No specific recruitment criteria applied except that the person had to be 18 years of age and willing to fill in the questionnaire. There was no monetary or other compensation for participating. Participants' education differed: 66% with a college degree, 11 % with a higher vocational training, 16% with a basic vocational training, and 7 % other.

Procedure

Participants were asked to fill in a questionnaire measuring to what extent they agree that specific qualities are desired from either a good superior or a good subordinate (random assignment to either condition). Seventy-one participants (34 females, 37 males) completed the questionnaire on what characterizes a good superior and 70 participants (36 females, 34

males) completed the questionnaire on what characterizes a good subordinate. Both questionnaires contained the same questions except that they were formulated to refer to a superior or to a subordinate respectively. Participants also indicated their age and educational level and rated on one item how much experience they themselves had as a leader ("own experience as superior", scale from 1 (*not much*) to 5 (*very much*), $M = 2.65$, $SD = 1.17$) and on another item how much experience they had as a subordinate or assistant ("own experience as subordinate", scale from 1 (*not much*) to 5 (*very much*), $M = 3.66$, $SD = 1.10$). Note that their own experience as superior and as subordinate were both assessed in each version of the questionnaire.

Measures

The questionnaires assessing the characteristics of a good superior or a good subordinate respectively were developed by the researchers and measured 6 characteristics: work investment, loyalty, innovation, interpersonal sensitivity, active criticism, and acceptance of criticism. Participants indicated on a scale of 1 (*do not agree at all*) to 5 (*agree very much*) how much they agree with statements phrased in the following manner: "According to you, an ideal superior (subordinate) is a person who …".

Work investment. Participants indicated how much they agreed to statements indicating that a good superior (or a good subordinate) should be committed to his or her work and should invest as much as possible. Sample items are: "According to you, an ideal superior (subordinate) is a person who feels responsible for the quality of his or her work" or "…who invests him- or herself into work 200%". Work investment was measured with 6 items and showed good reliability (Cronbach's alpha = .78). Items were averaged and higher values indicate more work investment.

Loyalty. Participants indicated how much they agreed with statements positing that a good superior (or a good subordinate) should be loyal and trust others. Sample items are:

"According to you, an ideal superior (subordinate) is a person who is loyal towards the people he or she works with" or "…who trusts the people he or she works with". Loyalty was measured with 4 items and showed good reliability (Cronbach's alpha = .76). Items were averaged and higher values indicate more loyalty.

Innovation. How much participants agreed with statements indicating that a good superior (or a good subordinate) should be innovative was assessed with 4 items showing good reliability (Cronbach's alpha = .83). Sample items are: "According to you, an ideal superior (subordinate) is a person who takes initiative" or "…who is open towards new ideas". Items were averaged and higher values indicate more innovation.

Interpersonal sensitivity. Participants indicated how much they agreed with statements saying that a good superior (or a good subordinate) should care about others and be interested in others and their specific personality characteristics. Note that we focus on the attentional part of interpersonal sensitivity. Sample items are: "According to you, an ideal superior (subordinate) is a person who takes an interest in others as individuals" or "…who is sensitive to personality differences among co-workers". Interpersonal sensitivity was measured with 5 items and showed good reliability (Cronbach's alpha = .72). Items were averaged and higher values indicate more interpersonal sensitivity.

Active criticism. How much participants agreed with statements positing that a good superior (or a good subordinate) should actively criticize his or her subordinate (superior) was assessed with 3 items showing satisfactory reliability (Cronbach's alpha = .68). Sample items are: "According to you, an ideal superior (subordinate) is a person who does not hesitate to contradict his or her subordinate (superior)" or "…who asks critical questions if necessary". Items were averaged and higher values indicate more active criticism.

Acceptance of criticism. How much participants agreed with statements indicating that a good superior (or a good subordinate) should accept criticism from his or her subordinate

(superior) was assessed with 3 items showing good reliability (Cronbach's alpha = .78). Sample items are: "According to you, an ideal superior (subordinate) is a person who accepts criticism from his or her subordinate (superior)" or "…who is ready to improve if criticized by his or her subordinate (superior)". Items were averaged and higher values indicate more acceptance of criticism.

Results

To test whether participants had similar or different expectations concerning a good superior and a good subordinate on the 6 characteristics of work investment, loyalty, innovation, interpersonal sensitivity, active criticism, and acceptance of criticism, we calculated a 2 (hierarchical position: superior versus subordinate) by 2 (gender of the participant) ANOVA for each characteristic separately. Table 1 shows the results of these ANOVAs with respect to the hierarchical position main effects. There was no significant difference in how much people expect superiors and subordinates to invest themselves into work and to be loyal. However, superiors more than subordinates were expected to be innovative, to be interpersonally sensitive, and to criticize actively. Conversely, subordinates more than superiors were expected to accept criticism.

In terms of gender main effects, women more than men expected both superiors and subordinates to be more interpersonally sensitive, $F(1,137) = 3.90$, $p = .05$, to show more loyalty, $F(1,137) = 2.30$, $p = .088$ (marginally significant effect), and to be more receptive of criticism, $F(1,137) = 6.12$, $p = .015$. None of the other gender main effects was significant (all F's < 2.34, all p's $> .128$). None of the interaction effects was significant (all F's < 2.68, all p's $> .103$).

We repeated the same ANOVAs with the two variables "own experience as superior" and "own experience as subordinate" as covariates but the results remained unchanged, indicating

that the expectations were unaffected by one's own experience as a superior or as a subordinate.

Discussion

The goal of Study 1 was to find out whether interpersonal sensitivity is a characteristic expected more from good leaders than from good subordinates. Based on the literature stressing the close link between good leadership and emotional sensitivity (e.g., emotional intelligence, social skills, and empathy), we investigated whether this link is also reflected in people's beliefs about a good leader. Our results confirmed that participants saw interpersonal sensitivity more indicative of good leadership than of good followership.

This result is not simply an effect of people generally harboring more pronounced expectations of any sort towards superiors than towards subordinates (maybe due to the fact that the superior role is more salient than the subordinate role). We found that for some of the characteristics we measured, there was no difference between the high and low power person (work investment and loyalty) and there was even a difference in the opposite direction. The latter indicated that good subordinates were expected to accept criticism more so than good superiors were. Also, the interpersonal sensitivity result cannot be explained by a halo effect of people fashioning more positive expectations about superiors than subordinates across the board (maybe due to the fact that the superior position seems more attractive to people) because again, on some other positive characteristics there was no difference (work investment and loyalty).

Note that the present study did not inflate the differences in expectations between superiors and subordinates because we used a between-subjects design. This means that one participant only responded to how he or she sees either a good superior or a good subordinate but not both. Therefore, the answers of the participants most likely did not result from a direct comparison of a good superior with a good subordinate as would have been the case in a

within-subjects design. In a within-subjects design, participants would have responded to the same questionnaires once referring to a good superior and once to a good subordinate. This would have made the hierarchy dimension salient such that responses concerning the good subordinate might have been given to contrast the responses concerning the good superior and vice versa, thus increasing the effects. We therefore suggest that our results do not overestimate the differences in expectations concerning good superiors and good subordinates; they might even be a conservative estimate of the real difference in expectations.

The results we found were independent of the personal experience of our participants as a superior or as a subordinate and also independent of gender (in that there was no significant interaction effect with gender). This is noteworthy because it shows that the expectations people have towards superiors and subordinates are relatively stable – at least independent of their own experience and their own gender.

Of course there are a number of limitations of the present study. Our results are, for instance, based on the relative difference between a good leader and a good subordinate. We therefore do not know which of the two is driving the effect. It is thus equivalent to say that good leaders are expected to be more interpersonally sensitive or to say that good subordinates are expected to be less interpersonally sensitive.

Moreover, we assessed only expectations and not whether superiors and subordinates really differ in interpersonal sensitivity. There is research strongly suggesting so. Schmid Mast et al. (2009) found high power individuals to be more interpersonally sensitive than low power ones. The goal of the present research was not to replicate these findings but to show that there is an expected relation between good leadership and interpersonal sensitivity.

We tested the attentional part of the interpersonal sensitivity construct, namely to pay attention to individual differences in states and traits. Strictly speaking, we do not know

whether the participants expect superiors to really *perform* better when assessing others. Note, however, that attentional accuracy is a precursor of inferential accuracy. Inferential accuracy is addressed in Study 2.

We did not specify to the participants what we meant by being a good leader (or by being a good subordinate, for that matter). Participants might have had many different concepts of a good leader or a good subordinate. However, this heterogeneity in the potential concepts would have worked against our finding of a difference between high and low power individuals. To demonstrate that the link between good leadership and interpersonal sensitivity does not only exist in the eye of the beholder but that the relation is actually there, we conducted Study 2.

Study 2

One aspect of good leadership is subordinate satisfaction. We hypothesized that the more interpersonally sensitive a leader is, the more satisfied his or her subordinate is. In Study 2, we focus on the inferential aspect of interpersonal sensitivity and we use an established measure to operationalize interpersonal sensitivity: the standardized Empathic Accuracy Paradigm (Ickes, 1997, 2003; Schmid Mast & Ickes, 2007). Many of the existing studies on interpersonal sensitivity and leadership focus on correct emotion recognition (Mayer et al., 2004; Wolff et al., 2002). We were not only interested in assessing how well a superior is able to judge another person's *emotions* but also in measuring how well a superior is able to correctly infer another person's *thoughts*. The Empathic Accuracy Paradigm measures both thoughts and emotions (Hall & Schmid Mast, 2007). Including this cognitive aspect in addition to the emotional one seems important when asking how well the superior can relate to his or her subordinates. The assessment of another person's needs, motives, and intentions not only relies on the accurate assessment of his or her feelings but also on correctly inferring how others think about the world (Katz, 1986; Mumford et al., 2000; Zaccaro et al., 1991).

Research has shown that interpersonal sensitivity is related to different leadership styles. There are two general kinds of leadership styles: task-oriented and socioemotional leadership, also labeled as "initiating structure" and "consideration" (Stogdill, 1974), as "production orientation" and "employee orientation" (Likert, 1967), or as "concern for production" and "concern for people" in the Leadership Grid approach (Blake & Mouton, 1985). Kellett, Humphrey, and Sleeth (2006) found that people who were judged to be better at correctly assessing others' emotions were rated as having more socioemotional leadership qualities whereas emotion recognition was unrelated to ratings of task leadership. Moreover, different studies show that socioemotional leadership is related to higher follower satisfaction (Yukl, 2006). In order to address the role of leadership style when investigating the link between interpersonal sensitivity and subordinate satisfaction, we included a measure of socioemotional and of relationship-oriented leadership in Study 2 (Bales, 1950; Taggar, Hacket, & Saha, 1999).

Method

Participants

Participants were 76 students majoring in different areas who participated in same-gender dyads (16 female-female dyads, 22 male-male dyads) for one hour. Participants were approached on campus and asked whether they would be willing to participate in a one-hour study on interpersonal interaction and perception. Participants were run in dyads and did not know each other. They were on average 26 years old (SD = 4.77, range = 20 – 45).

Procedure

Upon arrival, participants were randomly assigned to be either the leader or the subordinate for a subsequent dyadic interaction. They were informed that their task was to prioritize a list of items needed to survive in a lifeboat on the open sea and that they had 8

minutes to do so (Pfeiffer & Jones, 1970). They were told that the leader was responsible for leading the discussion, for the quality of the task solution, and for the time management.

After the interaction, the leader filled in a questionnaire measuring his or her relationship-oriented and task-oriented leadership. The subordinate reported how satisfied he or she was with the leader and how relationship-oriented and task-oriented he or she perceived the leader to be with the same questionnaire that the leader filled in. Also, leaders and subordinates indicated how dominant and competent they felt during the interaction and how much they liked their assigned role. Leaders then took the Empathic Accuracy Task (described in more detail later) to measure their interpersonal sensitivity.

Measures

Relationship-oriented leadership. The authors developed an 11-item questionnaire to assess relationship-orientation of the superior's leadership style during the face-to-face interaction (5 items reverse scored). The items were developed based on existing scales assessing relationship-oriented leadership but we opted for creating our own because the existing items are often phrased with reference to a long-term superior-subordinate relationship. This was not suitable for our purpose because the participants only interacted for 8 min.

Leaders and subordinates filled in the same questionnaire; however, for the leader version the items were phrased as statement about oneself (e.g., "I asked my subordinate for his or her opinion") whereas for the subordinate version the items were phrased as statement about the other person (e.g., "The leader asked for my opinion"). Additional sample items are: "I took my subordinate seriously" or "I tried to create a comfortable work atmosphere". Participants indicated on a scale from 1 (*do not agree at all*) to 6 (*agree very much*) how much they agreed with each statement. Cronbach's alpha of the scale filled in by leaders was .86 and Cronbach's alpha of the scale filled in by subordinates was .75. Item scores were averaged

and higher values indicate more relationship-orientation (leaders: $M = 5.24$, $SD = 0.49$; subordinates: $M = 5.17$, $SD = 0.68$).

