

Università della Svizzera italiana

Faculty of Economics

Institute of Management

# **Investigating Leadership Emergence using Longitudinal Leadership Networks**

Cécile Emery

Thesis submitted in total fulfillment of the requirements for the degree of  
Doctor of Philosophy in Management of the Università della Svizzera italiana,  
**April 2010.**

“A community is like a ship; everyone ought to be prepared to take the helm”

Henrik Ibsen

## ABSTRACT

A growing body of research has examined emergent leadership within groups. Emergent leadership is defined as a process during which some individuals, over time and through social interaction, are recognized and accepted as leaders by the group. Interestingly, although there is much theorizing about how leadership emerges and about the individual characteristics facilitating the emergence of leaders, there is still very little about knowledge about this particular dynamic social process, and this is especially true if we expand our view of leadership beyond the leader-follower dyad.

To refine our understanding of leadership emergence, I built my investigations on previous research on Distributed Leadership which recommends the use of social network analysis to study how leadership may be shared among several individuals. By envisioning leadership as a network of perceptions, where nodes and ties represent actors and leadership nominations respectively, a complex and multi-level representation of leadership is gathered. While social network analysis has been successfully applied to study distributed leadership using a cross-sectional approach, leadership emergence occurs over time and an analysis of this phenomenon would benefit from the use of a longitudinal perspective.

I therefore collected leadership networks over several periods of time and used SIENA, a novel multilevel statistical procedure for longitudinal analysis of social networks, to examine, through three manuscripts, (i) How emergent leaders are the result of group processes?, (ii) Do emergent leaders perceive themselves as leaders? and (iii) Are emergent leaders emotionally intelligent?

**Key words:** Leadership Emergence, Longitudinal Social Network Analysis

## ACKNOWLEDGEMENT

Many people deserve my deepest appreciation and thanks. I am especially grateful to my supervisors, Professors Erik Larsen and David Brinberg, who guided and advised me through the years. David, I still cannot believe that our initial project addressed such fascinating research questions and resulted in an amazing and fruitful collaboration. Thank you for your invitation to visit Virginia Tech, your hospitality, and your precious guidance.

I would like to thank my “USI Clique” and especially Professors Erik Larsen and Alessandro Lomi. Thank you for giving me the opportunity to undertake and complete a PhD at USI, supporting and guiding me throughout my research process, giving me the freedom to develop my own research agenda, recognizing my contribution to the emergence and success of our innovative, active, and growing research institute, introducing me to great scholars, providing me with the highest education in social network analysis one could expect, financially allowing me to attend many conferences, and challenging me to meet your standards in terms of research and publications. I hope by standing on your shoulders, I will do justice to USI’s management research program. Thanks must also certainly go to Professor Gianluca Carnabuci for his precious collaboration, Professor Tom Snijders for his enthusiasm in my research topic and suggestions in improving my models, all my PhD and Post-Doc fellows, Fabi, Franscesca, Francesco, Guido, Karthik, Lei, Min, Mohamed, and others, for discussing my research during our famous MORSe and for their support during troubled times, and Julien for his incredible friendship, concern and interest. I also would like to address my deepest appreciation to Professor Ann van Ackere, my long-term mentor who, since my undergraduate studies, encouraged me to follow an academic career and who supported my applications to LSE, USI, and Virginia Tech. Thank you for believing in me and for your constant support all over the years.

I would then like to thank my “VT Clique”. Kim, Anne: it was a real pleasure and a great experience working with you and I hope we will more occasions to work together! Thanks to Chris, Joe, and Nathan, engineers who agreed to read my essays and comment them. Thanks to Anne, Emily, and Derick for the ‘final push’. Finally, I would like to address my deepest thanks to Meghan. Thank you for making my experience at Virginia Tech so pleasant by introducing me to your friends, helping me around Blacksburg, sharing our passion for cooking, or, simply, being such a amazing friend. Thank you all for the great moments spent in Blacksburg.

I would like to acknowledge the support of the USI Research Commission and the Swiss National Science Foundation. To the participants, I am extremely grateful to you for your time, effort, and the richness of the information you have provided. I wish to acknowledge the precious and constructed feedback as well as the encouragements received from editors, anonymous reviewers, and conference participants.

On the non-academic side, the support of my family and friends kept me going. Thank you to my family for their constant encouragements and for looking after me. Special thanks to my Mum for reading my papers. Pauline, thank for the coaching and for being there when I needed it the most. Émilie, Laetitia, Lucy, Pénélope, and Sophie, je vous remercie du fond du cœur pour m’avoir toujours soutenue et pour votre incroyable amitié. Deborah, merci beaucoup pour le coup de pouce final. Ana, Tanya, I thank you for your friendship, support, and all the great times spent in Lugano.

Finally, and most of all, I wish to thank Paolo who has done so extraordinarily well at being supportive, loving, and understanding. You were my rock. I am now looking forward continuing my academic experiences with you by my side. Grazie per tutto.

# TABLE OF CONTENT

ABSTRACT.....	i
ACKNOWLEDGEMENT.....	ii
TABLE OF CONTENT.....	iv
CHAPTER 1 - INTRODUCTION .....	1
Methodological Contributions .....	3
From a “single-leader/dyadic” to a “multi-leaders/group” perspective .....	3
From a cross-sectional to longitudinal research design .....	5
Research Contributions.....	6
How emergent leaders are the result of group processes? A structural approach to leadership emergence .....	7
Do emergent leaders perceive themselves as leaders? Investigating the reciprocal effects of self-view as a leader and leadership emergence. ....	8
Are emergent leaders emotionally intelligent? Investigating the role of emotional abilities in leadership emergence. ....	8
Summary.....	9
CHAPTER 2 - LITERATURE REVIEW .....	10
Leader-Member Exchange.....	10
Structural Approaches .....	12
Distributed Leadership.....	14
Summary.....	16
CHAPTER 3 - METHODOLOGY & DATA .....	17
Why model social networks? .....	17
Model for longitudinal network analysis.....	18
Exponential random graphs .....	23

Sample & Measures.....	26
Summary.....	32
CHAPTER 4 - EMERGENT LEADERS: RESULT FROM A GROUP PROCESS? .....	33
Introduction.....	33
Theoretical Background.....	37
Dyadic Level: Asymmetry	39
Triadic Level: Transitivity and Absence of Cycle	39
Group Level: Centrality Schema	41
Empirical Analysis of Dynamics Leadership Networks .....	42
Model Specification	42
Results	45
Testing Relational Leadership Schemas.....	47
Method	48
Results	49
Discussion	50
Conclusion .....	51
CHAPTER 5 - EMERGENT LEADERS: PERCEIVE THEMSELVES AS LEADERS?.....	53
Introduction.....	53
Theoretical Background.....	55
The Impact of Self-View as a Leader on Leadership Nominations from Peers	55
The Impact of Leadership Nominations from Peers on Self-View as a Leader	57
Self-Concept and Leadership Emergence: A Reciprocal Process	59
Modelling co-evolution of Leadership Networks and Self-View.....	60
Results.....	63
DISCUSSION.....	65

CHAPTER 6 - EMERGENT LEADERS: EMOTIONALLY INTELLIGENT?.....	67
Introduction.....	67
Theoretical Background.....	70
Research Design and Model.....	74
Results.....	78
Discussion.....	80
 CHAPTER 7 – DISCUSSION & CONCLUSION .....	83
Limitations .....	86
Future Research.....	87
 REFERENCES.....	89
 APPENDIX .....	113

## LIST OF FIGURES

Figure 1 - Tie in a Leadership Network .....	4
Figure 2 - Illustration: Static Leadership Network.....	5
Figure 3 – Illustration: Dynamic Leadership Networks.....	19
Figure 4 – Illustration - Relationship Leaders .....	75
Figure 5 – Illustration - Task-Leaders.....	75

## LIST OF TABLES

Table 1 – Actor Oriented Models, Individual Covariate Effects.....	20
Table 2 - Actor Oriented Models, Network/Structural Effects .....	22
Table 3 – p* models, Structural Effects .....	25
Table 4 – Summary Structural Effects.....	43
Table 5 - Longitudinal Analysis of Leadership Networks .....	46
Table 6 - Testing Network Schemas.....	49
Table 7 - Actor Oriented Models, Emergence Travel Leader.....	63
Table 8 - Emergence Travel Leader, Time Heterogeneity.....	64
Table 9 – Descriptive Network Statistics .....	75
Table 10 - Descriptive Statistics and Correlation Matrix .....	77
Table 11 - p* models for the emergence of relationship-oriented leaders .....	78
Table 12 - p* models for the emergence of task-oriented leaders.....	79

## CHAPTER 1 - INTRODUCTION

Emergent leaders are individuals whose power and authority over individuals in a group are derived from his, or her, acceptance by the group rather than from an office, position, status, or rank. In other words, emergent leaders have earned, over time and past experiences with others, their leadership role based on the group's acceptance and recognition: group members are emergent leaders to the extent that they are perceived as such by the rest of the group. In organizational settings, emergent leaders, also referred to as informal leaders, play a significant role. By complementing formal leaders' authority, emergent leaders influence group processes (Taggar, Hackett, & Saha, 1999), efficacy, emotions (Pescosolido, 2002) and, ultimately, outcomes (Kickul & Neuman, 2000; Mehra, Dixon, Brass, & Robertson, 2006; Oh, Chung, & Labianca, 2003)

Although the study of leadership emergence is not recent (Mann, 1959), the emergent leadership construct has not received similar levels of attention or analysis within the literature when compared to other models of leadership (Kickul & Neuman, 2000). However, a recent transformation of management paradigm reactivated scholars' interest in the study of leadership emergence. Facing increasing interdependence, complexity, and uncertainty in their environments (Manz & Sims, 1987), organizations reacted by flattening their organizational hierarchies. Following this growing trend for greater autonomy and decentralization, self-managing work teams increasingly occupy a pivotal role in organizations (Mahar & Mahar, 2004; Pescosolido, 2002). Because self-managing teams are not assigned a formal leader, the increasing implementation of autonomous work teams generates a social and organizational context in which emergent leaders are likely to play a primary role. This new organizational demand makes the study of the dynamics of emergent

leadership necessary and substantive. While researchers expressed the usefulness of viewing leadership as a dynamic social process and examining how certain individuals become emergent leaders in an interacting team (Kilckul & Neuman, 2000; Judge, Bono, Ilies, & Gerhardt, 2002), it is interesting to notice that studies on emergent leadership rarely operationalized the previous definition. Indeed, emergent leadership has rarely been assessed beyond a dyadic relationship between a formal leader and follower (Kickul & Neuman, 2000) and (surprisingly) investigated using a longitudinal approach.

As leadership emergence remains an intriguing social process, the purpose of this dissertation is two-fold. First, I make an important methodological contribution by adopting a *longitudinal analysis of leadership networks*. By envisioning leadership as a network, where nodes and ties represent actors and leadership nominations respectively, a more realistic, multilevel representation of leadership is portrayed and analyzed. This approach treats emergent leadership as more than a simple bivariate relationship between a leader and a follower, as it was the case in prior studies. It actually captures different levels of analysis: the individual, the dyad, and the group (Kickul & Neuman, 2000; Livi, Kenny, Albright, & Pierro, 2008). Second, although there is much theorizing about how leadership emerges and about the relevant individual traits involved in such process, we still know little about this particular dynamic process. In three manuscripts, I will apply the approach mentioned above to raise our understanding of leadership emergence. The purpose of my investigations is three-fold: to develop new research questions (how other group members' leadership perception may affect emergent leadership?), to find empirical evidence assumptions always assumed yet never tested (does self-view as a leader facilitate leadership emergence?), and to address current debates in the literature (are emergent leaders emotionally intelligent?).

## METHODOLOGICAL CONTRIBUTIONS

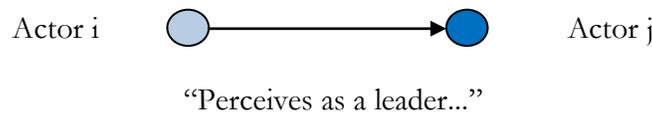
The aim of my doctoral dissertation is to extend emergent leadership research by performing *longitudinal analysis of networks of leadership perceptions*. A network of leadership perceptions (hereafter also referred to as “leadership network”) is composed of nodes and ties which represent social actors and leadership perceptions respectively. While scholars recognized the benefits of representing leadership as a network (Kickul & Neuman, 2000; Livi, Kenny, Albright, & Pierro, 2008), no research attempted to explore how leadership networks evolve over time. By capturing and modeling dynamic leadership networks, my investigations move from a traditional “single-leader/dyadic/cross-sectional” to a “multi-leader/group/longitudinal” study of leadership emergence. This dissertation makes a key methodological contribution to the study of leadership emergence by not only revealing an unexplored synergy between advanced social network analysis and leadership theories but also overcoming several methodological limitations apparent in prior emergent leadership studies.

### *From a “single-leader/dyadic” to a “multi-leaders/group” perspective*

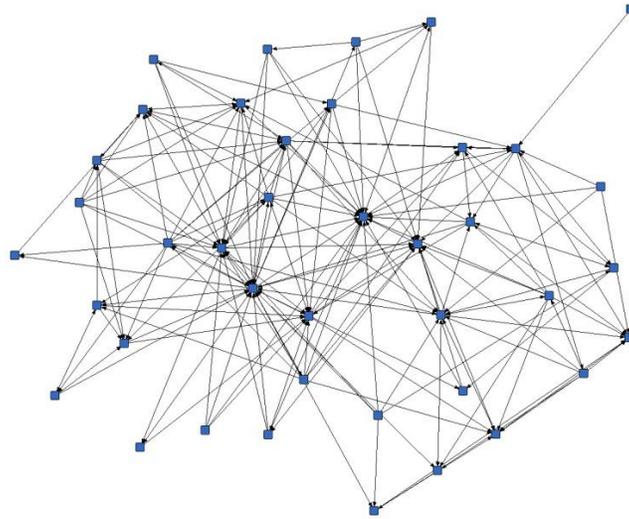
Prior studies tend to force the emergence of a single leader, regardless of the respective group size. Such design ignores the possibility that there can be multiple emergent leaders within a group (Mehra et al., 2006) and therefore does not properly reflect the dynamic process of leadership emergence. Moreover, emergent leadership rarely has been assessed beyond a dyadic relationship between a leader and a follower (Kickul & Neuman, 2000). In other words, while defined as a dynamic *group* process, studies failed to represent leadership emergence as a complex process involving all group members. This situation requires the adoption of a multilevel or complex

research approach to account for the complexities of leadership in intact contexts (Neubert & Taggar, 2004).

The study of distributed leadership overcomes these criticisms. The idea that leadership can be shared, or distributed, across a number of individuals, rather than being focused in a single leader, has recently received increasing attention (Gronn, 2002; Pearce, Conger, & Locke, 2007; Mehra, Smith, Dixon, & Robertson, 2006). Distributed leadership assumes that (1) leadership is not just a top-down process between the formal leader and team members – it is an inter-individual, multilevel phenomenon which involves all members in a particular group; and that (2) a group can contain multiple leaders (Mehra et al., 2006). Distributed leadership can be represented as a network where nodes and arrows represent individuals and leadership perceptions respectively. The direction of the tie distinguishes between leaders, who receive the tie, from followers, who send the tie (Figure 1). As all group members are included in the network, emergent leaders are identified by nodes receiving higher number of ties, i.e., higher number of leadership nominations by the rest of the group (Figure 2). Analyzing distributed leadership benefit from the application of social network analysis, a methodology which treats groups as complex, interactive, and multi-person social systems (Borgatti & Foster, 2003).



**Figure 1** - Tie in a Leadership Network



**Figure 2** - Illustration: Static Leadership Network

*From a cross-sectional to longitudinal research design*

Many emergent leadership studies have been conducted in laboratory settings in which the dyad typically is required to interact for only a few minutes (Moss & Kent, 1996). In reality, leadership emergence is a social process dependent on time and social interactions among group members. Surprisingly, past emergent leadership research primarily uses a cross-sectional approach, and this design is perplexing given that leadership development is assumed to be an ongoing process (Bass, 1990; Bluedorn & Jaussi, 2008). As leadership emergence is a dynamic process, an analysis of this phenomenon would benefit from the use of a longitudinal perspective (Judge et al., 2002).

To conduct my investigations, I perform a *longitudinal analysis of networks of leadership perceptions*. While social network analysis has been successfully applied to study distributed leadership using a cross-sectional approach, longitudinal analysis of distributed leadership has not been explored. As emphasized by Mehra et al. (2006: 242), “research that investigates how leadership networks evolve in teams over time will, we believe, pay handsome dividends. Not only would such research

contribute to our ability to understand and potentially harness distributed leadership in teams, it would also help address fundamental questions that are being raised about the processes of change and transition in networks”. In summary, by adopting a dynamic assessment of leadership networks, this dissertation offers a new methodological and analytical strategy to structure and analyze how leadership emerges over time.

## RESEARCH CONTRIBUTIONS

The format of my thesis is ‘cumulative’, that is, it integrates three individual scholarly papers into one. Each paper makes a particular research contribution. The first article examines leadership emergence as the result of group processes. It raises a new research question: is leadership emergence dependent on the leader’s characteristics only? In this paper, my co-authors and I argue that emergent leaders are constrained by the emerging structure of leadership perceptions within a group which are ruled by relational/“leadership” schemas. In the second article, my co-authors and I assess the adage “You will be a leader if you see yourself as a leader.” We investigate how leadership emergence is a proactive process requiring a self-view as a potential leader (Lord & Hall, 2005) and how grounded views of the self are elaborated by the emerging order created in a group. Its contribution is to find statistical evidence for a commonly hypothesized, but not tested, process. Finally, the third article addresses a vivid debate: do emergent leaders need emotional intelligence (Antonakis, Ashkanasy, & Dasborough, 2009; Ashkanasy & Daus, 2005; Côté, Lopes, Salovey, & Miners, 2009)? The issues addressed and the contributions achieved in the three manuscripts are summarized here in more detail.

*How emergent leaders are the result of group processes? A structural approach to leadership emergence*

Since emergent leaders play a significant role in influencing group processes, norms, and performance, it is important to understand *how* leadership emerges in an undifferentiated group. While previous approaches explored the individual characteristics, we believe that leadership emergence is not dependent on the leader's characteristics only: emergent leaders are constrained by the emerging structure of leadership nominations within a group which are ruled by relational schemas.

Schemas are shared sets of organized, affectively tagged information that represent, or imply, relations between abstract and specific actors (Ridgeway, 2006). They enable people to interpret complex social information, fill in missing data by supplying default options, and categorize events, things, people, interactions, and other stimuli into familiar categories (Kilduff, Crossland, Tsai, & Krackhardt, 2008). Different schemas may help structure different types of social networks (Ibarra, Kilduff, & Tsai, 2005; Janicik & Larrick, 2005; Krackhardt & Kilduff, 1999). As leadership is an extensive and complex process which involves people who coordinate with each other so that their action, affect, identity, and evaluation are complementary and consistent, people may rely on relational schemas to structure leadership emergence. More precisely, we believe that individuals rely on three specific network schemas to consistently create a hierarchy when nominating someone as a leader: the non-reciprocity schema, the linear-ordered schema, and popularity-schema.

By understanding the structural effects ruling the evolution of leadership networks, this research adds a new explanation of leadership emergence. It argues that relational schemas are also active in people's mind when it comes to designating someone as a leader. People, when nominating a leader, do not search for great men only: they also are constrained by the choice of others, and by patterns in leadership nominations.

*Do emergent leaders perceive themselves as leaders? Investigating the reciprocal effects of self-view as a leader and leadership emergence.*

Prior work has identified several individual-level characteristics associated with emergent leadership, such as gender, self-esteem, self-monitoring, cognitive skills, and emotional abilities (Mehra, Kilduff, & Brass, 2001; Kellett et al., 2002, 2006). Another individual characteristic that warrants examination is an individual's self-view as a leader. An increasing number of management books and Human Resources seminars support the idea that one needs to see him- or herself as a leader in order to emerge as one. Leadership scholars have also recently recognized that adopting a self and identity perspective may be fruitfully applied to understand leadership emergence (Lord & Hall, 2005; van Knippenberg, van Knippenberg, De Cremer, & Hogg, 2005). However, while both practitioners and scholars agree that a leader's self-view is important, no quantitative studies to date have examined how an individual's self-view as a leader impacts leadership emergence. In this paper, we test the idea that "You can be a leader if you see yourself as a leader". In addition, we investigate how, in return, the process of leadership emergence influences one's self-view as a leader.

We argue that people who perceive themselves as a leader (i.e., engage in leadership "role taking") are more likely to receive leadership nominations (i.e., obtain "peer perception" as a leader) over time. As these individuals become more "popular" in terms of leadership nominations (i.e., start emerging as a leader for the group), their perception of themselves as a leader will increase.

*Are emergent leaders emotionally intelligent? Investigating the role of emotional abilities in leadership emergence.*

The third article addresses an active debate: do emergent leaders need emotional intelligence (Antonakis, Ashkanasy, & Dasborough, 2009; Ashkanasy & Daus, 2005; Côté, Lopes, Salovey, &

Miners, 2009)? While researchers have questioned the role played by emotional intelligence in leadership issues (Antonakis, 2004), others see emotional intelligence as “an exciting and developing area of research in organizational behavior, and a key component of the current burgeoning interest in emotions in organizational settings” (Ashkanasy & Daus, 2005: 441-442). Compared to the role of traits and cognitive abilities in leadership emergence, the role played by emotional abilities remains under-investigated (Kellert, Humphrey, & Sleeth, 2002, 2006). This paucity of research is surprising because early work on emergent leaders suggested that informal leaders are skilled at taking in and understanding emotional information (Wolff, Pescosolido, & Druskat, 2002). According to Mayer, Salovey, and Caruso’s ability model, emotional intelligence encompasses four emotional abilities: (i) perceiving emotions in oneself and in others, (ii) using emotions to facilitate decision making, (iii) understanding the causes, consequences, and evolution of emotions, and (iv) managing emotion. Since different emotional abilities may have potentially different impacts on leadership emergence (George, 2000), the aims of this paper are to examine how, and to which extent, the different emotional abilities influence leadership emergence in a natural, leaderless, group. This research suggests that emotional abilities, because they imply different skills and behaviors, seem to have a different influence on the emergence of relationship-leaders.

## SUMMARY

In summary, through three working papers, the current thesis investigates the group processes and individual characteristics promoting leadership emergence. It reveals that (i) emergent leaders are constrained by the emerging structure of leadership nominations within a group, (ii) reinforcing one self-view as a leader has positive impact on emergent leadership, and (iii) emotional intelligence matters for leadership emergence.

## CHAPTER 2 - LITERATURE REVIEW

The majority of the leadership research attempts to explain what leadership *is*, and how it could be more effective. The topic now turns to how it *emerges* in an undifferentiated group. Emergent leadership has been defined as a dynamic social process during which a specific individual adopts the role of leader (Moss & Kent, 1996) or as group members who exert significant influence over other members of the group, although no formal authority is vested to the emerging leader (Schneider & Goktepe, 1983). Instead of reviewing well-known personality traits, behaviors, or environmental characteristics impacting leadership emergence (for extensive reviews see Avolio, Walumbwa, & Weber, 2009; Hogan & Kaiser, 2005; Judge, Bono, Llie, & Gerhardt, 2002; Judge, Colin, & Ilies, 2004; Mahar & Mahar, 2004), I chose to review how past leadership research can be integrated with social network techniques. My overall objectives of this literature review are to understand past synergies between social network analysis and leadership issues, and to discuss how it can be (or cannot be) successfully applied to study emergent leadership.

### LEADER-MEMBER EXCHANGE

The Leader-Member Exchange theory, also referred to as LMX or Vertical Dyad Linkage Theory, is a relationship-based approach to leadership (Dansereau, Graen, & Haga, 1975). The focal point of the leadership process resides on the dyadic relationship between an appointed leader and a follower (Graen & Uhl-Bien, 1995; Yukl, 1998) and how it positively impacts individual, groups, and, ultimately, organizational outcomes (Gerstner & Day, 1997; Sparrowe, Soetjijpto, & Kraimer, 2006). The theory posits that “leadership occurs when leaders and followers are able to develop

effective relationships that result in mutual and incremental influence” (Avolio, Walumbwa, & Weber, 2009: 433; Uhl-Bien, 2006).

LMX theory has been largely criticized of locating its research “at the dyadic level, with very little theorizing or empirical work examining LMX work at the group level” (Hogg et al. 2004: 22; Avolio et al., 2009). Recent developments of LMX theory address these concerns. For example, Offstein, Madhavan, and Gnyawali (2006) proposed extending LMX research to triadic level of analysis. By using exponential graph models (a methodology used in the third article of this dissertation), they identified, analyzed, and explained why particular triads form and how they function (Uhl-Bien, 2006). Moreover, Graen (2006) integrated social network theory and LMX to view organizations as systems of interdependent dyadic relationships in which both formal and informal influences on individual, team, and network flows of behavior need to be taken into account (an approach called “the new LMX–MMX theory of sharing network leadership”).