Task-oriented leadership. A 5-item questionnaire was developed by the authors to assess task-orientation in leadership style (2 items reverse scored). For the same reasons stated above we opted for creating our own questionnaire instead of using established measures of task-oriented leadership. Leaders and subordinates filled in the same questionnaire; however, for the leader version the items were phrased as statement about oneself (e.g., "The goal achievement was important to me") and for the subordinate version the items were phrased as statement about another person (e.g., "The goal achievement was important to the leader"). Additional sample items are: "It was important to me to make progress in solving the task" or "I focused on solving the task". Participants indicated on a scale from 1 (*do not agree at all*) to 6 (*agree very much*) how much they agreed with each statement. Cronbach's alpha of the scale filled in by leaders was .71 and Cronbach's alpha of the scale filled in by subordinates was .71. Item scores were averaged and higher values indicate more task-orientation (leaders: $M = 4.99$, $SD = 0.63$; subordinates: $M = 5.27$, $SD = 0.51$).

Subordinate satisfaction. A 10-item self-report questionnaire was developed by the authors to measure subordinate satisfaction based on the interaction. Only subordinates filled in this questionnaire. Sample items are: "All in all, I was satisfied with the leader" or "The leader was inexperienced" (reverse scored). On a scale from 1 (*do not agree at all*) to 6 (*agree very much*) participants indicated how much they agreed with each statement. Cronbach's alpha was .81. Item scores were averaged and higher scores indicate more satisfaction ($M = 4.58$, $SD = 0.74$).

Manipulation check. We assessed how dominant and how competent each participant felt during the interaction, as well as how much each participant liked the assigned role. On a

scale from 1 (*do not agree at all*) to 6 (*agree very much*) participants indicated how much they agreed with each statement. We assessed felt dominance with 4 items such as "I tried to control the interaction" or "I felt dominant" that were averaged (Cronbach's alpha = .77, *M* = 3.63, *SD* = 0.90). We expected that participants in the leader role would feel more dominant than participants in the subordinate role.

Felt competence was assessed with 2 items: "I felt up to the task" and "I felt competent". Scores on those two items were averaged (Cronbach's alpha = .82, *M* = 4.31, *SD* = 0.98). How much each participant liked the assigned role was assessed with 2 items: "I felt comfortable in the assigned role" and "I did not feel at ease with the assigned role" (reverse scored). Both items were averaged (Cronbach's alpha = .76, *M* = 4.35, *SD* = 1.09). We designed the two roles to be equally attractive for participants and to convey equal competence. We thus expected the two roles not to differ on attractiveness and participants in both roles to feel equally competent.

Interpersonal sensitivity. To assess interpersonal sensitivity of the leaders we used the Empathic Accuracy Paradigm (Ickes, 1997, 2003). Leaders watched videotaped interactions of 3 different target dyads. Each target dyad was composed of a real superior with his or her real subordinate (a male superior with a female subordinate in a Swiss army recruiting center, a female superior with a female subordinate in the cleaning service of a Swiss university, and a male superior with a male subordinate in the information technology branch of an international company). Each target dyad was videotaped during 8 min while solving a survival task (Pfeiffer & Jones, 1970). After solving the task, the subordinate (target) individually watched the videotape and was instructed to stop the tape at each moment he or she had had a thought or a feeling during the interaction and to report it on a sheet of paper with the corresponding time stamp on the videotape (*actual* thought or feeling of subordinate target). We selected 3 min of the entire 8-min interaction of each dyad. The 3 min excerpt was

selected according to the criterion of the subordinate having had reported 8 thoughts or feelings within the 3-min time window.

Participants watched these video excerpts and the experimenter stopped the tape at the precise moment when the subordinate target individual indicated to have had an actual thought or feeling (8 stops per dyad, 24 stops total). Participants were instructed to infer the thought or feeling of the target subordinate each time the video was stopped and to write it down on a sheet of paper (*inferred* thought or feeling of subordinate target). For each stop, participants were given 45 sec to write down their answer.

Interpersonal sensitivity was the degree of similarity between the *actual* and the *inferred* thoughts and feelings rated by 2 coders on a scale of 0 (*not similar at all*), 1 (*somewhat similar*), and 2 (*similar*) (according to Ickes, 1997, 2003). Ratings of the two coders were averaged. Interrater reliability was r = .96 (M = 12.47, SD = 4.30, range: 4 – 21). Higher values indicate more interpersonal sensitivity.

Results

Manipulation Check

As predicted, assigned leaders felt more dominant (M = 3.94) during the interaction than assigned subordinates (M = 3.47), $t(37) = 2.02$, p = .05. There was no difference in felt competence between assigned leaders (M = 4.08) and assigned subordinates (M = 4.45), $t(37) = 1.51$, p = .14, and there was also no difference between assigned leaders (M = 4.07) and assigned subordinates (M = 4.36) with regard to how much they liked their respective role, $t(37) = 1.16$, p = .26.

Subordinate Satisfaction and Interpersonal Sensitivity

As hypothesized, subordinate satisfaction – as one important factor of good leadership – was positively related to the leader's interpersonal sensitivity, $r(38) = .48$, p = .001 (one-tailed). When controlling for gender with a partial correlation (because gender often shows

effects on interpersonal sensitivity; Hall, 1984; McClure, 2000), the result remained unchanged, rp (33) = .57, p = .0001. Note that subordinate satisfaction was measured during an interaction with the leader and leader interpersonal sensitivity in a subsequent unrelated standardized task.

Table 2 shows that interpersonal sensitivity of the leader was positively related to the subordinate's perception of relationship-oriented leadership but unrelated to the subordinate's perception of task-oriented leadership and unrelated to the leader's assessment of his or her leadership style as relationship- or task-oriented. Also, there was no significant gender difference in interpersonal sensitivity.

Table 2 also shows the relation of subordinate satisfaction to the other variables. The way the subordinate perceived the superior's leadership style was related to subordinate satisfaction. The more the superior was perceived as showing a relationship-oriented leadership style and the more the superior was perceived as showing a task-oriented leadership style the more the subordinate was satisfied. However, the self-perception of the leader about his or her leadership style was unrelated to subordinate satisfaction as was gender. Note that none of the relations depicted in Table 2 changed when controlling for gender and calculating partial correlations.

To determine the relative influence of the leader's interpersonal sensitivity on subordinate satisfaction while controlling for all other variables, we calculated a linear regression in which we regressed subordinate satisfaction on the variables shown in Table 3. Interpersonal sensitivity remains a significant contributor to subordinate satisfaction and so does perceived relationship-oriented leadership style and gender (women more satisfied than men). We then tested whether interpersonal sensitivity had incremental validity to explain the variance in subordinate satisfaction. To do this, we calculated the same linear regression as reported in Table 3 but without interpersonal sensitivity and we tested whether the initial regression that

included interpersonal sensitivity yielded a significant increase in explained variance when compared to the regression model without interpersonal sensitivity. This was indeed the case: *R* square change for the inclusive model was .07, F_{change} (1, 29) = 4.65, p = .039.

Discussion

We predicted and found that good leaders – operationalized as leaders with satisfied subordinates – are more interpersonally sensitive, thus better at correctly assessing subordinates' thoughts and feelings. Our results also show that the extent to which the subordinate perceived the leader to adopt a relationship-oriented leadership style was related to the leader's interpersonal sensitivity. These results confirm existing results showing that superiors who were judged as good at identifying emotions were also perceived as showing relationship-oriented leadership but not necessarily task-oriented leadership (Kellett et al., 2006). Note that perceived relationship-oriented leadership did not explain the relation between interpersonal sensitivity and subordinate satisfaction. Thus, interpersonal sensitivity is a variable that shows incremental validity for explaining subordinate satisfaction.

Subordinate satisfaction was measured after a real face-to-face interaction between a high and low power individual whereas the leader's interpersonal sensitivity was assessed in a completely unrelated (standardized) task of assessing thoughts and feelings of subordinates who did not even interact with our participant leaders; thus a task entirely independent of the interaction. The result can therefore not be due to shared method variance or contamination.

To assess interpersonal sensitivity, we used a standardized tape with target subordinates to be assessed. This had the advantage of circumventing the problem inherent in measuring interpersonal sensitivity in face-to-face interactions, namely the confounding of targets' expressiveness with perceivers' interpersonal sensitivity (Hall, Rosip, Smith LeBeau, Horgan, & Carter, 2006; Snodgrass, Hecht, & Ploutz-Snyder, 1998). Targets who are more expressive are easier to read. To control for target expressiveness we did not use face-to-face interactions

to assess interpersonal sensitivity; we presented the same subordinate targets on videotape to all participants by using the standardized Empathic Accuracy Paradigm (Ickes, 1997, 2003).

We used a measure of subordinate satisfaction with one's leader. Note that job satisfaction is a broader construct encompassing many more facets such as, for instance, compensation satisfaction (Scarpello & Campell, 1983). Because subordinate satisfaction was measured in an experimental setting and not in a real job setting, only the satisfaction with the leader aspect of job satisfaction could be assessed.

We did not find any significant gender effects with the exception of women being more satisfied than men (Table 3). Meta-analytic research clearly shows a gender difference in interpersonal sensitivity favoring women (Hall, 1984; McClure, 2000). However, the individual tests vary with respect to whether they show a gender effect or not. Note that we repeated all the analyses while controlling for gender and the results did not change, meaning that the reported results are independent of gender.

Future research might want to investigate whether the followers' interpersonal sensitivity was linked to the superiors' satisfaction in order to show whether people are more satisfied with interpersonally sensitive interaction partners in general.

General Discussion

The goal of the present research was to show that people think that interpersonal sensitivity is an important attribute for good leaders and that good leadership – leadership that is characterized by satisfied subordinates – is related to higher levels of the superior's interpersonal sensitivity. This is exactly what we found.

In Study 1 we showed that people expect good leaders to be more attuned to individual differences in others' traits and states than good subordinates are. That followers have specific expectations about leadership behavior and characteristics is well-documented in the research addressing implicit leadership theories and leadership prototypes (Kenney et al., 1994;

Kenney et al., 1996; Lord et al., 2001). Investigating the role that interpersonal sensitivity plays with regard to expectations harbored towards good leaders is new.

Knowing that leaders are expected to be interpersonally sensitive is important for leadership training because as a general principle, work-related expectations that are not fulfilled entail dissatisfaction (Kopelman, 1979). So, if leaders can be trained to show an interest in their collaborators as a person and in how they feel and what they think, subordinates might be particularly satisfied with these superiors because their behavior corresponds to what subordinates expect from good superiors. Research on interpersonal sensitivity suggests that training of interpersonal sensitivity is possible (Costanzo, 1992).

Study 2 showed that the more interpersonally sensitive a leader is the more satisfied his or her subordinate is. This confirms Murphy's (2002) finding of a positive relation between a leader's emotional sensitivity (assessed with a questionnaire) and follower satisfaction. Moreover, subordinates of more interpersonally sensitive leaders perceived their superior's leadership style as being more relationship-oriented. Many authors have underscored the importance of interpersonal sensitivity for good leadership (Bass, Avolio, Jung, & Berson, 2003; Kellett et al., 2002; Mayer et al., 2004; Palmer et al., 2001; Wolff et al., 2002; Zaccaro et al., 1991) and in particular for subordinate satisfaction (Lowe et al., 1996; Yukl, 2006).

Because we assigned the leader and subordinate roles randomly, there is no confound of the power position with preexisting abilities of interpersonal sensitivity. Although it is possible that in established hierarchical relations, high power people might be more interpersonally sensitive because interpersonal sensitivity helped them to attain their high status position, this is not a valid explanation for our results. How exactly superior interpersonal sensitivity is linked to subordinate satisfaction and whether we can in fact postulate a causal relationship remains to be tested. It was beyond the scope of the present research. We think that an interpersonally sensitive leader is able to tune into the needs of the

subordinates; he or she recognizes whether it is a good time to allocate a specific task to a specific person. As an example, an interpersonally sensitive superior would be able to identify correctly that one of his or her followers is in a sad mood or depressed (even if the follower does not explicitly share his or her feelings with the superior) and would therefore decide to put a colleague of this particular follower in charge of a new demanding and stressful project. The optimal matching of followers to specific jobs potentially results in more satisfied subordinates. Moreover, it is possible that interpersonally sensitive superiors are more effective communicators because they have the capability "to tune into" their subordinates' thoughts and feelings. Research shows that supervisor communication and the way he or she gives personal feedback are related to subordinate job satisfaction (Pincus, 2006). Future research might want to investigate whether the communication or interaction styles of highly interpersonally sensitive leaders are different from less interpersonally sensitive leaders. Our result – showing a positive relation between interpersonal sensitivity and perceived superior relationship-orientation – hints to the interpersonally sensitive leader adopting an interaction style that is different from that adopted by less sensitive leaders.