### *LMX & Leadership Emergence*

Although the LMX theory recognizes that relationships between leaders and follower evolve over time and, in recent developments, uses advanced social network techniques, this particular approach is not suitable to the study for leadership emergence. Indeed, the LMX theory simply describes the formation of the relationship (in terms of quality) between each follower and a formal leader (Yukl, 1998). LMX theory does not aim at understanding the dynamic process during which certain persons are perceived as leaders by other group members. Moreover, the LMX theory cannot be applied outside formal, hierarchical organizations or group works. Finally, since no research has been published on emergent leadership phenomenon and the LMX theory, it appears that the model is not applicable to the study of emergent leadership (Mahar & Mahar, 2004).

## STRUCTURAL APPROACHES

Structural approaches to leadership investigate the link between leadership and the *overall pattern or structure of interaction* in a group (Fernandez, 1991). Structural approaches focus on structural forms, i.e., localized emergent characteristics in terms of the pattern of closed or open ties, surrounding a particular actor (Burt, 1992). The structural approach to leadership suggests that a formal leader's influence, reputation, power, and eventual effectiveness are dependent on the leader's pattern of informal ties (Astley & Sachdeva, 1984; Balkundi, 2004; Balkundi & Kilduff, 2005; Mehra et al., 2006).

Three types of research were conducted to test this premise. First, scholars argued that formal leaders' popularity in informal networks was related to team performance (popularity-performance hypothesis). A leader's position in an informal network was measured in terms of his or her "popularity" (in network terms, "indegree centrality"), i.e., by the number of affective choices (in terms friendship, liking, desirable work partner, or respect) he or she receives. Many studies supported the popularity-performance hypothesis (see Balkundi, 2004 for an extensive review). Second, extensive research explored the impact of brokerage positions, or structural holes (in network terms referred to as "betweenness centrality"), on leadership perceptions and emergence (Balkundi & Kilduff, 2006). Such studies demonstrated that individuals with the greatest control over communication networks, i.e., brokers in a communication network, tend to be viewed as leaders by other group members (Freeman, Roeder, & Mulholland 1980; Mullen, Johnson, & Salas, 1991). Finally, the impact of another structural position was recently investigated: what Balkundi and Kilduff (2005) refer to as "borrowed" centrality (in network terms referred to as "eigenvector centrality"). A borrowed centrality allows a leader "to avoid the perils of popularity (too many ties to maintain) and the potential hazards of the go-between position (conflicting demands from

disconnected actors). A few connections can provide access to valuable resources if they are to prominent actors. These enhanced resources may show up in terms of improved team effectiveness. For example, in one study, team leader friendship with other prominent leaders tended to positively affect the level of sales and customer loyalty (Mehra, Dixon, Robertson, & Brass, 2004)” (Balkundi & Kilduff, 2005: 433).

### *Structural Approaches & Leadership Emergence*

The structural approach to leadership mainly explores if a formal leader’s influence is dependent on the leader’s overall pattern of informal ties. This approach informs us of a crucial element of leadership: informal relationships, as well as one’s structural position within informal networks, matter. So, if informal networks have implications for the efficiency and performance of formal leader, one can ask if informal networks matter when it comes to leadership emergence. Some studies already addressed this question. In a set of laboratory experiments, where communication networks were designed and manipulated by the researchers, Freeman, Roeder, and Mulholland (1980) revealed that individuals with the greatest control over communication networks tended to be perceived as leaders. Moreover, in their meta-analysis of eight studies, Mullen et al. (1991) found that betweenness and degree centrality in communication networks to be significant and independent predictors of leadership. However, in self-managing groups evolving outside of laboratory settings, one may question if betweenness and centrality positions in informal networks still impact emergent leadership. Do we nominate friends as leaders? Do we nominate people we frequently talk to as suggested by Lord (1977)? Although not my main focus of investigation, my research will take into account, or at least control for, how affective choices are related to leadership emergence.

## DISTRIBUTED LEADERSHIP

The idea that leadership can be shared, or distributed, across a number of individuals, rather than being focused in a single individual who acts in the role of a leader, has recently received increasing attention (Gronn, 2002; Pearce, Conger, & Locke, 2007; Mehra, Smith, Dixon, & Robertson, 2006). The model of distributed leadership assumes that (1) leadership is not just a top-down process between the formal leader and team members – it is an inter-individual and multilevel phenomenon in which all members have a role to play (whereas of a leader or follower); and that (2) a group can contain multiple leaders (Mehra et al., 2006). There are different degrees of distributed leadership in teams: at one end of the spectrum, leadership is centralized in one individual only (single leader), at the other end, the model supposes that all team members have leadership and must be responsible for team's objective, support one another and take their own responsibility to make their team success (Liu & Wei, 2009).

To represent how leadership is distributed among group members, a sociometric/network approach must be adopted. People's perceptions, or nominations, of leaders can be “mapped” into a network where nodes and arrows represent individuals and leadership nominations respectively. The direction of the tie distinguishes between leaders, who receive the tie, from followers, who send the tie. As all group members are included in the network, emergent leaders are identified by nodes receiving higher number of ties, i.e., higher number of leadership nominations by the rest of the group.

Because distributed leadership moves away from individualist, essentialist, and atomistic explanations toward more relational and contextual understanding of leadership, a methodology which treats groups as complex, interactive, and multi-person social systems need to be used: social network analysis (Borgatti & Foster, 2003). As argued by Mehra et al. (2006: 233), “[s]ocial network

analysis is especially well suited to the study of distributed leadership because it is an inherently relational approach that allows for the possibility that there can be multiple leaders within a group, and because it provides methods for modeling both vertical (...) and lateral (...) leadership relations within a team. Another strength of the social network approach is that (...), it better preserves information about the actual pattern of leadership distribution within teams”.

### *Distributed Leadership & Leadership Emergence*

Contrary to a leader-centered approach to leadership, the model of distributed leadership envisions leadership as a team-level construct: leadership in teams is a distributed, shared phenomenon. Distributed leadership assumes that leadership is an inter-individual, multilevel phenomenon which involves all members in a particular group and results in the emergence of multiple leaders. This model of leadership moves away from traditional “top–down great-man leadership” approaches (Ensley, Hmieleski, & Pearce, 2006). Because it treats groups as complex, interactive, and multi-person social systems, distributed leadership should be represented, and analyzed, as network of leadership perceptions, i.e., leadership networks.

So far, scholars have analyzed static characteristics of distributed leadership (as density, or overall structure) on group performance (Mehra et al., 2006; Carson, Tesluk, & Marrone, 2007). The model of distributed leadership was not applied to the study of leadership emergence despite that research is needed that investigates how leadership networks evolve in teams over time. Such research would contribute to our ability to understand leadership emergence as it can address fundamental questions about the processes of change in networks (Mehra et al., 2006; Monge & Contractor, 2003).

## SUMMARY

My overall objectives of this literature review was to understand past synergies between social network analysis and leadership issues, and to discuss how it can be (or cannot be) successfully applied to study emergent leadership. It results that the model of distributed leadership, by envisioning leadership as a network of perceptions, provides an adequate and promising approach to study emergent leadership, especially if modeled longitudinally.

Due to recent advances in social network analysis, it is now possible to perform a longitudinal analysis of distributed leadership. By collecting longitudinal data on distributed leadership within a natural group and modeling its evolution over time, I aim to answer researchers' call for studies that investigates how leadership networks evolve in teams over time. As emphasized by Mehra et al. (2006: 242), “[n]ot only would such research contribute to our ability to understand and potentially harness distributed leadership in teams, it would also help address fundamental questions that are being raised about the processes of change and transition in networks”.

## CHAPTER 3 - METHODOLOGY & DATA

Because the remaining chapters of this dissertation use the same method, sample, and measures, I decided to dedicate an entire chapter to *Methodology and Data*. After explaining why researchers can benefit from building models of social networks, I provide an overview of the two research methods: models for longitudinal analysis of social networks and exponential random graph models. The aim of each model as well as its basic assumptions, equations, and effects/variables will be presented. Finally, I describe the sample, data collection procedures, and measurements used to test my research questions.

### WHY MODEL SOCIAL NETWORKS?

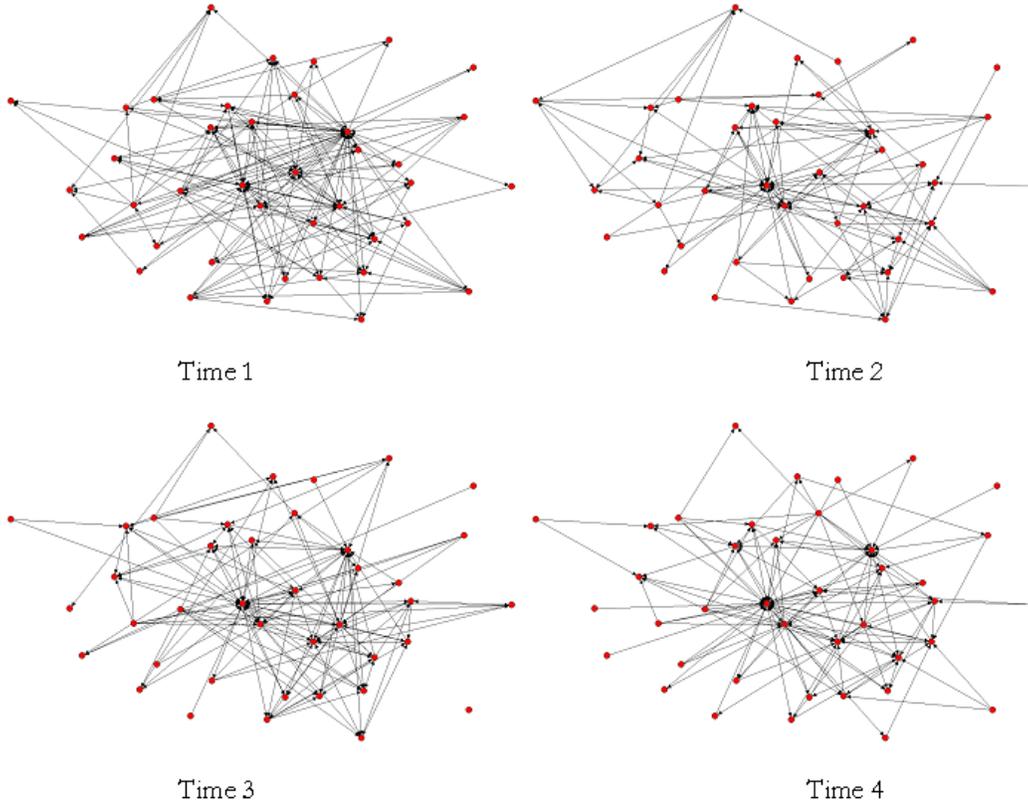
There are many well-known techniques that measure properties of a network (e.g., density, centralization and connectedness) and of nodes in the network (e.g., centrality, brokerage position). These descriptive techniques have been effectively used to investigate the constraining and enabling dimensions of structure in relationships within groups (Emirbayer & Goodwin, 1994). Due to recent developments, it is now possible to go beyond these descriptive techniques and search for a well-fitting *model* of observed social networks (Robbins, Pattison, Kalish, & Lusher, 2007). *Modeling* social networks offers several advantages compared to traditional, descriptive, network statics. First, network models are seen as the most productive way of examining complex social structure because “social behavior is complex, and stochastic models allow us to capture both the regularities in the processes giving rise to network ties while at the same time recognizing that there is variability that we are unlikely to be able to model in detail” (Robins et al., 2004: 174). Secondly, network models rely on real data to explore the potential social processes that might be responsible for the creation

of particular network structures. Moreover, network models allow assessing the relative and different roles that different local processes exert on network structures. It is only through careful quantitative modeling that the differences in predictions can be evaluated. Lastly, network models allow connecting global network patterns with local-level relations (Lusher, 2006) and analyzing whether such localized processes and structures are sufficient to explain global network properties. Models permit some understanding of a local-global connection, by bridging the “micro-macro gap” (Emirbayer & Goodwin, 1994).

### MODEL FOR LONGITUDINAL NETWORK ANALYSIS

Since leadership emergence occurs over time, a longitudinal perspective and analysis of leadership networks offers the opportunity to understand the process as it occurs in the real world. In two papers, I will adopt an innovative approach, made possible by recent advances in social network techniques and models, to overcome the previous limitation: a longitudinal assessment of leadership networks (Figure 3). This perspective provides a methodological and analytic strategy that allows researchers (i) to capture the complexity of the dynamic evolution of leader emergence, and (ii) to structure and analyze how social relations among actors evolve over time. To conduct a longitudinal analysis on leadership networks, I specified a *stochastic actor-oriented model*, which examines how networks driven by social actors evolve over time (Snijders, 2005, 2006, 2009; Snijders, Steglich, & van de Bunt, 2009). Actor-oriented models focus on the individual actions, or decisions, responsible for the evolution of social networks. In a social network context, actors can make three types of decisions: they can create ties with other actors, they can delete ties, or they can make no changes to their network configuration. These decisions are assumed to stochastically optimize the actor’s

objective function, which represents an actor's evaluation of, or preference for, a certain network configuration compared to the current state of the network (Snijders, 2006).

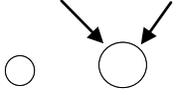
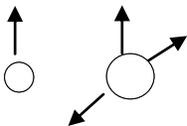
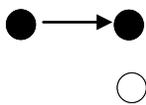


**Figure 3** – Illustration: Dynamic Leadership Networks

Following Snijders' notations, the objective function of actor  $i$ ,  $f_i(x^0, x, v, w)$ , depends on the current state of the network  $x^0$ , the potential new state of the network  $x$ , individual covariates  $v$ , and dyadic covariates  $w$ . When an actor is given the opportunity to execute a change in his or her network configuration  $C(x^0)$ , the probability to choose the new state  $x$  is given by:

$$P_i\{\text{Change from } x \text{ to } x^0\} = \frac{\exp(f_i(x^0, x, v, w))}{\text{sum}(f_i(x^0, x', v, w)) \text{ for } x' \in C(x^0)}$$

In my studies, the dependent variable is therefore the probability that actor *i* perceives actor *j* as a leader (i.e., that actor *i* chooses to select actor *j* as a leader). Two types of effects related to individual covariates can be included in the objective function. *Covariate-receiver effects* (noted “covariate-alter”) capture the tendency for actors who score high on the covariate to receive an increasing number of ties over time. This type of effect can be used to assess hypotheses based on trait theory, as they capture the “direct effect” of individual characteristics on leadership emergence. For example, if emotional intelligence has a positive receiver effect, it implies that people with higher emotional intelligence are more likely to receive leadership nominations (i.e., are more likely to emerge as leaders over time). *Covariate-similarity effects* (noted “covariate-similarity”) capture the tendency for actors to send ties to people who are similar to themselves. This covariate can be used to assess hypotheses based on homophily. Finally, *covariate-sender effects* (noted “covariate-ego) capture the tendency for actors who score high on the covariate to send a greater number of ties (illustrative example, girls are more likely to nominate a greater number of leaders than men). A visual representation of these effects is provided in Table 1.

<i>Covariate Effect</i>	<i>Interpretation</i>	<i>Pattern</i>
<b>Covariate Receiver</b>	Actors who score higher on the covariate are more likely to receive tie	
<b>Covariate Sender</b>	Actors who score higher on the covariate are more likely send ties	
<b>Covariate Similarity</b>	Tendency for actors to send ties to people with similar level of the covariate	

**Table 1** – Actor Oriented Models, Individual Covariate Effects

Furthermore, network ties are characterized by well known tendencies to self-organize into a variety of local structures. Actor-oriented models can capture the presence, or absence, of such tendencies. There are five principal structural effects (refer to Steglich, Snijders, & Pearson, 2010 for a full description of all possible effects). *Out-degree* represents the basic tendency to have ties at all. *Reciprocity* captures a basic feature of most social networks (like friendship): the tendency of ties to be mutual. Usually, actor oriented models record quite high values for its parameter, e.g., between 1 and 2. *Transitive triplets* effect is the classical representation of network closure (sometimes called clustering) (Holland & Leinhardt, 1971). In friendship networks, transitivity represents the saying “Friends of my friends are my friends”. In a leadership network, transitivity implies that if actor *i* perceives actor *j* as a leader, and actor *j* perceives actor *h* as a leader, then actor *i* will also perceive actor *h* as a leader. *Three-cycle* effect denotes the tendency for a relationship to be cyclical (i.e., if there is a tie from *i* to *j*, and also from *j* to *h*, there is also a tie from *h* to *i*). Generally, there is a tendency to have relatively few three-cycles in social networks. Like emphasized by Snijders (2010”: 48), “[t]he transitive triplets and the three-cycle effects both represent closed structures, but whereas the former is in line with a hierarchical ordering, the latter goes against such an ordering. If the network has a strong hierarchical tendency, one expects a positive parameter for transitivity and a negative for three-cycles”. Finally, *Popularity* signifies that popular actors who receive a large number of ties become more and more popular, attractive, as time passes. “A positive in-degree popularity effect implies that high in-degrees reinforce themselves, which will lead to a relatively high dispersion of the in-degrees” (Snijders, 2009). In my analysis, popularity is an important parameter as it captures the emergence of leaders over time: popular actors are individuals who receive more and more leadership nominations over time. This parameter indicates if leaders actually emerged in my sample. A summary and visualization of all the structural effects are provided in Table 2.

<i>Network Effect</i>	<i>Interpretation</i>	<i>Pattern at t</i>	<i>Pattern at t+1</i>
Out-degree	Basic tendency to perceive leaders at all		
Reciprocity	Tendency for leadership perceptions to be reciprocated		
Transitive Triplets	Classical representation of network closure		
Popularity	Actors who receive many ties become more and more attractive		
Three-Cycles	Tendency for relationship to be cyclical		

**Table 2 - Actor Oriented Models, Network/Structural Effects**

Actor-oriented models are run using the software SIENA, which stands for “Simulation Investigation for Empirical Network Analysis”. All parameters reported in the articles were estimated using conditional method of moments. Reported results all were taken from runs in which all ‘*t*-ratios for convergence’ were less than 0.1 in absolute value, indicating good convergence of the algorithm. When models report positive and significant parameters, it suggests that network evolution is driven by the tendency captured by the parameter (for example the tendency for ties to become reciprocal over time). On the other hand, negative and significant parameters imply that network evolution is not driven by the tendency captured by the parameter.

## EXPONENTIAL RANDOM GRAPHS

Another type of models can be developed to study leadership networks: Exponential Random Graphs Models (ERGM), also known as  $p^*$  (p-star) models (Snijders, Pattison, Robins, & Handcock, 2006). ERGM do not model the evolution of networks over time. ERGM are used to model one observed network (static network). The observed network is regarded as one realization from a set of possible networks with characteristics (such as same number of actors, same number of ties). That is, the observed network is regarded as the outcome of some (unknown) stochastic process. The goal in formulating a model is to propose a plausible and theoretically principled hypothesis for this process (Robins, Pattison, Kalish, & Lusher, 2007).

ERGM consider each individual network tie as a random variable. For each individuals  $i$  and  $j$ , a random variable  $Y_{ij}$  was defined so that  $Y_{ij} = 1$  if actor  $i$  perceives actor  $j$  as a leader, and  $Y_{ij} = 0$  otherwise. Because leadership is a human process which implies a certain hierarchy,  $Y_{ij}$  may be different from  $Y_{ji}$ .  $y_{ij}$  is defined as the observed value of the variable  $Y_{ij}$  and  $\mathbf{Y}$  as the observed network. Following Robins et al. (2007) notations, ERGM takes the following general form:

$$\Pr(\mathbf{Y}=\mathbf{y}) = \left(\frac{1}{k}\right) \exp \left\{ \sum_{\mathcal{A}} \eta_{\mathcal{A}} g_{\mathcal{A}}(\mathbf{y}) \right\}$$

where (1)  $\mathcal{A}$  refers to possible network configurations; (2) the summation is over all configurations  $\mathcal{A}$ ; (3)  $\eta_{\mathcal{A}}$  is the parameter corresponding to the configuration  $\mathcal{A}$ ; (4)  $g_{\mathcal{A}}(\mathbf{y}) = \prod_{i,j} y_{ij}^{\mathcal{A}_{ij}}$  is the *network statistic* corresponding to configuration  $\mathcal{A}$  so that  $g_{\mathcal{A}}(\mathbf{y}) = 1$  if the configuration is observed in the network  $\mathbf{y}$ , and is 0 otherwise; (5)  $k$  is a normalizing quantity which ensures that (1) is a proper probability distribution. All exponential random graph models are of the form of Equation (1) which describes a general probability distribution of graphs. The probability of

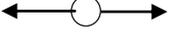
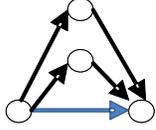
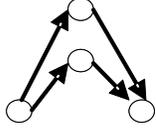
observing any particular graph  $\mathbf{y}$  in this distribution is given by the equation, and this probability is dependent both on the statistics  $g_A(\mathbf{y})$  in the network  $\mathbf{y}$  and on the various non-zero parameters  $\eta_A$  for all configurations  $A$  in the model. While  $A$  represent possibilities of network configurations,  $g_A(\mathbf{y})$  indicates whether configuration  $A$  is in fact observed in the network  $\mathbf{y}$ . Configurations might include dyadic (reciprocity), triadic (triads – transitivity, cycle) and higher orders levels of analysis (alternative k-star, k-triangles, k-paths) (Offstein et al., 2006).

To include the effects of individual covariates, noted as a vector named  $X$ , the probabilities defined in equation (1) need to be adjusted. To take account of fundamental differences among participants susceptible of influencing the probability of forming a tie, equation (1) need to be re-specified as:

$$\Pr(Y=y | X=x) = \left(\frac{1}{k}\right) \exp \{ \sum_A \eta_A g_A(\mathbf{y}) + \sum_R \lambda_R Z_R(\mathbf{y}, \mathbf{x}) \}$$

where  $\sum_A \eta_A g_A(\mathbf{y})$  is as defined in (1), and  $\sum_R \lambda_R Z_R(\mathbf{y}, \mathbf{x})$  is the model component that defines the effects of dyadic variables ( $\mathbf{y}$ ) and individual attributes ( $\mathbf{x}$ ) on the probability of observing a tie. Dyadic variables examine how leadership is affected by other social dynamisms (Uhl-Bien, 2006), like friendship or frequency of social interactions. In other words, ERGM can control if the occurrence of a particular network (leadership) is dependent on another social relationship (like friendship). Individual covariates explore if higher scores on the covariate affects the propensities to send ties (sender-effect) and to receive ties (receiver-effects). In my investigations, as it is the case of the longitudinal network models I developed, I focus on *receiver-effects only*. Receiver-effects capture the tendency for actors who score high on the covariate to receive more ties, i.e., more leadership nominations, than actors who score low on the covariate. Finally, as it is the case for longitudinal network models, exponential random graphs must control for well known tendencies for network

ties to self-organize into a variety of local structures. Examples of such structures include reciprocity, the tendency of social relations to be mutual, and transitivity, the tendency of social networks toward transitive closure. As Snijders et al. (2006) explain, it is advisable to control for a variety of local network structures when using empirical specifications of ERGM. Including structural effects allows capturing high-order dependency structures that may be present in networks while avoiding the problems of degeneracy described by Handcock (2003). I therefore incorporate six endogenous network effects to control for characteristics of the degree distribution and for the general tendencies toward transitivity: arc, reciprocity, 2-in-star, 2-out-stars, path-closure and multiple-two-paths. *Arc* denotes the basic propensity to create of social ties. *Path-closure* denotes the tendency of structural holes to be closed. *Multiple-2-paths* represent the number of distinct two-paths between a pair of nodes (Robins et al., 2007). Visualization of these effects is given in Table 3.

<i>Network Statistic</i>	<i>Pattern</i>	<i>Interpretation</i>
Arc		Tendency to perceive someone else as a leader
K-in-Star		Tendency to receive ties, i.e. to be perceived as a leader
K-out-Star		Tendency to send ties, i.e. to perceive others as leaders
Path Closure		Tendency of perceived leadership to give rise to transitive relation
Multiple Two Paths		Tendency of leadership to create multiple connectivity

**Table 3** –  $\rho^*$  models, Structural Effects

## SAMPLE & MEASURES

While significant amounts of research focused on the emergence of leaders in working teams, researchers have called for the study of leadership emergence in natural groups. As Mahar and Mahar (2004) point out “laboratory stringency regarding the size and composition of the groups may be a primary reason for research conclusions, (...). Researchers should investigate natural groups and composition variables should be controlled statistically rather than experimentally”. In this section, I describe the sample I used to capture the emergence of leaders in a natural, leaderless group. I also discuss what data was gathered, and how it collected and measured.