We also showed that interpersonal sensitivity and perceived relationship-orientation both explained subordinate satisfaction independent of each other. Interpersonal sensitivity is thus a necessary but not sufficient prerequisite for achieving high team member satisfaction. Moreover, having the skills to accurately assess others does not guarantee that the superior will act accordingly. Conversely, if the superior lacks interpersonal sensitivity skills, an important prerequisite for his or her actions is missing.

It goes without saying that good leadership has many facets. In the present research we focused on good leadership as people's expectations (Study 1) and as subordinate satisfaction (Study 2) but we did not assess performance of the superior, the subordinate, or of the dyad. Whether increased leader interpersonal sensitivity is related to better subordinate performance

or to better team or dyadic performance is an open question. Given the positive link between job satisfaction and job performance (Judge et al., 2001) one could assume such a relation. There is support for the claim that interpersonal sensitivity is related to better performance. Salespersons with better nonverbal emotion recognition were more successful in their job (Byron, Terranova, & Nowicki, 2007) and better emotion recognition was related to better negotiation outcomes (Elfenbein, Foo, White, Tan, & Aik, 2007). However, there is also empirical evidence showing the opposite. For instance, Murphy (2002) reports a negative relation between emotional sensitivity of a group leader and group task performance. Riggio et al. (2003, Study 2) report no relation between a self-reported social sensitivity measure and team performance or ratings of performance by subordinates or superiors. Whether, to what extent, and under what circumstances the boss's attunement and correct inference of others' thoughts and feelings are not only related to more satisfaction but impact directly performance remains to be tested.

Future research might want to investigate the relation between interpersonal sensitivity and subordinate satisfaction in a real, established status hierarchy. It is possible that in established hierarchical relationships, the superior's interpersonal sensitivity becomes even more important for subordinate satisfaction because if subordinates are confronted with insensitive leaders, they might leave the job as an ultimate consequence of dissatisfaction.

Due to increased social and geographical mobility within the workforce it seems important to know what people are looking for in a good superior because employees are, within certain limits, free to look for another position when dissatisfied with their superior. That satisfaction with the superior is a major driving factor for overall job satisfaction has been well-documented (Harter et al., 2002).

Moreover, although many leadership trainings already focus on interpersonal skills, it might be beneficial to employ a more performance based training similar to the sort of task used in the present study (empathic accuracy).

References

Ambady, N., Hallahan, M., & Rosenthal, R. (1995). On judging and being judged accurately in zero-acquaintance situations. *Journal of Personality and Social Psychology, 69,* 518-529.

Ambady, N., LaPlante, D., & Johnson, E. (2001). Thin-slice judgments as a measure of interpersonal sensitivity. In J. A. Hall & F. J. Bernieri (Eds.), *Interpersonal sensitivity: Theory and measurement* (pp. 89-101). Mahwah, NJ: Erlbaum.

Bales, R. F. (1950). *Interaction process analysis: A method for the study of small groups*. Cambridge, MA: Addison-Wesley.

Barnes, M. L., & Sternberg, R. J. (1989). Social intelligence and decoding of nonverbal cues. *Intelligence, 13,* 263-287.

Bass, B. M. (1985). *Leadership and performance beyond expectations*. New York: Free Press.

Bass, B. M., Avolio, B. J., Jung, D. I., & Berson, Y. (2003). Predicting unit performance by assessing transformational and transactional leadership. *Journal of Applied Psychology, 88,* 207-218.

Bernieri, F. J., Davis, J. M., Rosenthal, R., & Knee, C. R. (1994). Interactional synchrony and rapport: Measuring synchrony in displays devoid of sound and facial affect. *Personality and Social Psychology Bulletin, 20,* 303-311.

Blake, R. R., & Mouton, J. S. (1985). *The Managerial Grid III*. Houston, TX: Gulf.

Borkenau, P., & Liebler, A. (1992). Trait inferences: Sources of validity at zero acquaintance. *Journal of Personality and Social Psychology, 62*, 645-657.

Brown, S. P. (1996). A meta-analysis and review of organizational research on job involvement. *Psychological Bulletin, 120,* 235-255.

Brown, S. P., & Leigh, T. W. (1996). A new look at psychological climate and its relationship to job involvement, effort, and performance. *Journal of Applied Psychology, 81,* 358-368.

Burns, J. M. (1978). *Leadership*. New York: Harper & Row.

Byron, K. (2007). Male and female managers' ability to "read" emotions: Relationships with supervisor's performance ratings and subordinates' satisfaction ratings. *Journal of Occupational and Organizational Psychology, 80*, 713-733.

Byron, K. (2008). Differential effects of male and female managers' non-verbal emotional skills on employees' ratings. *Journal of Managerial Psychology, 23*, 118-134.

Byron, K., Terranova, S., & Nowicki, S., Jr. (2007). Nonverbal emotion recognition and sales persons: Linking ability to perceived and actual success. *Journal of Applied Social Psychology, 18*, 407-412.

Costanzo, M. (1992). Training students to decode verbal and nonverbal cues effects on confidence and performance. *Journal of Educational Psychology, 84,* 308-313.

Davis, M. H., Hull, J. G., Young, R. D., & Warren, G. G. (1987). Emotional reactions to dramatic film stimuli: The influence of cognitive and emotional empathy. *Journal of Personality and Social Psychology, 52,* 126-133.

Elfenbein, H. A., Foo, M. D., White, J., Tan, H. H., & Aik, V. C. (2007). Reading your counterpart: The benefit of emotion recognition accuracy for effectiveness in negotiation. *Journal of Nonverbal Behavior, 31*, 205-223.

Faragher, E. B., Cass, M., & Cooper, C. L. (2005). The relationship between job satisfaction and health: A meta-analysis. *Occupational and Environmental Medicine, 62,* 105-112.

Funder, D. C. (1995). On the accuracy of personality judgment: A realistic approach. *Psychological Review, 102*, 652-670.

Funder, D. C. (1999). *Personality judgment: A realistic approach to person perception*. San Diego, CA: Academic Press.

George, J. M. (2000). Emotions and leadership: The role of emotional intelligence. *Human Relations, 53,* 1027-1055.

Hall, J. A. (1984). *Nonverbal sex differences: Communication accuracy and expressive style.* Baltimore: Johns Hopkins University Press.

Hall, J. A., Andrzejewski, S. A., & Yopchick, J. E. (2009). Psychosocial correlates of interpersonal sensitivity: A meta-analysis. *Journal of Nonverbal Behavior, 33,* 149-180.

Hall, J. A., & Bernieri, F. J. (Eds.). (2001). *Interpersonal sensitivity: Theory and measurement*. Mahwah, NJ: Erlbaum.

Hall, J. A., & Halberstadt, A. G. (1994). "Subordination" and sensitivity to nonverbal cues: A study of married working women. *Sex Roles, 31,* 149-165.

Hall, J. A., Murphy, N. A., & Schmid Mast, M. (2006). Recall of nonverbal cues: Exploring a new definition of interpersonal sensitivity. *Journal of Nonverbal Behavior, 30*, 141-155.

Hall, J. A., Rosip, J. C., Smith LeBeau, L., Horgan, T. G., & Carter, J. D. (2006). Attributing the sources of accuracy in unequal-power dyadic communication: Who is better and why? *Journal of Experimental Social Psychology, 42*, 18-27.

Hall, J. A., & Schmid Mast, M. (2007). Sources of accuracy in the empathic accuracy paradigm. *Emotion, 7,* 438-446.

Harter, J. K., Schmidt, F. L., & Hayes, T. L. (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis. *Journal of Applied Psychology, 87,* 268-279.

Horgan, T. G., Schmid Mast, M., Hall, J. A., & Carter, J. D. (2004). Gender differences in memory for the appearance of others. *Personality and Social Psychology Bulletin, 30,* 185-196.

Ickes, W. (1997). *Empathic accuracy*. New York: Guilford Press.

Ickes, W. (2003). *Everyday mind reading: Understanding what other people think and feel*. Amherst, MA: Prometheus Books.

Judge, T. A., Thoresen, C. J., Bono, J. E., & Patton, G. K. (2001). The job satisfaction - job performance relationship: A qualitative and quantitative review. *Psychological Bulletin, 127,* 376-407.

Kaiser, R. B., Hogan, R., & Craig, S. B. (2008). Leadership and the fate of organizations. *American Psychologist, 63*, 96-110.

Katz, R. L. (1986). Skills of an effective administrator. *Harvard Business Review, 64,* 198.

Kellett, J. B., Humphrey, R. H., & Sleeth, R. G. (2002). Empathy and complex task performance: Two routes to leadership. *Leadership Quarterly, 13,* 523-544.

Kellett, J. B., Humphrey, R. H., & Sleeth, R. G. (2006). Empathy and the emergence of task and relations leaders. *Leadership Quarterly, 17,* 146-162.

Kenney, R. A., Blascovich, J., & Shaver, P. R. (1994). Implicit leadership theories: Prototypes for new leaders. *Basic and Applied Social Psychology, 15,* 409-437.

Kenney, R. A., Schwartz-Kenney, B. M., & Blascovich, J. (1996). Implicit leadership theories: Defining leaders described as worthy of influence. *Personality and Social Psychology Bulletin, 22,* 1128-1143.

Kopelman, R. E. (1979). Directionally different expectancy theory predictions of work motivation and job satisfaction. *Motivation and Emotion, 3,* 299-317.

Lawrence, E. J., Shaw, P., Baker, D., Baron-Cohen, S., & David, A. S. (2004). Measuring empathy: Reliability and validity of the Empathy Quotient. *Psychological Medicine, 34*, 911-920.

Likert, R. (1967). *The human organization: Its management and value*. New York: McGraw-Hill.

Lord, R. G., Brown, D. J., Harvey, J. L., & Hall, R. J. (2001). Contextual constraints on prototype generation and their multilevel consequences for leadership perceptions. *Leadership Quarterly, 12*, 311-338.

Lowe, K. B., Kroeck, K. G., & Sivasubramaniam, N. (1996). Effectiveness correlates of transformational and transactional leadership: A meta-analytic review of the MLQ literature. *Leadership Quarterly, 7*, 385-425.

Matsumoto, D., LeRoux, J., Wilson-Cohn, C., Raroque, J., Kooken, K., Ekman, P., …, Goh, A. (2000). A new test to measure emotion recognition ability: Matsumoto and Ekman's Japanese and Caucasian Brief Affect Recognition Test (JACBART). *Journal of Nonverbal Behavior, 24*, 179-209.

Mayer, J. D., Caruso, D. R., & Salovey, P. (2000). Selecting a measure of emotional intelligence: The case for ability testing. In R. Bar-On & J. D. A. Parker (Eds.), *Handbook of emotional intelligence* (pp. 320-342). New York: Jossey-Bass.

Mayer, J. D., Salovey, P., & Caruso, D. R. (2004). Emotional intelligence: Theory, findings, and implications. *Psychological Inquiry, 15*, 197-215.

McCauley, C. D. (2004). Successful and unsuccessful leadership. In J. Antonakis, A. T. Cianciolo & R. J. Sternberg (Eds.), *The nature of leadership* (pp. 199-221). Thousand Oaks, CA: Sage Publications.

McClure, E. B. (2000). A meta-analytic review of sex differences in facial expression processing and their development in infants, children, and adolescents. *Psychological Bulletin, 126,* 424-453.

Mumford, M. D., Zaccaro, S. J., Harding, F. D., Owen Jacobs, T., & Fleishman, E. A. (2000). Leadership skills for a changing world: Solving complex social problems. *Leadership Quarterly, 11*, 11-35.

Murphy, S. E. (2002). Leader self-regulation: The role of self-efficacy and multiple intelligences. In R. E. Riggio, S. E. Murphy & F. J. Pirozzolo (Eds.), *Multiple intelligences and leadership* (pp. 163-186). Mahwah, NJ: Erlbaum.

Murphy, N. A., Hall, J. A., & Colvin, C. R. (2003). Accurate intelligence assessments in social interactions: Mediators and gender effects. *Journal of Personality, 71*, 465-493.

Nye, J. L., & Forsyth, D. R. (1991). The effects of prototype-based biases on leadership appraisals. *Small Group Research, 22*, 360-379.