### *Social Context of the Study*

To conduct my investigations, I rely on data collected from two cohorts of American undergraduate involved in a study abroad program with a Swiss University in 2008 and 2009. The first cohort was composed of 37 women and 3 men, while the second cohort was composed of 35 women and 8 men. The program required students to live in Switzerland for a period of four months, attend several classes (marketing and management lectures as well as language classes), to work closely with local students on a consultant-like field project that addresses a significant social problem, and, finally, to travel to seven predefined cities in Europe. Participants from both cohorts had to satisfy the same requirements in terms of class, assignments, field projects, and travelling. Working successfully on class and field projects was a major requirement of the program: all projects were evaluated by instructors or by clients and these evaluations would be the basis for completing the program and receiving 18 university credits. Students had a strong incentive to accomplish each project’s goals and requirements. Participants were provided with accommodation and lived together in the same location, therefore facilitating the creation of a cohesive, natural, group. Neither

restrictions nor research manipulations were imposed on the group composition and no research interventions were set up to influence the group's natural dynamics (for example, no formal leader was designated as responsible for the rest of group). While students did not have to search for accommodation, they had to organize themselves concerning day-to-day activities as well as for travelling issues (dates, bookings, transports, visits, etc.). In this particular group, the majority of participants did not know each other before joining the program nor had living experiences outside the United States.

This particular sample, although constrained, offers several advantages (Yeung & Martin, 2003). First, studying leadership emergence in a natural and leaderless group overcomes several shortcomings of past emergent leadership research, namely that laboratory experiments tend to last a short period of time, tend to focus on masculine-specific tasks, and “force” the emergence of a single leader (Mahar & Mahar, 2004; Moss & Kent, 1996). Indeed, as no research manipulation or intervention were developed to influence leadership emergence and no restrictions were imposed concerning the number of leaders to emerge, the actual leadership emergence was captured. Second, leadership networks for each group were collected at four points in time (end of January, February, March, and April), therefore capturing how leadership evolved over time. Third, all participants agreed to take part in the study and were present at each round of data collection, resulting in no missing data. Fourth, participants from each cohort spent a large amount of time together which allowed the groups' social dynamics to impact members' self-perceptions (relevant for the second paper). It also allowed all members know each other and can easily determine who is a leader for the group and who is not. Finally, groups were composed of young adults, who are particularly concerned with being recognized and accepted as leaders (Lord & Hall, 2005).

*Data Collection – Dynamic Leadership Networks*

To collect leadership networks, I used paper questionnaires which were distributed in class. At each round of data collection, one research assistant was present to reassure participants about the confidentiality and anonymity of the study, administer the questionnaire, answer participants' interrogations, and make sure that all questionnaires were completed and returned. To make participants feel comfortable when answering the questionnaire, the research assistant would allow students to leave the classroom to get some privacy when completing the questionnaire.

Following this procedure, three types of leadership networks were collected for each cohort at four points in time (end of January, February, March, and April): travel-leaders ("In the past month, who you perceive as a leader for the group when it comes to travel?"), class leaders ("In the past month, who you perceived as a leader for the group when it comes to class?") and people leaders ("In the past month, who you saw as a person to whom people in the group go to when they are upset or need personal support?"). Note that no particular definition of the term "leader" was provided. This approach is similar to that used by other authors when the intent is to capture respondents' personal and implicit theories of leadership (Carson et al., 2007). As emphasized by Mehra et al. (2006), this method of capturing leadership networks is consistent not only with the classic sociometric work on leadership in teams but also with the theoretical conception of leadership as a phenomenological construct (i.e., a leader is someone who is perceived as such by others; Calder, 1977; Meindl, 1993). For each leadership network, respondents were free to nominate as many people as they deemed appropriate. To record their answers, respondents had to place a check by the names of each person they saw as a leader on a listing containing all participants' names. Answers were coded into two 40-by-40 binary adjacency matrices, where a 1 in cell (i,j) indicates that actor i says to perceive actor j as a leader, 0 otherwise. Four matrices (one for

each point in time) were constructed for each type of leaders. The relational information expressed in each matrix was then converted into a social network.

*Data Collection– Other Social Networks*

Leadership and friendship networks may be related: people may nominate friends as leaders. To control for this factor, at the beginning of the study abroad program, each group was administered a questionnaire on the plane to Switzerland. Students were asked who they considered as personal friends. Initial friendships were coded as a complete network represented by a 40-by-40 binary adjacency matrix, where a 1 in cell(*i,j*) indicates that actor *i* is friend with actor *j*, and 0 otherwise.

Leadership perception may also be linked to frequency of social interactions (Lord, 1977). To assess social interactions among participants, respondents were asked how many hours they spent with each person outside university time. The data was coded to encounter only strong and frequent social interactions among participants (more than seven hours per week outside class and living space). A 40-by-40 binary adjacency matrix, where a 1 in cell(*i,j*) indicates that actor *i* says to spent significant amount of time with actor *j* and 0 otherwise, was coded to represent social interactions.

*Data Collection – Individual Characteristics*

Group members are emergent leaders to the extent that they are perceived as such by the rest of the group. Hence, the study of leadership emergence recognized the role of peer perceptual processes that determine who becomes a leader (Lord, Brown, Harvey, & Hall, 2001; Neubert & Taggar, 2004; Taggar et al., 1999). Traits theories of leadership argue that people who are perceived

as leaders endorse specific traits which match perceivers' leadership prototype or exemplar. "[I]f a target individual's traits strongly match the perceiver's leader prototype or exemplar, that individual is more likely to be viewed as a leader" (Neubert & Taggar, 2004: 177). I therefore collected several individual traits argued to facilitate their emergence (Appendix).

*Cognitive Abilities.* Grade point average (GPA) was used as a proxy for cognitive abilities (Valacich, Jung, & Looney, 2006). Prior work had demonstrated a consistent positive relationship between intelligence and leadership emergence (Lord, de Vader, & Alliger, 1986; Taggar, Hackett & Saha, 1999). (Mean=3.45; SD=0.27; Q3=3.69).

*Emotional Abilities.* Participants' emotional ability was assessed by completing the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT, Mayer, Caruso, & Salovey, 2000; Mayer, Salovey, & Sitarenios, 2003; Mayer, Roberts, & Barsade, 2008). The MSCEIT is an ability-based test designed to measure the four branches of emotional intelligence: perceiving, using, understanding, and managing emotions. Throughout the test, respondents are asked to identify the emotions expressed by a face or in designs, to generate a mood and solve problems with that mood, to define the causes of different emotions, to understand the progression of emotions, and to determine how to best include emotion in our thinking in situations. Previous research has shown people with greater empathy (i.e., the ability to perceive other's emotions as if they were one's own) are more likely to emerge as leaders (Kellet et al., 2002, 2006; Wolff, Pescosolido, & Druskat, 2002). (Mean=96.73; SD=13.10; Q3=105.73).

*Social Abilities.* Self-Monitoring assesses one's concern with the social appropriateness of one's actions, the use of social comparison information, and the ability to monitor one's behavior to fit different, and specific, situations (Snyder, 1974). Because high self-monitors are more skilled at

social interactions (Furnham & Capon, 1983) and are more likely to use collaboration and compromises to resolve conflicts (Baron, 1989), high self-monitors tend to emerge as leaders (Zaccaro, Foti, & Kenny, 1991; Mehra et al., 2001). Self-monitoring was assessed using the Snyder's (1974) 25-item questionnaire which asks respondents to note whether or not each statements is a true representation of his/her own personal behavior. (Mean=12.69; SD=3.23; Q3=15).

*Group identification* (GID) provides an indication of the propensity of an individual to identify with his or her social groups (Hogg & Hains, 1996). Authors like Levine and Moreland (2006: 384) suggest that "leadership may be a structural feature of in-groups that is generated by group belongingness". In other words, because individuals who identify highly with the group tend to develop a strong sense of attachment as well as positive relationships with others, they are more likely to be perceived as leaders by the rest of the group (Hogg, 2001; Van Vugt & De Cremer, 1999). GID measure consisted of a 6-items scale developed by Hogg and Hains (1996). (Mean=33.45; SD=4.99; Q3=37).

*Self-esteem* is a term used in psychology to reflect a person's overall evaluation or appraisal of his or her own worth. Research suggests that people with higher self-esteem tend to be perceived as leaders by their group (Andrews, 1984; Hill & Ritchie, 1977). To assess participants' self-esteem, I administer the Rosenberg Self-Esteem Scale (RSES), an uni-dimensional instrument which captures subjects' global perception of their own worth and importance, that is, a global positive or negative attitude toward oneself (Rosenberg, 1989). The test uses a 10-item scale, five positively worded items and five negatively worded items (Martín-Albo, Núñez, Navarro, & Grijalvo, 2007). (Mean=34.06; SD=3.54; Q3=37).

*Self-view of leadership.* Participants were asked to assess their self-view of leadership at each time period: “How much of a leader did you see yourself as when it came to travel in the past month?” Respondents answered using a five-point scale ranging from “not at all” to “extremely.” This type of self-report measure has been shown to be a reliable way of measuring leader self-perception (Amit, Popper, Gal, Mamane-Levy, & Lisak 2009; Bugental & Lehner, 1958; Van der Mescht, 2004).

*Gender.* As previous research repeatedly confirmed that men emerge as leaders when the activity is task-oriented whereas women emerge as leaders when the activity is socially oriented, I controlled for gender effects (Carli & Eagly, 1982; Wentworth & Anderson, 1984). The gender was coded in a binary variable (1 for female and 0 for male).

## SUMMARY

This chapter provides an overview of the methodological approaches employed in this dissertation, i.e. model for longitudinal network analysis and exponential random graph model. Subsequently, an overview of sample and measures was offered. The remaining chapters of this dissertation will use the methodologies and sample described above to address their respective research question.

## CHAPTER 4 - EMERGENT LEADERS: RESULT FROM A GROUP PROCESS?

*We investigate the interdependence between group members' leadership perceptions and ways in which macro group contexts constrain these perceptual processes. By focusing on patterns of leadership perceptions, we envision leadership emergence as more than individual decisions taken in isolation: we suggest that individuals' leadership perceptions are constrained by the structure emerging at the group level. People, when nominating a leader, do not search for "great men" only: they also are constrained by the choice of others, i.e., by patterns in leadership nominations. We represent leadership as a network and conduct a longitudinal analysis to identify structural effects ruling the evolution of such leadership networks.*

### INTRODUCTION

A growing body of research has examined emergent leadership within groups (Foti, Knee, & Backert, 2008; Guastello, 2007; Karakowsky & Siegel, 1999; Kellet, Humphrey, & Sleeth, 2002, 2006; Mehra, Kilduff, & Brass, 2001; Neubert & Taggar, 2004; Taggar, Hacket, & Saha, 1999; Wolff, Pescosolido, & Urch Druskat, 2002). Emergent leadership is defined as a *process* during which some individuals, over time and through social interaction, are recognized, and accepted as leaders by the group (Hollander, 1964). Somewhat surprisingly, the bulk of extant research has devoted attention to the study of leaders, not to the process of leadership emergence.

Leadership studies have traditionally been leader-centered, i.e. focused on the individual leaders (Wood, 2005). Leader-centered theories can be categorized into three broad categories: trait, behavioral, and contingency (Kayworth & Leidner, 2001-2002; Lord, 1977; Yoo & Avali, 2004).

Traits theories of leadership argue that people who are perceived as leaders endorse specific traits which match perceivers' leadership prototype or exemplar. Such traits include extraversion (Judge, Bono, Ilies, & Gerhardt, 2002), cognitive intelligence (Lord, de Vader, & Alliger, 1986; Taggar et al., 1999), empathy (Kellet et al., 2002, 2006; Wolff et al., 2002), and self-monitoring (Mehra et al., 2001; Zaccaro, Foti, & Kenny, 1991). Behavioral approaches to leadership are based on an individual performing particular behavior. Studies identified two broad types of leadership behaviors: task-oriented versus people-oriented behavior (Bass, 1990; Yoo & Avali, 2004). Contingency theories of leadership recognize the role of context and situational factors in the effectiveness of leadership behaviors and therefore facilitating the process of leadership emergence. This theory assumes that different situations call for different leadership behaviors. According to the theory, the style adopted by an emergent leader is in large part dependent upon attributes of other members (Sheridan, Vredenburg, & Abelson, 1984), and market stability or turbulence (Bass & Barrett, 1981).

Work in all three streams of leadership research has greatly contributed to our understanding of how the traits and behaviors of individuals affect their chances of emerging as leaders within a group. Recently, however, scholars have emphasized that the process of leadership emergence entails complex dynamics of "social construction" whereby a group's members progressively converge towards a collective definition of a leadership hierarchy (Mehra, Smith, Dixon, and Robertson 2006). This view suggests that much could be learned by refocusing leadership research in two ways. First, attention should shift from the traits and behaviors characteristic of leaders, to the process of social construction through which such individuals get to be perceived as leaders by the group (Day, Gronn, and Salas 2004, 2006; Moregeson, DeRue, and Karam, 2009). Second, leadership should be conceptualized as shared, or distributed, across a number of individuals, rather

than being focused in a single leader (Gronn 2002; Pearce, Conger, and Locke 2007; Mehra et al. 2006).

The model of distributed leadership envisions leadership as an inter-personal, multilevel phenomenon constructed by all group members. As a result, several individuals can be recognized as leaders (Mehra et al., 2006). To represent patterns of distributed leadership, scholars adopt a sociometric approach: people's perceptions of leaders are "mapped" onto a network (Carson, Tesluk, & Marrone, 2007; Mehra et al., 2006). By capturing simultaneously individual, dyadic, and group levels of analysis, leadership networks answers leadership scholars' call for studies using advanced, complex, and inclusive conceptualization of leadership (Day & Harrison, 2007; Kickul & Neuman, 2000; Livi, Kenny, Albright, & Pierro, 2008; Yammarino, Dionne, Chun, & Dansereau, 2005). Interestingly, although distributed leadership was used to investigate team performance from a static perspective (Mehra, Dixon, Brass, & Robertson 2006; Carson, Tesluk, & Marrone, 2007), studies on how distributed leadership evolves over time or the factors influencing this evolution have not been examined.

In this paper, we conduct a *longitudinal analysis* of networks of leadership perceptions to reveal how emergent leadership is a socially constructed phenomenon. We will show how leadership emergence is not dependent on the leader's characteristics only: great men are constrained by the dynamic interplay between the individuals within a team and by the emerging structure of leadership nominations within a group. The social construction of leadership suppose that, as individual perceptual processes are embedded in the broader group or organizational context (Foti et al., 2008; Lord, Brown, & Harvey, 2001; Lord, Brown, Harvey, & Hall, 2001), individual leadership perceptions are interdependent. Who other group members do (or do not) perceive as a leader may be a source of information which can influence one individual's leadership perception and,

ultimately, affect the group process of emergent leadership. In other words, we suggest that individuals' leadership perceptions are influenced by other group members' perceptions and by the structure of perceptions emerging at the group level.

If leadership perceptions are socially constructed, we need to examine how such interdependence occurs. As in other social relationships, we argue that, when someone is perceived as a leader, individuals rely on relational schemas to interpret patterns of leadership perceptions formed by other group members. Relational schemas enable people to interpret complex social information, fill in missing data by supplying default options, and categorize events, things, people, interactions, and other stimuli into familiar categories (Isenberg, 1986; Kilduff, Crossland, Tsai, & Krackhardt, 2008). To reveal the relational schemas involved in the process of leadership emergence, we will assess the emergent characteristics (in terms of structure or patterns) formed in dynamic, emergent network of leadership perceptions within a group (Study 1) and test directly whether the schemas that emerged empirically through the social network analysis are also perceived by group members as likely to determine emergent leaders (Study 2).

Our research makes two contributions. First, we evaluate whether leadership perceptions are interdependent and whether relational schemas influence the identification of an emergent leader. In essence, when group members nominate a leader, they do not search for great men only, but are constrained by the choice of others, and by patterns in leadership nominations. Second, we adopt an innovative research design to reveal the relational schemas involved in leadership emergence: We conduct a longitudinal assessment of networks of leadership perceptions in two undifferentiated groups. We analyzed empirical data using actor oriented models (Snijders, 2005, 2006, 2009), which examine how networks evolution is driven by social actors (Snijders, 2005, 2006, 2009; Snijders, Steglich, & van de Bunt, 2010). By tracking leadership networks over time and by modeling their

evolution using actor oriented models, we (i) captured the complexity of the dynamic evolution of leader emergence, and (ii) accounted for dynamic information about pattern of leadership within the group (dynamic network effects) and for individual characteristics influencing network dynamics.

## THEORETICAL BACKGROUND

Individuals rely on certain rules, or schemas, to help them represent, or imply, relations between abstract and specific actors (Kilduff et al., 2008; Ridgeway, 2006). Prior research suggests that people rely on several relational schemas to encode, learn, and accurately perceive their social network: (i) the *balance schema* (Newcomb, 1968) signals that individuals perceive friendship relations as reciprocal and transitive (Krackhardt & Kilduff, 1999), (ii) the *linear-ordered schema* (DeSoto & Kuethe, 1959) signals people to view influence relationships as asymmetric and transitive, (iii) *structural hole* schema (Janicik & Larrick, 2005) suggests that people with experience of disconnected networks (structural holes) were better at perceiving the potential to bridge across structural holes, finally (iv) the *small-world schema* (Kilduff et al., 2008) cues people to organize their perceptions of friendship network in clusters and connecting the clusters. As for all social relationships, emergent leadership is an extensive and complex process which involves people who, over time and social interactions, coordinate with each other so that their action, affect, identity, and evaluation are complementary and consistent (Fiske, 1999; Neubert & Taggar, 2004). We argue that emergent leadership results from group members who consistently search for hierarchy when they nominate a leader: by encoding, representing, and inferring the social process of leadership emergence, group members coordinate with each other in order to construct a social order distinguishing emergent leaders from followers.

The idea that relational schemas drive emergent leadership has been indirectly suggested by Fiske (1991, 1992) who proposes four basic relational structures, or relational elemental relationship schemas (Fiske & Tetlock, 1997), that are cognitive sources for generating social action, making sense of others' social behaviour, and coordinating and evaluating social interaction (Haslam, 1994). According to Fiske, *Authority Ranking* relationships generates and gives motivational and normative forces to organize particular relationships such as leadership. Authority ranking states that people aim at creating and occupying asymmetric positions in a linear hierarchy (Fiske, 1991, 1992; Haslam & Fiske, 1999). When a relationship is guided by authority ranking, group members “pay attention to their respective positions on the appropriate dimension” (Robbins & Boldero, 2003: 60).

We extend Fiske’s relationship schemata by arguing that precise relational schemas will guide group members in their efforts to create a hierarchy structure of leadership. More precisely, we propose three relational schemas: at the dyadic, triadic, and group levels of analysis. The guidance offered by the hypothesized relational schemas has two implications. First, it implies that people act consistently with their beliefs, values, and perceptions (Festinger, 1957). In that sense, developing consistent leadership perceptions require people to follow basic patterns, or rules, to create an emerging order. People will not perceive individuals as leaders if that perception contradicts the hierarchy implied in leadership emergence. Second, the shared use of implicit hierarchical schemas implies that group members also may infer the structure of the leadership hierarchy and adjust their leadership perceptions to fit with the overall group hierarchy. In the following sub-sections, we discuss the different relational schemas hypothesized to rule leadership emergence.

*Dyadic Level: Asymmetry*

Asymmetric interactions typically occur between non-equal individuals who respond with dissimilar, but complementary, behaviour (Blau, 1964; French, Waas, Stright, & Baker, 1986). Leadership distinguishes those who aspire to lead from those who choose to follow (Kouzes & Posner, 2004), and is an asymmetric relationship (Fernandez, 1991), based on precedence, hierarchy, status, and deference (Haslam, 1994).

The first schema is the absence of reciprocity, or asymmetry, in leadership perceptions. People are unlikely to reciprocate leadership perception. If actor i perceives actor j as a leader, then j will be induced to not perceive i as a leader. Reciprocating would be inconsistent with the nature of the social position, or status, attributed by leadership nomination: someone who is perceived as a leader will not recognize the follower as having the same status. By not reciprocating, the emergent leader maintains his or her position in the hierarchy. This simple dyadic schema is the initial constituent of hierarchy creation.

Hypothesis 1: *Leadership emergence is negatively driven by the tendency toward reciprocity.*



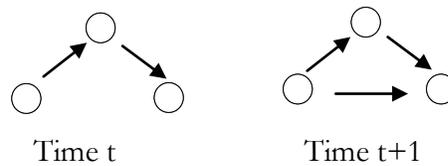
*Triadic Level: Transitivity and Absence of Cycle*

Work on transitivity, or intransitivity, has furthered our understanding of the emergence of group structure (Hallinan & Kubitschek, 1988; Hallinan, 1982). Offstein, Madhavan and Gnyawali (2006) argue that triads are formed and exist to fulfill either competitive or collaborative motives

depending on the content and nature of the relation. Research indicates that individuals rely on a basic relational schema when encoding, representing, and inferring influence relationships: the linear-ordered schema (DeSoto & Kuethe, 1959). This schema is a cognitive structure that signals to people that relations are asymmetric and transitive (DeSoto, 1960; Janicik & Larrick, 2005). It guides individuals into constructing a local hierarchy: Some people are perceived as influential while others are not.

We believe that the linear-ordered schema will play an important role in leadership emergence. If actor *i* perceives actor *j* as a leader, and actor *j* perceives actor *h* as leader, then *i*, who is capable of perceiving and making sense of *j*'s perception, will be induced to perceive *h* as a leader. Actor *i*'s choice to nominate actor *h* as a leader is consistent with the fact that actor *h* detains higher status. Therefore, we hypothesize:

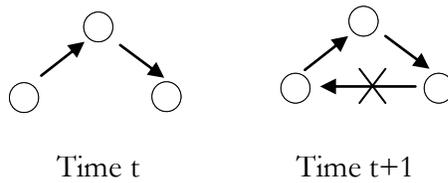
Hypothesis 2: *Leadership emergence is positively driven by the tendency toward transitivity.*



While Hallinan and Kubitschek (1988) suggest studying intransitivity at the individual level, when focusing on the person experiencing the intransitive relationship (actor *i* in the previous example), we argue that another actor has an important role to play in the intransitive *ijh* triplet. Actor *h*, by its structural position, has a greater status than actors *i* and *j* because this actor (*h*) has the possibility to maintain the hierarchy formed by the intransitive triplet or to weaken it by recognizing actor *i* as a leader. We believe that the linear-ordered schema implies the absence of cyclic relationships. If actor *i* perceives actor *j* as a leader and *j* perceives actor *h* as leader, then actor

h will not perceive actor i as a leader. Since actor h is capable of observing and interpreting the linear ordering between actors i, j, and h, and to deduce that he or she retains the higher status, he or she will not nominate actor i as a leader because he or she is lower in the hierarchy. This mechanism aims at maintaining the hierarchy.

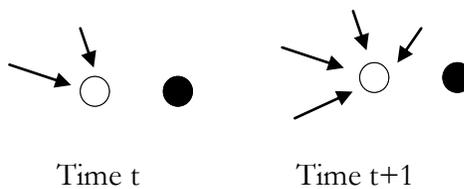
Hypothesis 3: *Leadership emergence is driven by a tendency to avoid cycles.*



*Group Level: Centrality Schema*

Leadership emergence may not follow a perfect linear ordering: multiple leaders may emerge in groups. According to Janicik and Larrick (2005), the network variable of *centrality* could correspond to a schematic representation used to encode such people in social context. In the context of leadership emergence in an undifferentiated group, we believe that the importance of the centrality schema is reinforced: highly popular actors in terms of leadership nominations will be more likely to reinforce their social position as leaders over time. “[A]n emerging leader who is perceived to be popular may benefit from a bandwagon effect: people may want to associate with someone perceived to be a rising star” (Balkundi & Kilduff, 2006).

Hypothesis 4: *Leadership emergence is positively driven by the tendency toward popularity.*



## EMPIRICAL ANALYSIS OF DYNAMIC LEADERSHIP NETWORKS

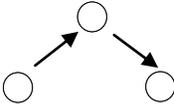
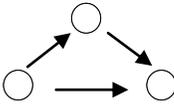
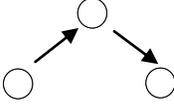
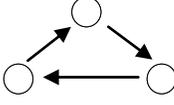
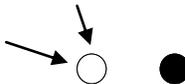
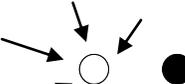
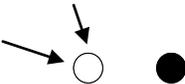
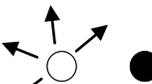
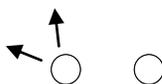
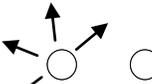
To evaluate our hypotheses, we conducted a longitudinal analysis of two empirical leadership networks: class-related and relationship-oriented-leaders. We examined two distinct leadership networks to assess the robustness of the hypotheses across two leadership behaviors. Actor oriented models were specified as described.