Ones, D. S., & Viswesvaran, C. (1998). Integrity testing in organizations. In R. W. Griffin, A. O'Leary-Kelly & J. M. Collins (Eds.), *Dysfunctional behavior in organizations: Vol. 2. Nonviolent behaviors in organizations* (pp. 243-276). Greenwich, CT: JAI Press.

Overbeck, J. R., & Park, B. (2001). When power does not corrupt: Superior individuation processes among powerful perceivers. *Journal of Personality and Social Psychology, 81*, 549-565.

Palmer, B., Walls, M., Burgess, Z., & Stough, C. (2001). Emotional intelligence and effective leadership. *Leadership & Organization Development Journal, 22*, 5-10.

Pfeiffer, J. W., & Jones, J. E. (1970). *A handbook of structured experiences for human relations training*. Iowa City, IA: University Press.

Pincus, J. D. (2006). Communication satisfaction, job satisfaction, and job performance. *Human Communication Research, 12*, 395-419.

Riggio, R. E., Tucker, J., & Coffaro, D. (1989). Social skills and empathy. *Personality and Individual Differences, 10,* 93-99.

Riggio, R. E., Riggio, H. R., Salinas, C., & Cole, E. J. (2003). The role of social and emotional communication skills in leader emergence and effectiveness. *Group Dynamics, 7,* 83-103.

Rosenthal, R., Hall, J. A., DiMatteo, M. R., Rogers, P. L., & Archer, D. (1979). *Sensitivity to nonverbal communication: The PONS test*. Baltimore: The Johns Hopkins University Press.

Scarpello, V., & Campell, J. C. (1983). Job satisfaction: Are all the parts there? *Personnel Psychology, 36,* 577-600.

Schmid Mast, M., & Hall, J. A. (2004). Who is the boss and who is not? Accuracy of judging status. *Journal of Nonverbal Behavior, 28,* 145-165.

Schmid Mast, M., & Hall, J. A. (2006). Women's advantage at remembering others' appearance: A systematic look at the why and when of a gender difference. *Personality and Social Psychology Bulletin, 32,* 353-364.

Schmid Mast, M., & Ickes, W. (2007). Empathic accuracy: Measurement and potential clinical applications. In T. Farrow and P. Woodruff (Eds.), *Empathy in mental illness* (pp. 408-427). Cambridge, MA: Cambridge University Press.

Schmid Mast, M., Jonas, K., & Hall, J. A. (2009). Give a person power and he/she will show interpersonal sensitivity: The phenomenon and its why and when. *Journal of Personality and Social Psychology, 97,* 835-850.

Schmid Mast, M., Murphy, N. A., & Hall, J. A. (2006). A brief review of interpersonal sensitivity: measuring accuracy in perceiving others. In D. Chadee & J. Young (Eds.), *Current themes in social psychology* (pp. 163-185). Trinidad: University of the West Indies Press.

Snodgrass, S. E., Hecht, M. A., & Ploutz-Snyder, R. (1998). Interpersonal sensitivity: Expressivity or perceptivity? *Journal of Personality and Social Psychology, 74*, 238-249.

Stogdill, R. M. (1974). *Handbook of leadership: A survey of theory and research*. New York: Free Press.

Taggar, S., Hacket, R., & Saha, S. (1999). Leadership emergence in autonomous work teams: Antecedents and outcomes. *Personnel Psychology, 52*, 899-926.

Wolff, S. B., Pescosolido, A. T., & Druskat, V. U. (2002). Emotional intelligence as the basis of leadership emergence in self-managing teams. *Leadership Quarterly, 13*, 505-522.

Yukl, G. (2006). *Leadership in organizations (6th ed.)*. Upper Saddle River, NJ: Prentice Hall.

Zaccaro, S. J., Gilbert, J., Thor, K. K., & Mumford, M. D. (1991). Leadership and social intelligence: Linking social perceptiveness and behavioral flexibility to leader effectiveness. *Leadership Quarterly, 2*, 317-331.

Table 1

Main Effects of Expectations towards Good Superiors and Good Subordinates

Characteristics	Good superiors (*M*)	Good subordinates (*M*)	*F*	*p*
Work investment	3.97	3.84	1.59	.21
Loyalty	4.45	4.35	1.33	.25
Innovation	4.35	4.00	9.80	.002
Interpersonal sensitivity	4.07	3.84	6.40	.013
Active criticism	4.00	3.65	9.06	.003
Acceptance of criticism	4.03	4.39	11.53	.001

Note: $df = 137$

Table 2

Intercorrelations

Variables	Interpersonal sensitivity	Satisfaction	Perceived RO leader	Perceived TO leader	Self-reported RO leader	Self-reported TO leader
Satisfaction	.48**					
Perceived RO leader	.46**	.53**				
Perceived TO leader	.25	.39*	.39*			
Self-reported RO leader	.16	-.14	.15	.04		
Self-reported TO leader	-.02	-.06	.09	.21	.19	
Gender	.12	-.16	.27†	.30†	.01	.24

Note: "RO leader" means "relationship-oriented leadership" and "TO leader" means "task-oriented leadership", $N = 38$ except for self-reported TO leader, $N = 36$, due to missing data. Gender was coded 1 for males and 0 for females. † $p < .10$; * $p < .05$, ** $p < .01$.

Table 3

Multiple Linear Regression of Subordinate Satisfaction

Variable	*B*	*SE B*	Beta
Interpersonal sensitivity	.06	.03	.32*
Perceived relationship-oriented leadership	.48	.18	.41*
Perceived task-oriented leadership	.47	.29	.23
Self-reported relationship-oriented leadership	-.34	.20	-.22†
Self-reported task-oriented leadership	-.08	.22	-.05
Gender	-.51	.20	-.34*

Note. $R^2 = .60$, $F(6, 29) = 7.10$, $p = .0001$. Gender was coded 1 for males and 0 for females. † $p < .10$; * $p < .05$

ARTICLE 3

Sauer, J., Darioly, A., Schmid Mast, M., Schmid, P. C., & Bischof, N. (2010). A multi-level approach of evaluating crew resource management training: A lab-based study examining communication skills as a function of team congruence. *Ergonomics, 35(11),* 1311-1324.

Status Hierarchy, Task Competence, and Communication Skills in Teams: Effects on Team Performance

J. Sauer[a], A. Darioly[b], M. Schmid Mast[b], P.C. Schmid[b], N. Bischof[a]

a Department of Psychology, University of Fribourg, Fribourg, Switzerland
b Department of Work and Organizational Psychology, University of Neuchatel, Neuchatel, Switzerland

Corresponding author: Jürgen Sauer, Department of Psychology, University of Fribourg, Rue de Faucigny 2, 1700 Fribourg, Switzerland; phone: +41-26-3007622; Fax: +41-26-3009712; email: juergen.sauer@unifr.ch

This article examines the effectiveness of communication skills training (CST) as an important element of crew resource management (CRM) training in matching or mismatching team compositions with respect to hierarchical status and competence. There is little experimental research that evaluated the effectiveness of CRM training at multiple levels (i.e., reaction, learning, behaviour) and in teams composed of members of different status and competence. An experiment with a 2 (CST: with vs. without) by 2 (competence / hierarchical status: congruent vs. incongruent) design was carried out. Sixty-four participants were trained for 2.5 hrs on a simulated process control environment, with the experimental group being given 45 min of training on receptiveness and influencing skills. Prior to the 1-hr experimental session, participants were assigned to two-person teams. Primary task performance was unaffected by CST and team congruence, though incongruent teams showed performance decrements on a secondary task, with the decrements being less pronounced under CST. Positive effects of CST were found for various subjective measures (e.g., quality of team collaboration). Modifications of CRM training may need to be considered.

Key words: communication skills, crew resource management training, team composition, performance

1. Introduction

The use of teams for operating complex technical work environments is quite common in many application areas. These teams often have a hierarchical structure (e.g., captain and crew member on a ship's bridge). However, the team member (TM) entrusted with the leadership position may not always be the one with the highest task competence. This may refer to highly situation-specific aspects of competence (e.g., co-pilot draws right conclusion from display information while the captain does not) as well as to situation-unspecific aspects of competence (e.g., if a very experienced pilot is employed as first officer by an airline; Ginnett, 1993). In both cases, a mismatch between hierarchical position and task competence bears the risk of sub-optimal team performance.

The goal of the present study was to investigate how hierarchically structured teams whose hierarchical organization was either congruent or incongruent with the distribution of competence among the TMs (congruent = high status person is the more competent one; incongruent = low status person is the more competent one)

affects team outcomes (e.g., task performance, team involvement) and how communication skills training (CST) impacts on these relations or team outcomes.

1.1 Team member competence and hierarchical status

While the competence of individual TMs makes up the competence of a team, this may not follow a simple principle (i.e., team performance equals the sum of the performance of individual TMs) but depends on the type of task (Steiner 1972). For example, for disjunctive tasks, overall team performance is determined by the best TM (e.g., solving a mathematical problem), whereas for conjunctive tasks, the worst TM determines overall team performance (e.g., speed of task completion at an assembly line). Because many team tasks are of the disjunctive nature (Littlepage 1991), we used such a task to ascertain the ecological validity of our study. Previous research using the same task environment as in the present study indicated that the tasks used are of a disjunctive nature (Sauer *et al.* 2006).

While team performance is determined by the best TM in disjunctive tasks, this effect may be influenced by the hierarchical status of the individual (leader vs. subordinate). There is evidence in the literature that a matching competence/status hierarchy provides more benefits than a mismatching hierarchy. For example, Katz and Kahn (1952) showed that the competence of the higher status TM is positively related to the lower status TM's satisfaction. Team morale (i.e., the ability of a team to pull together consistently in pursuit of a common goal) was higher when there was a match between team leader's competence and status (Hamblin *et al.* 1961). However, the effects of a mismatch between status and competence may not be entirely negative. For example, in organizational decision-making, low status TMs were found to increase their participation in team decision-making processes when high status TMs were less competent (Salam 1998). Overall, these studies suggest that the mismatch between status and competence can be a liability for teams.

Expectation States Theory (EST, Berger *et al.* 1977) explains how status and competence interplay. According to EST, status hierarchies form according to how much each TM is able to contribute to the task solution (performance expectations). Such performance expectations are based either on diffuse status characteristics (e.g., gender, age) or on specific status characteristics (e.g., expertise). Since the status characteristics are culturally based, they are typically shared by all TMs. As a consequence, TMs with high performance expectations are given more opportunities to contribute, their contributions are more valued, and they finally gain more influence on group decisions, thus more status. In other words, performance expectations become self-fulfilling prophecies. Under an EST perspective, if the leader does not have the required task competence, he/she may be considered illegitimate. Although leaders are freer to break norms than subordinates (Cohen and Lee 1975), their high status position may be in jeopardy if the task competence is lacking. Individuals in a so-called illegitimate high status position perceived their position as instable and felt therefore the need to justify themselves often (Turner and Brown 1978). Subordinates of such 'illegitimate' leaders were more likely to resist and challenge the leaders' decisions and directives (Wehr *et al.* 1994; Darioly & Schmid Mast, in press).

Negative effects that occur as a result of a mismatch between status and competence might be less severe if team coordination processes allow for an optimal use of team resources. Modern concepts of leadership have tried to overcome the classic model of "static" vertical leadership, which postulates the exertion of power by a specific individual across situations (Bass 1990). In teams operating complex technical systems, the situation may require that leadership behaviour is also adopted

by other TMs than the formally designated leader (e.g., first officer carries out an emergency landing). This idea is conceptualised in the concepts of situated leadership (Falk 1999) or shared leadership (Pearce & Sims, 2002). Research has shown that teams operating in critical situations under time pressure benefit very much from shared leadership (Perry, Pearce & Sims, 1999). Therefore, the detrimental effects of an incompetent leader together with a competent subordinate might be attenuated by such horizontal leadership concepts that emphasise the importance of effective within-team communication and a more flexible adoption of leadership behaviour. We were interested in testing whether improving communication and coordination skills of mismatched team with CST as an important element of Crew Resource Management (CRM) Training might be beneficial and entail a more optimal use of team resources.

1.2 Crew resource management training

Due to the negative effects that status differences may have on team performance under some circumstances, measures have been conceived to reduce their possible detrimental impact. One of these measures represents CRM training (e.g., Salas *et al.* 2001). The main goal of CRM training is to provide TMs with a range of non-technical skills needed to achieve good team performance and smooth team interaction.

Although there is no standardized training programme, CRM training follows a number of principles. Core elements of CRM training include human error and reliability, company safety culture, stress management, information processing and situation awareness, decision-making, leadership, and communication (Droog 2004). A chief objective of CRM training is to equip TMs with good communication skills, which include receptiveness and influencing skills.