### *Model Specification*

To test our hypothesis, we included key five network structures. Reciprocity (H1) captures the tendency toward reciprocation. Transitive triplets (H2) is the classical representation of network closure by the number of transitive triplets. Transitivity of a relation means that when there is a tie from *i* to *j*, and also from *j* to *h*, then there is also a tie from *i* to *h*. Restated in our context, if actor *i* perceives actor *j* as a leader, and that actor *j* refers actor *h* as being a leader, then actor *i* will also nominate actor *h* as a leader. Three-cycles (H3) denotes the tendency for a relationship to be cyclical and measures “anti-hierarchical closure” (Snijders, van de Bunt, & Steglich, 2009: 21). Indegree-Popularity (H4) captures the tendency for popular actors, i.e., individuals who receive an elevated number of ties (i.e., high indegree), to become more and more popular over time. A “positive in-degree popularity effect implies that high in-degrees tend to reinforce themselves, which will lead to a relatively high dispersion of the indegrees (a Matthew effect in popularity as measured by indegrees)” (Snijders et al, 2009: 12). In our models, popularity is an important parameter as it captures the emergence of leaders over time: popular actors are individuals who receive more and more leadership nominations over time.

We also included, as controls, two other structural effects: *Indegree-Activity* and *Outdegree-Activity*. While the first parameter reflects tendencies for actors with high in-degrees (high number of

incoming ties, i.e., receiving leadership nominations) to send out extra outgoing ties 'because' of their high current in-degrees, the second parameter captures the tendency for nodes with high outdegree (higher number of outgoing ties, i.e., sending leadership nominations) to send out extra outgoing ties 'because' of their high current outdegree. A summary of the reported structural effects are represented in Table 4.

<i>Structural Effect</i>	<i>Time t</i>	<i>Time t+1</i>	<i>Description</i>	<i>Expected</i>
Reciprocity			Tendency towards reciprocation.	H1. Negative.
Transitivity			Tendency towards transitivity	H2. Positive.
Cycles			Tendency towards cyclic formations.	H3. Negative
Indegree Popularity			Nodes with higher indegree will have an extra propensity to receive ties	H4. Positive.
Indegree Activity			Nodes with higher indegree will have an extra propensity to form ties	Control
Outdegree Activity			Nodes with higher outdegree will have an extra propensity to form ties	Control

**Table 4** – Summary Structural Effects

*Control Variables.* Although network ties are characterized by well known tendencies to self-organize into a variety of local structures, leadership emergence cannot be explained by structural effects alone. Leadership emergence is inherent not only in individual differences (trait theories of leadership), but also in the relations among individuals such as friendship or frequency of social interactions (relational approach to leadership - Fernandez, 1991; Schuttle & Light, 1979). We include measures of some individual difference factors for participants' cognitive, social, and emotional abilities.

Prior research had demonstrated a consistent positive relationship between intelligence and leadership emergence (Lord, de Vader, & Alliger, 1986; Taggar, Hackett, & Saha, 1999). Cognitive abilities were represented by participants' Grade Point Average (GPA) (Valacich, Jung, & Looney, 2006). Self-monitoring evaluates one's assessment of situational cues for social appropriateness (Snyder, 1974). Studies revealed that high self-monitors are more likely to emerge as leaders (Zaccaro, Foti, & Kenny, 1991; Mehra, Kilduff, & Brass, 2001). Empathy, the emotional ability to perceive and assess accurately emotions in oneself, in others, and in groups, is viewed as important in leadership emergence (Wolff, Pescosolido, & Druskat, 2002) and was assessed using the Mayer Salovey Caruso Emotional Intelligence Test (MSCEIT - Mayer, Salovey, & Caruso, 2004; Mayer, Roberts, & Barsade, 2008). We also control for gender (Karakowsky & Siegel, 1999) and group effects. Finally, we controlled for the effect of two independent networks on the emergence of leaders: initial friendships and social interactions. The initial friendship network was assessed at the beginning of the study abroad program by asking participants who they considered friends. In this particular network, a tie would be present between actor  $i$  and actor  $j$  if actor  $i$  saw actor  $j$  as a friend. This time-constant network was included to control for the impact of previous friendships on the subsequent perception of leaders. Guided by Lord's theory which states that leadership perception is

strongly linked to frequency of social interactions (Lord, 1977), we added a dyadic covariate representing participants' frequency of social interactions. At four points in time, participants were also asked about the amount of time they spent with each other during their free time. In this social interaction network, a tie between actor *i* and actor *j* meant that these two actors spent a significant amount of time together.

### *Results*

Table 5 contains our final models reporting parameter's coefficient and standard deviation. Positive and significant parameters suggest that network evolution is driven by the tendency captured by the parameter. For example, our models reveal that higher self-monitors and people with higher GPA are more likely to emerge as people and task-oriented leaders respectively: they are more likely to receive an increasing number of leadership nominations over time.

When controlling for individual traits and frequency of social interactions, we find evidence supporting our hypotheses 2, 3, and 4, but not hypothesis 1. Leadership emergence is guided by certain patterns which consistently create a linear ordering within the group. Snijders et al. (2009) state that the transitive triplets and three-cycle effects both represent closed structures, but, whereas the former is in line with a hierarchical ordering, the latter goes against such an ordering. Therefore, "if the network has a strong hierarchical tendency, one expects a positive parameter for transitivity and a negative for three-cycles" (Snijders et al., 2009: 12). This is the case in the leadership networks. We find strong tendency toward transitivity (H2 - Positive parameters  $\beta_{Transitivity}$ ). Non-hierarchical structures as cycles did not rule the emergence of leaders (H3 - Negative parameters  $\beta_{3-cycles}$ ). Taken together, the triadic effects of transitivity and three-cycles suggest that local hierarchy between nodes in the network emerges over time.

	<i>People Leaders</i>		<i>Class Leaders</i>	
	coeff.	s.e.	coeff.	s.e.
Outdegree	-1.113 ***	(0.340)	-1.248 ***	(0.317)
Reciprocity	0.580 ***	(0.105)	0.279 ***	(0.102)
Transitive Triplets	0.142 ***	(0.043)	0.052 *	(0.029)
3-cycles	-0.048	(0.037)	-0.035	(0.036)
Indegree – popularity	0.036 ***	(0.003)	0.034 ***	(0.002)
Indegree – activity	-0.084 **	(0.039)	-0.008	(0.009)
Outdegree – activity	0.048 ***	(0.006)	0.032 ***	(0.007)
Friends at time 0	0.239 ***	(0.066)	0.195 ***	(0.062)
Social interactions	0.155 ***	(0.018)	0.089 ***	(0.016)
Gender	0.055	(0.080)	-0.141	(0.109)
GPA	0.052	(0.103)	0.380 ***	(0.102)
Group	0.014	(0.066)	0.043	(0.048)
Empathy	-0.003	(0.002)	0.002	(0.002)
Self-Monitoring	0.008 **	(0.003)	0.007	(0.007)

**Table 5** - Longitudinal Analysis of Leadership Networks

Finally, and most importantly, we find a strong and positive popularity effect in both models (H4 - Positive parameters  $\beta_{Indegree-Popularity}$ ), which implies that high in-degrees reinforce themselves. Leaders in the group tend to become more popular over time. This degree-related effect illustrates that leadership emergence did take place in our samples, and leaders reinforced their leadership positions over time.

Finally, our two structural controls (*Indegree-Activity* and *Outdegree-Activity*) reveal that leadership networks are ruled not only by local hierarchy (as illustrated by the triadic effects), but also global hierarchy. Snijders et al. (2009: 13) state that “in a perfect hierarchy, ties go from the bottom to the top, so that the bottom nodes have high outdegrees and low indegrees and the top nodes have low outdegrees and high indegrees. This will be reflected by positive outdegree activity and negative indegree activity.” This is the case in the leadership networks.

In summary, structural properties of the networks provided clear evidence that emergent leadership is a hierarchical process guided by structural effects aiming at creating and maintaining not only a local, but also a global hierarchy among group members.

#### TESTING RELATIONAL LEADERSHIP SCHEMAS

The results from Study 1 suggest that group members apply a relational schema to determine whether an individual is an emergent leader, and that schema reflects some structural properties within the group. We conducted a second study to test directly whether the schemas that emerged empirically through the social network analysis are also perceived by group members as likely to determine emergent leaders.

Lord, Foti, and De Vader’s (1984) information processing theory of leadership views the beliefs about and attributes of an effective leader are clustered together in schemas. Hanges, Dorfman, Shteynberg, and Bates (2006) examined the characteristics that constitute a person’s leadership schemas “because the content of the leadership schema determines who is perceived as a leader and who is not” (Hanges et al 2006: 12). Although research on leader perceptions emphasized the role of schemas (Fiske & Taylor, 1991) in assessing leadership, there has been limited past work that examined directly the role of relational schemas in leadership emergence.

One study (DeSoto & Kuethe 1959) examined the likelihood of relational schemas to describe patterns of relationships. In their study, “hypothetical social structures were broken into their elementary links, each consisting of two individuals and a relation of one to the other” (Zajonc & Bumstein 1965: 570). DeSoto and Kuethe (1959) asked participants to assign probabilities to various forms of interpersonal relationships (such as friendship, trust, feeling superior to, is happier than, dislike, is afraid of, and hate). Subjective probabilities of each relationship were assessed under different conditions, with each condition representing a particular relationship between the hypothesized actors (such as the basic tendency to have a social relationship at all, symmetry, transitivity).

#### *Method*

We adapted DeSoto and Kuethe’s approach (1959) to test directly whether the schemas that emerged empirically through the social network analysis are also perceived by group members as likely to determine emergent leaders. We focused our attention on one type of relationship: “perceives as a leader,” and asked participants to assess the subjective probability of certain patterns of the relationship. For example, “Al perceives Joe as a leader. How likely is Joe to perceive Al as a leader?” All questions are reported in Table 3. We also added a temporal component to one of our hypothesized schemas: we asked if respondents were more or less likely to perceive a particular schema, i.e., centrality, occurring over time. Participants answered each question by choosing the appropriate probability on a seven-point scale ranging from “very unlikely” to “very likely” (“neither likely nor unlikely” corresponding to a 0.5 probability).

We used an online survey to collect relational leadership schemas, and 42 participants completed our questionnaire. This sample was composed of undergraduate students who participated in a study abroad program, but were not part of the data collected in study one.

*Results*

Table 6 summarizes our results as well as the questions we asked to assess each hypothesized relational leadership schema. We compared a scenario that was consistent with the relational schemas that received empirical support in the social network analysis with a schema-inconsistent scenario.

<i>Relational Schema</i>	<i>Question</i>
Reciprocity	Al perceives Joe as a leader. How likely is Joe to perceive Al as a leader?
Transitivity	Al nominates Joe as a leader. Joe nominates Frank as a leader. How likely is Al to nominate Frank as a leader?
Cycle	Al nominates Joe as a leader. Joe nominates Frank as a leader. How likely is Frank to nominate Al as a leader?
Popularity	Al nominates Joe as a leader. How likely will Frank also nominate Joe as a leader.
Popularity, Reinforcing	Al is perceived by several people as a leader. How likely is it that, over time, a greater number of people perceive Al as a leader?
Popularity, Decreasing	Al is perceived by several people as a leader. How likely is it that, over time, fewer people perceive Al as a leader?

**Table 6** - Testing Network Schemas

We find strong evidence for all our hypothesized relational schemas: respondents significantly perceived leadership as non-reciprocal ( $t = -3.94$ ;  $df = 40$ ;  $p < .001$ ;  $\bar{x} = .36$ ), transitive ( $t = 5.68$ ;  $df = 40$ ;  $p < .001$ ;  $\bar{x} = .73$ ), non-cyclic ( $t = -5.04$ ;  $df = 40$ ;  $p < .001$ ;  $\bar{x} = .30$ ), and, over time, as a reinforcing ( $t = 20.01$ ;  $df = 40$ ;  $p < .001$ ;  $\bar{x} = .91$ , for the popularity reinforcing scenario) rather than a decreasing progress ( $t = -2.15$ ;  $df = 40$ ;  $p < .05$ ;  $\bar{x} = .41$ , for the popularity decreasing scenario).