Receptiveness involves paying attention to the ideas, comments and questions of other TMs (Dunlap & Mangold, 1998). It relates to specific behaviours, such as encouraging feedback, incorporating suggestions from others into decisions, and active listening. Influencing skills involve using effective interpersonal skills and appealing to other TMs' logic in order to win support for an idea or viewpoint. It relates to specific behaviours, such as using tact when asserting a position and employing an appropriate level of assertion.

While CRM training has been widely employed, there have been concerns about its effectiveness (Salas *et al.* 2000). Two reviews of the literature on CRM training concluded that there is a great variety in the kind of data collected across studies (Salas *et al.* 2001, Salas *et al.* 2006). Following Kirkpatrick's (1976) distinction of different criteria for training effectiveness, most positive evidence was found at the first level (reaction, i.e., how much did trainees like the training). At the second level (learning, i.e., did the trainee increase knowledge or change work attitude), positive evidence became less strong while at the third level (behaviour, i.e., was the trainee able to improve performance) even less so. At the fourth level (results, i.e., organizational impact) hardly any evidence is available due to the dearth of studies measuring this aspect.

Based on the results of their literature reviews, Salas et al. (2006) argued for a need to carry out more studies measuring training effectiveness at several levels, following Kirkpatrick's distinction. Even at a specific level (e.g., behaviour), there would be a need to measure various facets of the outcome (e.g., measuring several facets of behaviour such as multiple task performance). Moreover, most of the studies

reported were quasi-experimental studies (79.4 %) and a reasonable number were post-hoc studies (17.6 %) while hardly any experiments were carried out (2.9 %).

1.3 Coping with sub-optimal working conditions

To determine the effectiveness with which team resources are employed, several aspects of operator behaviour can be measured. To gain a better understanding of how these different aspects of behaviour contribute to overall performance, Hockey's (1997) model of compensatory control mechanisms may be helpful. Developed in the context of stress research, the model argues that operators aim to maintain adequate levels of performance on high priority tasks (i.e., primary tasks), even if working conditions become increasingly difficult (e.g., onset of noise, extended task involvement). Performance maintenance is achieved by a compensatory process in which additional cognitive resources are recruited to the primary task. However, this may not be without cost and may therefore result in performance decrements in secondary tasks (e.g., lower priority tasks such as log-keeping are not carried out regularly) or in non-optimal task management strategies (e.g., reduced sampling of peripheral displays). In order to measure these forms of compensatory behaviour suggested by Hockey's model, a methodological approach is required that takes different measures at the behavioural level.

1.4 The present study

Based on EST and several studies showing that if the leader is not the one with the most pronounced task competence, we expected that teams in which the status hierarchy did not match the task competence hierarchy would perform worse than teams in which both type of hierarchies matched. We therefore created teams with a formal hierarchy in which the individual task competences matched the status roles or not. We thus had congruent teams comprising a legitimate leader (task-competent) and a legitimate subordinate (task-incompetent) and we had incongruent teams comprising an illegitimate leader (task incompetent) and an illegitimate subordinate (task competent).

We predicted that CRM training would be more helpful for incongruent teams than for congruent teams because the performance gains that can be made from improving within-team cooperation and communication in non-optimal team compositions are greater than in teams that already have a positive team composition. This refers to the relationship of CRM skills and task competencies. For example, if the task competencies of a TM are high, he or she may not need to make use of CRM skills to tap into the team mate's competencies.

In the present study, the focus of CRM training was on two critical communication skills (receptiveness and influencing skills) since covering the full content of CRM training was beyond the scope of the study. Receptiveness and influencing skills were considered to be important elements of CRM training since they help teams cope better with fault states of the simulated process control environment. This applies in particular to situations where team composition is non-optimal due to incongruence. In the incongruent teams, there is a particular need for the competent assistant to make his/her specific technical knowledge known to the leader (i.e., influencing skills) rather than silently observing how the low-competence leader attempts to manage the system in a non-optimal way. Conversely, there is a special need for the low-competence leader to be sufficiently accessible to the

suggestions offered by the assistant (i.e., receptiveness). For the congruent teams, we expected any positive effects of CRM training to be much smaller than for incongruent ones, with the possibility of even detrimental effects of CRM training being observed. This is because in congruent teams there is a lesser need to exchange critical information so that extensive (but unproductive) discussions in teams may divert cognitive resources from the main task (e.g., if a less competent assistant persistently tries to influence a competent leader to take a certain course of action).

To meet the demands of Salas et al. (2001, 2006) that the effectiveness of CRM training should be measured at multiple levels, the present study aims to collect various aspects of reactions, learning, and behaviour, following Kirkpatrick's (1976) model. Therefore, in the present study, a computer-based simulation was employed to model a complex process control environment. This simulation environment has good data-gathering facilities, which allows the measurement of different aspects of objective team behaviour, including primary and secondary task performance, information sampling and system control behaviour. In addition, TM evaluations of the process of teamwork were measured (e.g., team climate). Finally, we have employed an experimental approach to compensate for the shortage of experimental research in the field of CRM training. Only an experimental approach with randomly assigning participants to CRM training or a control condition and then measuring an outcome can provide evidence as to whether CRM training is *causally* responsible for differences in the outcome.

In sum, the following predictions were made: (1) Congruent teams would show better performance than incongruent teams, with secondary tasks being more sensitive for this effect than primary tasks. (2) CST would have a positive effect on team performance, with secondary tasks being more sensitive for this effect than primary tasks. (3) CST would improve performance more strongly for incongruent teams than for congruent teams with secondary tasks being more sensitive for this effect than primary tasks.

2. Method

2.1 Participants

Participants were 64 males (age: $M = 20.7$, $SD = 2.15$, range: 18 – 29), recruited at different technical universities (in the French speaking part of Switzerland) to ensure that they had a comparable understanding of complex technical systems. Half of the participants were majoring in computer science while the others pursued degrees in different natural sciences (e.g., physics, chemistry, biology, medicine). Participants were paid 50 Swiss francs (approx. €35) for their participation.

2.2 Overview of procedure

The study was a 2 (CST: with vs. without) by 2 (competence / hierarchical status: congruent vs. incongruent) between-subjects design. The level of analysis was the team, consisting of 2 TMs who did not know each other. CST involved random assignment of the teams to either the training or control condition. High and low status roles within teams were randomly assigned. In half of the teams (random assignment) the leaders were made competent (congruent teams) whereas in the other half of the teams the assistants were made competent (incongruent teams) by providing a special training session with specific technical knowledge that enables TMs to better manage certain system faults encountered in the testing session.

After arriving in the lab, participants were told that the main goal of the study was to investigate how people work together in teams managing complex technical systems. Each participant signed an informed consent form. Participants were then given *technical training* on the CAMS environment (see below for details). Training took place in groups of 6 to 12 and was given by three instructors, with each of them being specialized in particular aspects of the training program. After the technical CAMS training (totalling 120 min), participants were given some light lunch during a 60-min break. After lunch, participants were paired in 2-person teams, with TMs being randomly assigned to either the high or low status position (leader and assistant). Half of the teams were then randomly assigned to *CST* or the control condition (see below for details on CST and the control condition).

Participants then received an additional training on CAMS (lasting 15 min) to create different levels of competence (high and low). This training was introduced to participants (with and without CST) as the '*CAMS refresher course'* (described in more detail below). TMs were randomly assigned to either the high or low-competence condition.

The *testing session* (described in more detail below) started with reinforcing the status roles allocated to the TMs (leader and assistant). The leader was given the ultimate decision-making responsibility and was told that he would evaluate the assistant's performance after the testing session. The assistant was told to follow the leader's instructions and support him. All of these status manipulations have been successfully used in other research (Galinsky *et al.* 2003, Schmid Mast *et al.* 2008, Schmid Mast and Hall 2003). The TMs' respective roles were reinforced by various status symbols. Both were given badges indicating their roles. The leader was seated on a large comfortable chair whereas the assistant was given a rather basic plastic chair, another power manipulation that has previously been used successfully (Chen *et al.* 2001). Furthermore, the leader was given control over the mouse and the keyboard, again to emphasise the status difference by giving higher control to the leader (a concurrent control of the system by both TMs was not possible due to constraints of the simulation environment).

Each team worked on a separate PC (3 to 6 teams per session, supervised by up to three experimenters), with teams being placed at separate tables at a distance of approximately 2 m from each other. They were instructed to speak softly to ensure that within-team communication would not disturb other teams. After the 60-min testing session, participants were asked to fill in questionnaires that were used for manipulation checks and contained self-ratings of teamwork (see below). Finally, they were debriefed and thanked for their participation. The procedure is summarised in figure 1.

2.3 Task environment: CAMS

The task environment, called CAMS (Cabin Air Management System), models a highly automated process control environment using the operational context of a spacecraft's life support system. As it has been described in detail elsewhere (e.g., Sauer *et al.* 2000), only a brief summary is given here.

The CAMS environment consists of five automatic controllers that maintain their corresponding system parameters (O_2, CO_2, cabin pressure, temperature, and humidity) within a predefined target state. The parameters refer to subsystems that are closely coupled and have hence an effect on each other during system operation. During normal system operation, the operator monitors the performance of the

automatic controllers and only intervenes in the event of a system fault (e.g. cooler failure, O_2 leak). *Figure 2* shows the main interface of CAMS, which provides feedback about the operation of various system components. Flow meters indicate the flow of O_2 and N_2 at several locations in the system. The icon of the mixer valve rotates when either gas is flowing. The operation of the various subsystems (e.g. cooler, dehumidifier) is indicated by various symbols. Finally, the warning system issues an alarm if any of the parameters moves out of its safe range.

The screen manager enables the operator to call up various displays and control panels. The history display provides the operator with graphical information about changes in the levels of parameter over the last 4 min. The maintenance facility allows the operator to repair any system fault, with each repair being completed within approximately 60 s. Since no explicit feedback is provided to whether the diagnosis was correct, the operator needs to check whether the fault state has actually been rectified.

There are four typical process control tasks that are to be carried out by the operator. These are divided into primary and secondary tasks according to their priorities for overall system integrity. (a) *System stabilization*: The first primary task was to maintain a stable system state at all times. This was achieved by monitoring the safe functioning of the automatic controllers and by adopting manual system control if required. (b) *Fault diagnosis*: The second primary task was to identify and repair any emerging system fault. (c) *Alarm acknowledgement*: The first secondary task was to acknowledge any system alarm, which involved clicking on a warning signal as soon as it was displayed. This task provided a measure of reaction time. (d) *Tank level recording*: The other secondary task was to keep a record of O_2 tank levels by regularly checking current levels (i.e., at 3-minute intervals). This corresponds to a time-based prospective memory task (i.e., to remember to complete an action at a specified time in the future).

CAMS is an appropriate simulation environment for teamwork. Although CAMS can also be operated by a single operator (because it is not a distributed system), it provides the possibility for task division between TMs which can only be successfully achieved by means of regular within-team communication. In this way, CAMS is similar to other technical systems, in which CST is used. For example, the task of flying in civil aviation is typically carried out by a team of two pilots, in an emergency the task could also be carried out by a single pilot (e.g., if the co-pilot is incapacitated), though this would clearly be at the cost of excessive workload and, possibly, impaired performance. The suitability of CAMS as a team task has also been demonstrated in a previous study (Sauer *et al.* 2006). Furthermore, previous work has also demonstrated that in a variety of different sub-optimal working conditions (e.g., noise, night work), CAMS proved to be a sufficiently sensitive simulation environment (e.g. Hockey *et al.* 2007, Sauer *et al.* 2003).

2.3.1 Technical training on CAMS

The basic technical training consisted of two phases. In the first phase (lasting about 60 min), participants received a general introduction to the operation of CAMS, using a mixture of PowerPoint presentations and practical exercises. This allowed participants to familiarize themselves with the CAMS environment so that they were able to carry out all four tasks (system stabilization, fault diagnosis, alarm acknowledgement, and tank level recording) and to operate the technical system in a fault free mode. In the second phase (also lasting about 60 min), participants were

trained on two standard system faults ("Leak in O_2 valve" and "CO_2 scrubber ineffective"). The instructor went through a step-by-step procedure to teach the participant how each fault can be diagnosed and repaired (i.e., which symptoms correspond to each fault) and how the system state is stabilized most efficiently after the onset of the system fault. In a further training trial, they were asked to manage these two system faults independently, with the instructor being available for questions. To verify whether CAMS training was effective in equipping the trainees with the necessary skills, participants had to manage the leak in O_2 valve by themselves, an activity in which all participants succeeded.

2.3.2 Inducing task competence ('refresher course')

The refresher course served the purpose of making specific TMs more competent and others less competent. Participants in the competent condition were trained on a complex fault (N_2 valve stuck open). Participants were told that this fault could not be repaired and that a control panel was blocked. Furthermore, it was pointed that other control panels had to be used to stabilize the system. Finally, participants were given some practice on managing the system fault. This complex fault represented a different class of faults (i.e., it was not repairable and contained a concurrent failure of the most needed control panel). Being taught how to manage this fault took participants to a new level of system understanding. Participants in the low-competence condition were trained on another standard fault (leak in mixer valve), which did not help them manage more efficiently the faults they were going to encounter in the testing session.

2.3.3 Testing session

The 60-min testing session consisted of a series of four fault scenarios that were presented in the following order: leak in O_2 valve (standard fault), N_2 valve stuck open (complex fault), dehumidifier set point failure (standard fault), and cooler failure (complex fault). The faults lasted between 11 and 20 min, depending on the type of fault. At the end of each fault state, the system was reset (i.e., all parameters were stabilized) to avoid after-effects of previous unsuccessfully managed fault states. Between to fault states, fault free phases were set up to include periods of low workload (lasting about 1 min).

2.4 CRM training: Communication skills training

CST started with a 4-min film scene from the National Geographic documentary series "Seconds from Disaster" entitled "The Crash of the Century: Collisions on the Runway". This film shows a tragic accident in aviation, which was due to ineffective communication between the captain and his co-pilot. Participants watched the film and were asked (a) to reflect on the attitudes of the captain and the co-pilot and the consequences, (b) to identify effective and ineffective communication patterns, and (c) to suggest how communication patterns could be improved. Each participant was instructed to give his opinion according to the previous assigned status role (i.e., assistants answered questions relating to the co-pilot while leaders responded to the questions concerning the captain).

Participants then received further information about how communication can be more effective. The focus was put on two communication elements: influencing skills and receptiveness.

In the final part of CST, participants took part in a role-play in which they were already assigned the role they were going to adopt in the subsequent experiment (i.e., leader or assistant). The purpose of the role-play was to give the participants actual experience in within-team communication to deal with difficult group processes. Participants received feedback from the experimenter about their performance in the role play. The training concluded with a short summary of the main points of CST.

The teams that did not receive CST watched and discussed a documentary instead ("Sur les routes d'Ushuaïa, Protéger les Paradis Terrestres: Retour à North Grip"). The documentary was about climate research in Greenland and completely unrelated to the topic of communication skills. After watching the documentary, participants completed a questionnaire about its content (e.g., "What measures would you suggest to reduce CO_2 emission?"). The responses to the questions were then discussed in the group. This procedure ensured that the TMs without CST were equally familiar with each other as in the CST condition. This control condition was important because if we were to find an effect of CST on any of the outcome variables, this effect could not be explained by TMs just knowing each other better or having communicated with each other more but by the specific aspects of CST.

2.5 Measures

2.5.1 Performance measures

Four performance measures were collected by the CAMS environment. The first two were defined as primary tasks, the last two as secondary tasks (with participants being instructed about the difference in their priorities). (a) *System stabilization errors*: Sum of the duration (in s) in which the control parameters are out of their target range. (b) *Diagnostic errors*: Number of incorrect diagnoses per fault state. (c) *Alarm reaction time*: Time elapsed (in s) until a system alarm was acknowledged by clicking on a warning signal. (d) *Prospective memory errors*: Percentage of O_2 tank level recordings being missed. Furthermore, *information sampling behaviour* (how many times the flow rates were checked per min) and *system management* strategies (number of attempts to repair a system fault that is not repairable) were measured.

2.5.2 Subjective state measures

Three subjective state measures were taken. We measured self-rated *mental effort* expenditure with 1 item on a scale ranging from 0 (not at all) to 100 (a great deal) (M = 45.89, SD = 23.72). Self-rated *anxiety* was assessed with 1 item on a scale ranging from 0 (not at all) to 100 (a great deal) (M = 31.38, SD = 24.80). Finally, we measured self-rated *fatigue* with 1 item on a scale ranging from 0 (not at all) to 100 (a great deal) (M = 41.05, SD = 23.70). The three subjective state measures were derived from the NASA TLX (Hart and Staveland, 1998) and has already been employed in a considerable number of studies (e.g., Hockey et al. 1998; Hockey et al. 2007).

2.5.3 Questionnaire scales

2.5.2.1 Self-rated team performance. We measured self-rated team performance with 4 items (2 reverse scored) on a 5-point Likert format scale ranging from 1 (I strongly

disagree) to 5 (I strongly agree). A sample item was: “As a team we showed good task performance”. Items were averaged and larger number indicate higher self-rated team performance (M = 4.48, SD = 0.52, Cronbach’s alpha = .79). The scale was purpose-built for this study.

2.5.2.2 Self-rated team involvement. We measured self-rated team involvement with 4 items (2 reverse scored) on a 5-point Likert format scale ranging from 1 (I strongly disagree) to 5 (I strongly agree). A sample item was: “I did not put much effort into the task”. Items were averaged and larger number indicate higher self-rated team involvement (M = 4.52, SD = 0.45, Cronbach’s alpha = .73). The scale was also purpose-built for this study.

2.6 Manipulation checks

2.6.1 Assigned status roles

To check whether the person in the assigned high status role really had more influence in the within-team interaction than the person in the assigned low status role, we measured the self-reported influence that each TM had on the decision of the group with 1 item (“How do you judge your influence on the group decision in comparison with your team mate?”) on a scale from 1 (team mate’s influence was much bigger) to 5 (my influence was much bigger). This scale was developed for a previous study, which addressed the issue of team performance (Sauer et al. 2006).

To check whether both roles assigned were equally attractive to participants, we measured self-reported role liking with four items (two reverse scored). Sample items are “I liked my role” or “I had difficulty in accepting my role” (reverse scored). The four items were averaged (M = 3.98, SD = 0.89, Cronbach’s alpha = .88). As predicted, we found that the person in the role of the leader (M = 3.81) felt more influential in decisions of the team than the person in the assistant’s role (M = 3.13), $t(31) = 3.57$, $p = .001$. Also as expected, participants did not differ in how much they liked their assigned roles (M_{leader} = 4.04, $M_{assistant}$ = 3.92), $t(31) = 0.48$, $p = .64$. This scale was developed for a previous study on leader incompetence (Darioly & Schmid Mast, 2009).

2.6.2 Task competence

To check whether the people who were trained on the complex fault (the competent ones) felt more competent during the interaction than the people who were not trained (the less competent ones), we assessed felt competence with one item (“How do you judge your knowledge about the simulation in comparison with your team mate?”) on a scale from 1 (my team mate’s knowledge was much bigger) to 5 (my knowledge was much bigger). We predicted and found that the more competent participants (M = 3.19) reported to have more knowledge about CAMS than the less competent participants (M = 2.94), $t(62) = 2.21$, $p = .031$. This scale was developed for a previous study on team performance (Sauer et al. 2006).

2.6.3 Team collaboration

To check whether the CST teams perceived their collaboration to be better than teams without CST, each participant judged the quality of the collaboration with one item

("Our collaboration was good") on a scale from 1 (I strongly disagree) to 5 (I strongly agree). TM ratings were averaged. We predicted and found that the teams who participated in CST perceived their team to collaborate better (M = 4.97) than teams who did not participate in CST (M = 4.63), $t(30) = 2.02$, $p = .05$. Again, this scale originates from a previous study on team performance (Sauer et al. 2006).

3. Results

To test our hypotheses about performance using team-based data, we computed a 2 (with or without CST) by 2 (congruent vs. incongruent teams) ANOVA for each of the performance variables separately. For the analysis of questionnaire data of individual TMs, we performed the same ANOVA as for the performance measures but added status as a third factor (leader vs. assistant) to the ANOVA model, with status being a repeated measures factor.

3.1 CAMS performance measures

3.1.1 System stabilization errors

An analysis of the time during which system parameters were out of their target range showed no effects between experimental conditions (M_{grand} = 176 s). There was no significant main effect for congruence, $F(1,28) = 0.47$, $p = .501$, and none for CST, $F(1,28) = 0.87$, $p = .359$. There was no significant interaction, $F(1,28) = 0.86$, $p = .361$.

3.1.2 Diagnostic errors

With respect to the number of incorrect fault diagnoses per system fault (M_{grand} = .49), there was no significant main effect for congruence, $F(1,28) = 0.67$, $p = .421$, and none for CST, $F(1,28) = 0.00$, $p = 1.00$. The interaction effect was also not significant, $F(1,28) = 2.67$, $p = .114$.

3.1.3 Alarm reaction time

In terms of time elapsed until a system alarm was acknowledged, there was no significant main effect for congruence (M_{grand} = 1.83 s), $F(1,28) = 1.78$, $p = .193$, and none for CST, $F(1,28) = 0.84$, $p = .367$. The interaction effect was also not significant, $F(1,28) = .17$, $p = .680$.

3.1.4 Prospective memory errors

The analysis revealed that congruent teams (M = 3.63) missed fewer tank level recordings than incongruent teams (M = 11.19), $F(1,28) = 13.02$, $p = .001$, effect size $r = .56$. There was no significant main effect for CST, $F(1,28) = 0.62$, $p = .439$, but a significant interaction effect, $F(1,28) = 5.55$, $p = .026$, effect size $r = .56$, for which the means of each condition are shown in *Figure 3*. The results indicate that the incongruent teams benefited from CST whereas the congruent teams did not.

3.1.5 Information sampling

Examining the number of flow meter viewings showed that incongruent teams (M = 5.44) sampled the flow rates more frequently than the congruent teams (M = 2.09), $F(1,28) = 9.31$, $p = .005$, effect size $r = .50$. There was no significant main effect for CST, $F(1,28) = 0.45$, $p = .507$, and no significant interaction effect, $F(1,28) = 0.04$, $p = .846$.

3.2 CAMS subjective state measures

We performed the same ANOVA as for the performance measures. However, we added status as a third factor (high or low status) to the ANOVA model, with status being a repeated measures factor.

3.2.1 Mental effort

The results showed that TMs in high power positions reported having expended more effort into the task activities (M = 50.00) than TMs in low power positions (M = 41.78), $F(1,28) = 4.22$, $p = .049$. There was no significant main effect for congruence, $F(1,28) = 1.34$, $p = .256$, and none for CST, $F(1,28) = 0.19$, $p = .664$. None of the interaction effects was significant (all F's < 1.39, all p's > .248).

3.2.2 Anxiety

The results showed that incongruent teams (M = 39.41) were more anxious than congruent teams (M = 23.34) $F(1,28) = 6.37$, $p = .018$. There was no significant main effect for CST, $F(1,28) = 0.16$, $p = .69$, and no significant main effect of status, $F(1,28) = 2.42$, $p = .131$. None of the interaction effects was significant (all F's < 1.41, all p's > .245).

3.2.3 Fatigue

TMs in low status positions felt more fatigued (M = 47.44) than TMs in high status positions (M = 34.66) $F(1,28) = 4.92$, $p = .035$. There was no significant main effect for congruence, $F(1,28) = 0.29$, $p = .592$, and none for CST, $F(1,28) = 0.60$, $p = .446$. None of the interaction effects was significant (all F's < 2.06, all p's > .162).

3.3 Questionnaire scales

3.3.1 Self-rated team performance

Teams with CST rated their performance higher (M = 4.69) than teams without CST (M = 4.26), $F(1,28) = 7.87$, $p = .009$, effect size $r = .47$. There was no significant main effect for congruence, $F(1,28) = 0.11$, $p = .746$, and none for status, $F(1,28) = 0.71$, $p = .407$. None of the interaction effects was significant (all F's < 1.39, all p's > .248).

3.3.2 Self-rated team involvement

Teams with CST rated their team involvement marginally significantly higher (M = 4.59) than teams without CST (M = 4.38), $F(1,28) = 3.46$, $p = .074$, effect size $r = .33$.

There was no significant main effect for congruence, $F(1,28) = 0.49$, $p = .491$, and none for status, $F(1,28) = 0.93$, $p = .344$. None of the interaction effects was significant (all F's < 1.63, all p's > .212).

4. Discussion

The goal of the present study was to investigate how teams in which the status hierarchy matched the task-competence hierarchy or not performed on different performance levels and whether communication skills training attenuated the expected negative effect of mismatched teams. The results showed that on a few tasks, performance was better for congruent in comparison to incongruent teams and for one task, CST was beneficial specifically for incongruent teams. Therefore, our hypotheses were only partially supported. In other words, when we found effects, they went in the predicted direction but it also became clear that we only found few effects.

Looking at the task performance level at which these effects emerged, it became evident that the congruent teams had an advantage over the incongruent ones for one of the task management strategies (i.e., more effective flow meter sampling) and for one of the CAMS subjective state measures (i.e. congruent teams were less anxious) but not for any of the main performance measures. Also, CST improved team performance only observed for self-reported performance while objective performance measures remained largely unaffected. CST moderated the relation between team congruity and team performance for one specific variable (prospective memory errors), suggesting that if an effect was observed, CST was generally found to be more beneficial for incongruent teams than for congruent teams. A summary of the findings is provided in Table 1.

We predicted that in incongruent teams, there would be more negative outcomes (notably decreased performance) than in congruent teams. Although the non-optimal team composition did not lead to dramatic performance decrements, it still affected some performance aspects, especially for non-optimal teams without CST. This suggests that even in the absence of CST, teams were well able to maintain primary task performance under non-optimal team composition. However, this maintenance of primary task performance may come at a cost, as suggested by the model of compensatory control (Hockey 1997). This was observed in the form of decrements in secondary task performance on the prospective memory task due to a shift in resources from secondary tasks to primary tasks to maintain overall performance levels.

In addition to the secondary task performance impairment, further evidence for the problems ensuing from an ill-matching team composition also stemmed from flow meter sampling behaviour. Incongruent teams sampled the flow meter more often than necessary, which may be due to the greater ambiguity of their roles. Since our incongruent teams were composed of a less competent leader and a more competent assistant, we cannot know whether the performance decrement was due to the less competent leader or to the more competent assistant or to both. Expectation States Theory suggests that the leader is in a high status position that may be considered illegitimate. This may have put strain on him, resulting in performance decrements. However, the illegitimacy might also make the leader wanting to compensate for his lack of competence by increasing effort in simple activities (e.g., flow meter reading). On the other hand, it is also possible that the competent assistant is responsible for the results found. He might have felt reluctant to demonstrate his competence, which he might have perceived as overstepping his role. This might have entailed the

performance decrement and he might have diverted his efforts to a relatively insignificant activity such as checking the flow meters. Future research needs to address this point and disentangle completely the competence and status positions by also examining teams with competent leaders and competent assistants as well as teams with low-competence leaders and low-competence assistants.

For the variables that were assessed for leaders and assistants separately, we were able to look at whether there were status differences. We found that the team leaders reported to having expended more mental effort into the task than assistants and that assistants felt more fatigued than leaders. These findings are in line with the high status and low status roles, with the leader being ultimately responsible for task completion. Therefore, there is more at stake for the leader, which may explain his higher expenditure of mental effort. The increased fatigue experienced by assistants was also not surprising because his role was clearly less interesting. The manipulation of the mouse, for instance, was a responsibility assigned to the leader, which may have caused the assistant to feel less involved at times. Previous research has also indicated that assigning a (even minor) functional role to one TM (e.g., being in charge of making system interventions by mouse and keyboard) has resulted in increases in subjectively experienced operator strain, which became evident in measures such as effort, anxiety and fatigue (Sauer *et al*. 2006).

The lack of strong evidence for the benefits of receptiveness and influencing skills may be due to the general difficulties of demonstrating the effectiveness of training methods at the behavioural level while evidence at the levels of reaction and learning was easier to observe. Overall, the present study seems to confirm the overall pattern that emerged from the two literature reviews (Salas *et al.* 2001, 2006), showing that the further you move down the levels of Kirkpatrick's classification scheme, the less strong the evidence for the effectiveness of receptiveness and influencing skills becomes. This became evident at the first level (subjective reactions to training) which showed that self-rated team involvement was perceived to be more positive in teams with CST as compared to teams without CST. At the second level (learning), we also found benefits for CST, with CST teams considering themselves as better performers than the control group. At the third level (behaviour), it emerged that primary task performance did not benefit from CST. However, CST buffered the performance decrements on secondary tasks that were recorded for unfavourable team compositions (i.e., incongruent teams): Incongruent teams with CST were better at recording O_2 tank levels throughout the testing session than those without CST. This effect was not found for congruent teams. This finding may be interpreted within Hockey's (1997) model of compensatory control. It assumes that under unfavourable working conditions (here: incongruent teams), performance decrements may be expected but these decrements are rarely observed on primary tasks but are more likely to emerge in secondary tasks, since these are more sensitive to variations in workload. Since receptiveness and influencing skills provided the basis for more effective within-team communication in the incongruent teams, this allowed for more cognitive resources to be committed to task completion with the incongruent CST teams (compared to incongruent teams without CST). This led to improvements in performance for the prospective memory task which is characterized by considerable demands on working memory. CST appears to be most beneficial in situations for which it was originally designed such as sub-optimal team composition. The non-task skills taught by CST were of greater benefit under these latter circumstances. Future research may wish to examine whether this observation extends to other sub-optimal working conditions that impinge on the quality of team collaboration in a more

indirect way (e.g., time pressure, noise). These sub-optimal working conditions also put strain on the team, which might then be alleviated by CST because it allows for a more flexible adaptation of within-team system management strategies (e.g., high noise levels may require the shift to a cognitively less demanding system management strategy). A further step would be to identify the most important elements of CST and to focus on these and possibly place less emphasis on elements that were not found to be strongly related to performance.

The study entails a number of limitations, which are largely owed to the constraints of carrying out lab-based experimental research. First, the current sample has a lower level of technical expertise than recipients of real CRM training in the field, who tend to be subject matter experts. This represents an inherent problem of using an experimental approach that aims to manipulate task competence. Novices were selected as participants and appropriately trained because the task competence manipulation would not have been feasible with subject matter experts. Since the level of task competence used in a study is not only a function of training time but also a function of system complexity (which was much lower in the present case than for technical systems typically used for CRM training), the present experimental set-up is considered to represent an acceptable lab-based simulation of a real work environment.

Second, the time allocated to CST was rather short, again owing to budgetary and time constraints of the study. This also required focusing on selected elements of CRM training rather than modelling the full CRM training programme. Therefore, two elements of CRM training (receptiveness and influencing skills) were employed in the present study. Although we do not have any independent means to test the degree to which these two elements are related to performance, we believe that due to the complex nature of the task environment, incongruent teams need to communicate to make best use of their team resources. Without communication, the low-competence leader would need to complete the task alone since the competent assistant would have no means of contributing to team performance, as he did not have access to any of the controls. Therefore, we strongly endorse that receptiveness and influencing skills were of benefit in the present study since both improved the quality of within-team communication. Please note that in the present study, we cannot tell whether it was more the receptiveness or the influencing skill aspect of CST that drove the effect.

Third, one can question the overall ecological validity of the lab-based experiment. However, the advantage of using an experimental approach (albeit lacking ecological validity by definition) is that it makes it possible to test causal influences. Given that much of the exiting literature in this field is correlational, we think that there is some merit in employing an experimental approach.

With regard to the implications for the design of CRM training in industry, it has to be taken into consideration that the current study employed a low-fidelity simulation for generic task environment, for which the implications for industry are naturally more limited than in studies using a high-fidelity simulator modelling a specific technical system. However, for training programs in CRM one may envisage to go beyond the identification of behavioural markers (as it is done in most application domains; Flin *et al.* 2008) by also making use of objective performance measures (e.g., fault rectification time). These are the ultimate performance parameters that one wishes to influences by training. Finally, CRM training programmes may also need to inform participants about the possible moderating effects that team composition may have on the effectiveness of CRM training.

Against the background of the findings of the present study, the points made by Salas *et al*. (2001, 2006) can only be reiterated. There is a need for further multi-level analyses and also for more experimental work that allows us to look more closely at specific elements of CRM training and identify those that seem to be critical for team performance. The findings of the present study point to the need for a multi-level analysis in the sense of Kirkpatrick's (1976). In future multi-level analysis of CRM training, behaviour may need to be measured by using several parameters, including resource-sensitive secondary tasks. This reiterates the point that an appropriate methodological approach has to be chosen (e.g., using a multiple-task environment) to pick up and understand the multiple effects of CRM training. While the cause for the lack of strong evidence for the benefits of training receptiveness and influencing skills could not be determined (methodological limitations vs. non-optimal design of CRM training), the work presented has some merit by providing a good example of the methodological principles that should guide an evaluation of CRM training. It demonstrates that an experimental approach can be used to examine the effects of CRM training in a lab setting before the transferability of CRM training to a work setting is tested.

References

Bass, B. M., 1990. *Bass & Stogdill's handbook of leadership: Theory, research, and managerial applications (3rd ed.). New York: Free Press*

Berger, J., *et al.*, 1977. *Status characteristics and social interaction: An expectation states approach*. New York: Elsevier.

Chen, S., Lee-Chai, A.Y., and Bargh, J.A., 2001. Relationship orientation as a moderator of the effects of social power. *Journal of Personality & Social Psychology*, 80 (2), 173-187.

Cohen, B.P. and Lee, H., 1975. *Conflict, conformity and social status*. Amsterdam: Elsevier.

Darioly, A. and Schmid Mast, M., in press. Facing in incompetent leader: The effects of a non-expert leader on subordinates' perception and behavior. *European Journal of Work and Organizational Psychology*.

Droog, A., 2004. The current status of CRM training and its regulations in Europe. *In:* K.M. Goeters, ed., *Aviation Psychology: Practice and Research.* Aldershot: Ashgate Publishing Limited, 221-230.

Dunlap, J.H. and Mangold, S.J., 1998. Leadership/followership recurrent training: student manual. Federal Aviation Administration (AAR-100), Washington DC 20951.

Falk, I., 1999. Situated Leadership: A new community leadership model. Chapter in Rural Community Partnerships: Education for the 21st Century. *Proceedings of*

the National Rural Education Conference of the Country Education Project. Held at School of Mines, Ballarat Oct 1-3 1998. Country Education Project.

Flin, R., O'Connor, P., and Crichton, M., 2008. *Safety at the sharp end. A Guide to Non-Technical Skills*. Aldershot: Ashgate.

Galinsky, A.D., Gruenfeld, D.H., and Magee, J.C., 2003. From power to action. *Journal of Personality and Social Psychology,* 85 (3), 453-466.

Ginnett, R.C., 1993. Crews as groups: their formation and their leadership. *In:* E.L. Wiener, B.G. Kanki, and R.L. Helmreich, eds., *Cockpit Resource Management.* Orlando, FL: Academic Press, 71-98.

Hamblin, R.L., Miller, K., and Wiggins, J.A., 1961. Group morale and competence of the leader. *Sociometry*, 24 (3), 295-311.

Hart, S. G. and Staveland, L. E., 1988. Development of NASA-TLX (Task Load Index): Results of empirical and theoretical research. In P. A. Hancock, and N. Meshkati (Eds.), *Human mental workload* (pp. 139-183). Amsterdam: North-Holland.

Hockey, G.R.J., 1997. Compensatory control in the regulation of human performance under stress and high workload: a cognitive-energetical framework. *Biological Psychology*, 45 (1-3), 73-93.

Hockey, G.R.J., Sauer, J., and Wastell, D.G., 2007. Adaptability of training in simulated process control: comparison of knowledge- and rule-based guidance under task changes and environmental stress. *Human Factors*, 49 (1), 158-174.

Hockey, G.R.J., Wastell, D., and Sauer, J., 1998. Effects of sleep deprivation and user interface on complex performance: a multilevel analysis of compensatory control. *Human Factors, 40,* 233-253.

Katz, D. and Kahn, R., 1952. Some recent findings in human relations research in industry. *In:* G. Swanson, T. Newcomb, and E. Hartley, eds., *Readings in Social Psychology.* New York: Holt, 295-311.

Kirkpatrick, D.L., 1976. Evaluation of training. *In:* R.L. Craig, ed., *Training and Development Handbook: A Guide to Human Resource Development*. New York: McGraw-Hill, 301-319.

Littlepage, G.E., 1991. Effects of group size and task characteristics on group performance: a test of Steiner's model. *Personality and Social Psychology Bulletin*, 17 (4), 449-456.

Pearce, C., L. and Sims, H., P., Jr., 2002. Vertical versus shared leadership as predictors of the effectiveness of change management teams: An examination of aversive, directive, transactional, transformational, and empowering leader behaviors. *Group Dynamics: Theory, Research, & Practice, 6*, 172-197.

Perry, M. L., Pearce, C. L., and Sims Jr, H. P., 1999. Empowered selling teams: How shared leadership can contribute to selling team outcomes. *Journal of Personal Selling & Sales Management, 19*(3), 35-51.

Salam, S., 1998. The effects of subordinate competence, leader competence, leader integrity, and technology on subordinate participation seeking, performance, satisfaction, and agreement. *Dissertation Abstracts International Section A: Humanities and Social Sciences,* 59.

Salas, E., Rhodenizer L., and Bowers C.A., 2000. The design and delivery of crew resource management training: exploiting available resources. *Human Factors,* 42 (3), 490-511.

Salas, E., *et al.*, 2001. Team training in the skies: does crew resource management (CRM) training work? *Human Factors,* 43 (4), 641-674.

Salas, E., *et al.*, 2006. Does crew resource management training work? An update, an extension, and some critical needs. *Human Factors,* 48 (2), 392-412.

Sauer, J., Wastell, D.G., and Hockey, G.R.J., 2000. A conceptual framework for designing micro-worlds for complex work domains: a case study of the Cabin Air Management System. *Computers in Human Behavior,* 16 (1), 45-58.

Sauer, J., *et al.*, 2003. Performance in a complex multiple-task environment: Effects of occasional night work and extended task involvement. *Human Factors,* 45 (4), 657-669.

Sauer, J., *et al.*, 2006. Cognitive diversity and team performance in a complex multiple task environment. *Ergonomics, 4*9 (10), 934-954.

Schmid Mast, M. and Hall, J.A., 2003. Anybody can be a boss but only certain people make good subordinates: Behavioral impacts of striving for dominance and dominance aversion. *Journal of Personality,* 71 (5), 871-891.

Schmid Mast, M., Jonas, K., and Hall, J.A., 2008. Give a person power and he/she will show interpersonal sensitivity – The phenomenon and its why and when. *Manuscript submitted for publication.*

Steiner, I.D., 1972. *Group Processes and Productivity*. New York: Academic Press.

Turner, J.C. and Brown, R.J., 1978. Social status, cognitive and intergroup relations. *In:* H. Tajfel, ed., *Differentiation Between Social Groups.* London: Academic Press, 201-234.

Wehr, P., Burgess, H., and Burgess, G.M., eds., 1994. *Justice Without Violence*. Boulder and London: Lynne Rienner Publishers.

Tables

Table 1. Effects of communication skills training (CST), Team Congruence, and Status Hierarchy.

Variable	CST effect	Congruence effect	Status effect
CAMS performance measures			
System stabilization errors	=	=	n.a.
Diagnostic errors	=	=	n.a.
Alarm reaction time	=	=	n.a.
Prospective memory errors*	=	congr < incongr	n.a.
Information sampling	=	congr < incongr	n.a.
System management	with > without	=	n.a.
CAMS subjective state measures			
Mental effort	=	=	high > low
Anxiety	=	congr < incongr	=
Fatigue	=	=	high < low
Questionnaire			
Self-rated team performance	with > without	=	=
Self-rated team involvement	with > without	=	=

Note. n.a.: not applicable (because we only have team level data and did not separate measures for leaders and assistants). * indicates the only variable with an interaction effect, which is depicted in *Figure 2*. = means no difference between the groups, with: with CST, without: without CST; congr: congruent teams, incongr: incongruent teams.

Figure Captions

Figure 1: Experimental procedure (totalling about 7 hours including breaks)

Figure 2: Main interface of CAMS environment

Figure 3: Prospective memory failures as a function of crew resource management training and team congruence

Figure 1

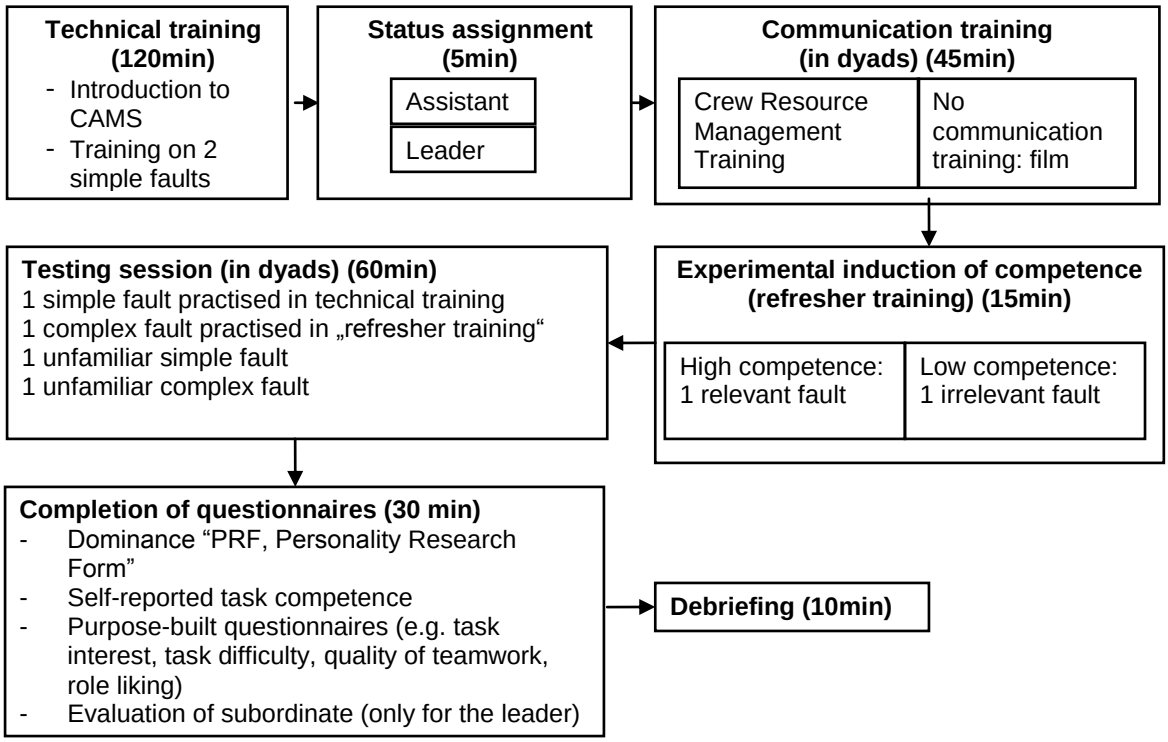

Technical training (120min)
- Introduction to CAMS
- Training on 2 simple faults
Status assignment (5min)
Assistant
Leader
Communication training (in dyads) (45min)
Crew Resource Management Training
No communication training: film
Experimental induction of competence (refresher training) (15min)
High competence: 1 relevant fault
Low competence: 1 irrelevant fault
Testing session (in dyads) (60min)
1 simple fault practised in technical training
1 complex fault practised in „refresher training“
1 unfamiliar simple fault
1 unfamiliar complex fault
Completion of questionnaires (30 min)
- Dominance “PRF, Personality Research Form”
- Self-reported task competence
- Purpose-built questionnaires (e.g. task interest, task difficulty, quality of teamwork, role liking)
- Evaluation of subordinate (only for the leader)
Debriefing (10min)

Figure 2

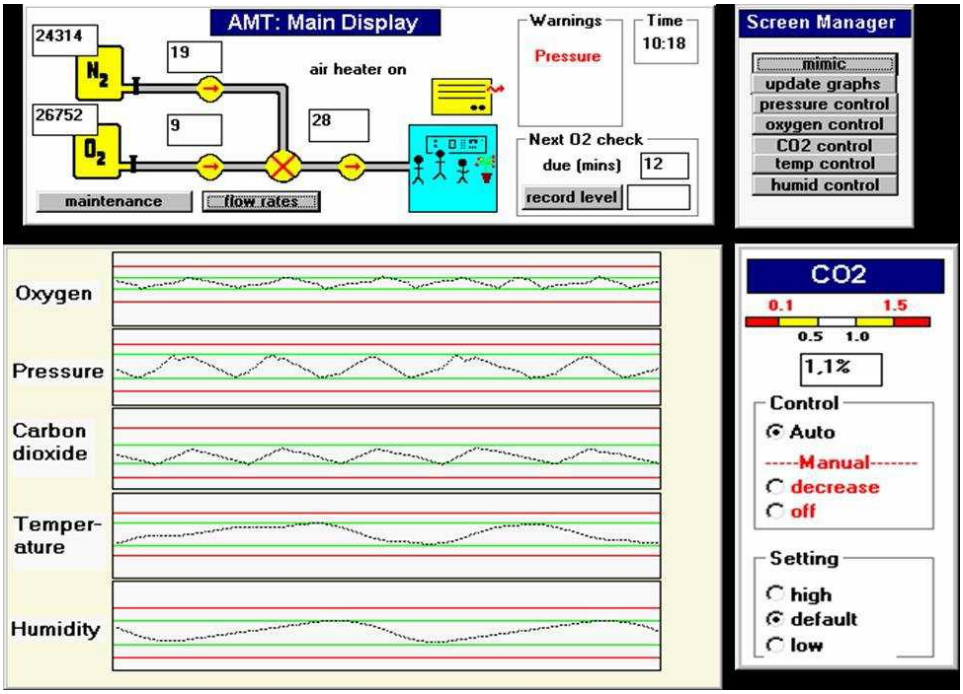
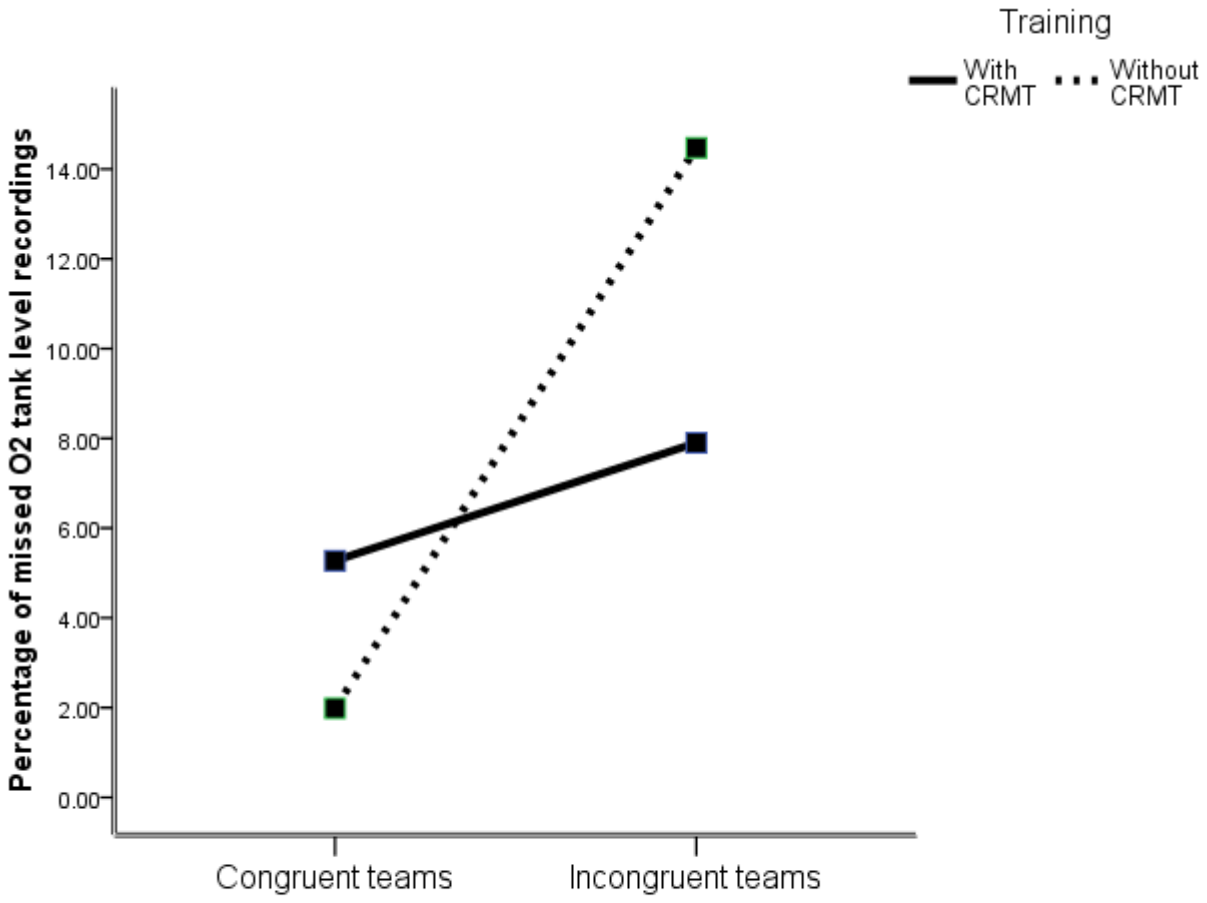

AMT: Main Display
24314
N2
19
air heater on
26752
O2
9
28
maintenance
flow rates
Warnings
Pressure
Time
10:18
Next 02 check
due (mins)
12
record level
Screen Manager
mimic
update graphs
pressure control
oxygen control
CO2 control
temp control
humid control
Oxygen
Pressure
Carbon dioxide
Temper-ature
Humidity
CO2
0.1
1.5
0.5
1.0
1.1%
Control
Auto
-----Manual------
decrease
off
Setting
high
default
low

Figure 3


Training
With CRMT
Without CRMT
Percentage of missed O2 tank level recordings
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Congruent teams
Incongruent teams