We also conducted simple paired t-tests to determine whether the relational schema scenario of transitivity and emerging popularity was perceived as more likely than the scenarios of cyclic perceptions and decreasing popularity. For the relational schema that reflects transitivity, respondents were significantly less likely to perceive a transitive relationship ( $t = 8.87$ ;  $df = 40$ ;  $p < .001$ ;  $\bar{x} = .73$  vs.  $.30$ , for the transitive and cycle scenario, respectively). Finally, for the popularity scenario, respondents were significantly more likely to view a leader as becoming more popular over time ( $t = 11.34$ ;  $df = 40$ ;  $p < .001$ ;  $\bar{x} = .91$  vs.  $.04$ ).

### *Discussion*

Our second study provides evidence that is consistent with the empirical findings in the social network analysis. First, participants did not view leadership as a reciprocal or cyclical process. The absence of symmetry and cycle suggests that people perceive leadership as a hierarchical relationship. Perceived leaders, who obtain a certain social status, are not expected to share their position, with a perceived distinction between leaders and followers. We also find strong evidence that people perceive leadership relationships as transitive. As it is the case for influence relationship (DeSoto & Kuethe 1959), if actor  $i$  perceives actor  $j$  as a leader, and that actor  $j$  refers actor  $h$  as

being a leader, then people expect actor *i* to also nominate actor *h* as a leader (the boss of my boss is my boss). Again, this mechanism reveals a tendency for people to see leadership as hierarchical ordering. Finally, we obtain clear results that people perceive leadership as a positive reinforcing process in which emergent leaders not only maintain their social status but reinforce it. In their mental representation of leadership, people envision emergent leaders as gaining more authority over time, i.e, receiving greater number of nominations over time. Interestingly, they strongly reject the idea that leaders may lose their social position over time.

To sum up, we find strong evidence supporting all our hypothesized relational schemas. More interestingly, this study reveals that people consistently search for hierarchy in leadership choice perceptions.

## CONCLUSION

As individual perceptual processes are embedded in the broader group or organizational context (Fonti et al., 2008; Lord, Brown, & Harvey, 2001; Lord, Brown, Harvey, & Hall, 2001), we argue, and demonstrate, that group member' leadership perceptions are shaped by the broader pattern of leadership perceptions emerging at the group level (Fonti et al., 2008; Lord et al., 2001). As emphasized by Balkundi and Kilduff (2006: 423), "that implicit leadership theories may be triggered by the structural position of certain individuals in the eyes of others is a possibility hinted at in recent leadership theory (Lord & Emrich, 2001), but yet to be systematically examined". In our structural approach to leadership emergence, we do not focus on the impact of a leader's position within informal networks on leadership emergence but on the emergent characteristics (in terms of structure or patterns) formed in dynamic, emergent network of leadership perceptions within a group (Mehra et al., 2006).

The actor-oriented models performed on two distinguished leadership networks (class vs. people-leaders) revealed that, when controlling for leadership traits, behaviors, and social interactions, leadership networks were affected by the tendencies toward transitivity, non-cycles, and reinforcing popularity. These findings suggest that group members' leadership perceptions, although "ultimately a micro-level, psychological process that involves a single individual's perception of a potential leader" (Fonti, Knee, & Backert, 2008: 179), are interdependent and affect the progress of emergent leadership. Who other group members do (or do not) perceive as a leader may be a source of information which can influence one individual's leadership perception and, ultimately, affect the group process of emergent leadership. The SIENA models also suggest that leadership emergence is a hierarchical process guided by structural effects aiming at creating and maintaining not only a local, but also a global hierarchy among group members. When testing for leadership schemas, we find evidence consistent with the empirical findings in the social network analysis. Our analysis illustrates the tendency for people to see leadership as hierarchical ordering: in people's mind, emergent leadership is perceived as a hierarchical process in which emergent leaders not only maintain their social status but reinforce it.

We demonstrated that, in order to understand *how leadership emerges* in an undifferentiated group, patterns of leadership perceptions among group members need to be considered. We evaluated whether individual leadership perceptions are constrained by other group members' perceptions and by the structure of perceptions emerging at the group level and whether relational schemas influence the identification of an emergent leader. In essence, when group members nominate a leader, they do not search for great men only, but are constrained by the choice of others, and by patterns in leadership nominations.

## **CHAPTER 5 - EMERGENT LEADERS: PERCEIVE THEMSELVES AS LEADERS?**

*While it is often assumed that an individual's self-view as a leader has an impact on that individual's emergence as a leader, there is currently no empirical evidence of this effect in the literature. The following paper uses longitudinal social network analysis to study both the impact of an individual's self-view as a leader on leadership emergence and how the process of leadership emergence influences an individual's self-view as a leader over time. Our results suggest a reciprocal process: an individual's self-view as a leader influences the number of leadership nominations the individual receives over time, and the number of leadership nominations received over time influences an individual's self-view as a leader.*

### **INTRODUCTION**

“You can be a leader if you see yourself as a leader” – General Schwarzkopf

Emergent leadership is a dynamic social process during which individuals with no formal authority become leaders (Durham, Knight, & Locke, 1997; Neubert & Taggar, 2004). The process of leadership emergence is based on the group's acceptance and recognition of an individual as a leader and depends “upon the individual, the followers, the situation, or an interaction between or among these components” (Mahar & Mahar, 2004, p. 6). Prior work has identified several individual-level characteristics associated with emerging leaders, such as gender, self-esteem, self-monitoring, cognitive skills, and emotional abilities (Mehra, Kilduff, & Brass, 2001; Kellett, Humphrey, & Sleeth, 2002, 2006). Another individual characteristic that warrants examination is an

individual's self-view as a leader. Leadership scholars have recently recognized that self-conception as a leader is an important part of development as a leader (van Knippenberg & Hogg, 2003; van Knippenberg, van Knippenberg, De Cremer, & Hogg, 2004; Lord & Hall, 2005). However, despite acknowledgement from scholars of a relationship between self-view as a leader and leadership emergence, this assumption has never been tested. No quantitative studies to date have examined how an individual's self-view as a leader impacts leadership emergence.

The purpose of the current study is three-fold. First, we test the claim that “you can be a leader if you see yourself as a leader” by examining if one's self-view as a leader translates into leadership emergence. We argue that individuals who perceive themselves as leaders are more likely to receive leadership nominations over time. Second, we examine the impact that emerging as a leader has on one's self-view as a leader. We argue that, as individuals become more “popular” in terms of leadership nominations (i.e., emerge as a leader for the group), their perceptions of themselves as leaders are more likely to increase. Finally, we examine how this process evolves over time. We argue that an individual's self-view as a leader and an individual's leadership emergence reinforce each other, and both of these effects become stronger over time.

As the first study to model the reciprocal effects of self-view as a leader and leadership emergence, our research makes two contributions. First, we report empirical evidence that self-view as a leader and leadership emergence are closely related social processes. These findings bring an additional piece of evidence to research in leadership, self, and identity by illustrating how self-view as a leader and leadership emergence co-evolve and reinforce each other over time. Second, this study is the first to perform a longitudinal analysis on leadership networks to investigate the emergence of informal leaders in a natural, leaderless group. A network representation of leadership offers a more realistic picture of how leadership roles are shared among group members by

including all group members, revealing emergent leaders, and capturing patterns of tie formation. We captured leadership networks for two cohorts at four points in time. We used actor oriented models to investigate how the leadership networks evolved over time. This approach allowed us to take into account (1) the patterns of tie formation ruling network evolution, (2) the individual characteristics and behaviors affecting network dynamics, and (3) the influence of the networks on behavior. We believe this analytic strategy answers Ibarra, Kilduff, and Tsai's (2005) call for research on how social identity affects networks and how networks shape social identity by investigating how leadership emergence in a network and social identity (self-view as a leader) co-evolve over time.

## THEORETICAL BACKGROUND

### *The Impact of Self-View as a Leader on Leadership Nominations from Peers*

The term “self-concept” appears frequently in contemporary social science. Despite varying uses of the term across disciplines, scholars agree the “self-concept” represents the “totality of the individual's thoughts and feelings having reference to himself as an object” (Rosenberg, 1979, p.7). Self-concept can include both current and future or “possible” selves, which represent individuals' ideas of what they might become, would like to become, or are afraid of becoming (Markus & Nurius, 1986). Psychologists have long noted the stability of the self-concept and the existence of processes that operate to perpetuate one's self-concept (James, 1890).

Self-concept is often examined as an antecedent to behavior. When individuals view themselves (i.e., the role or characteristics they see themselves as having) in a certain way, they act in a way consistent with that perceived self. This causal pattern has been documented across a variety of literatures. In marketing, self-concept has been shown to motivate the purchase of certain brands, which serve a symbolic function (Grubb & Grathwohl, 1967). Psychologists have predicted behavior

from the Big Five personality dimensions related to the self-concept (Back, Schmukle, & Egloff, 2009). In the education field, self-concept has been demonstrated as an antecedent to academic achievement and performance outcomes (Midkiff, Burke, Hunt, & Ellison, 1986; Nicholls, 1979). Within the health domain, prior physical self-concept has been found to impact exercise behaviors (Marsh, Papaioannou, & Theodorakis, 2006). Research across a variety of fields suggests that self-concept leads to the performance of behaviors or attainment of an external state that is consistent with internal self-view.

The leadership literature also references the self-concept construct. Shamir, House and Arthur (1993) showed that charismatic leaders have a transformational effect on their followers by engaging followers' group mission-relevant self-concepts. Hogue and Lord (2007) suggested that gender bias in leadership operates through women leaders' self-concepts as females, and that aspects of this self-concept have limiting effects on their leadership activities.

The interplay between self-concept and behavior has not been explicitly tested in the leadership field. However, several authors have conjectured that this relationship underlies leadership emergence. Lord, Brown, and Freiberg (1999) indicated that the self-identity that leaders create can have important implications for their followers' behavior, as well as on their followers' leadership perceptions. Van Knippenberg et al. (2004, p.498) pointed out that the "self and identity perspective may be fruitfully applied to understand leadership effectiveness from the angle of the leader (rather than follower) perspective...[and a]n important source of such behaviors may be leader self-conception." Recently, Lord and Hall (2005) suggested that identifying oneself as a leader, and therefore adopting a provisional leadership identity, facilitates leadership emergence.

The relationship between an individual's self-concept as a leader and corresponding actions has never been the object of empirical examination in the leadership literature, but it has often been

assumed. The process begins when an individual believes that he or she is a leader. The individual then acts in accordance with this self-concept (i.e., exhibits behaviors that are consistent with being a leader). As the individual displays behaviors associated with leadership, other group members, over time and frequency of social interaction, recognize the individual as a leader. Therefore, individuals perceiving themselves to be leaders are likely to receive a high number of leadership nominations (i.e., emerge as leaders). This is the process of leadership emergence. Based on this process of converting an internal self-concept into external behaviors, we hypothesize:

Hypothesis 1: *The stronger an individual's self-view as a leader, the more leadership nominations the individual receives over time.*

#### *The Impact of Leadership Nominations from Peers on Self-View as a Leader*

A theoretically central idea in social psychology is the notion of the self as a social product, or the idea that the self is “not discovered absent of others, but is constituted in relation to others” (Sparrowe, 2005, p. 421). Cooley (1902, p. 183) argued that inter-subjectivity is the social process that shapes the individual self: “in imagining we perceive in another’s mind some thought of our appearance, manners, aims, deeds, characters, friends, and so on, we are variously affected by it.” This process is commonly termed the “looking glass self,” implying that one’s self-concept is the internalization of others’ conceptions of the individual. Social identity, a theoretical framework explicating the relationship between identity, group, and intergroup phenomena (Hogg, 2001a, 2001b, 2003; Hogg & Terry, 2000), also incorporates the idea of the looking glass self. The key assumption of social identity theory is that group membership defines one’s identity (van Knippenberg & Hogg, 2003) through internal and external feedback extracted from social interactions within groups (Ashford, Blatt, & Vandewell, 2003; Cooley, 1902; Goffman, 1959). As

noted by Ibarra (1999), “people make identity claims by conveying images that signal how they view themselves or hope to be viewed by others. By observing their own behavior as well as the reactions of others, who accept, reject, or renegotiate these public images, they maintain or modify their private self-conceptions” (p. 766).

The self as a social construction has guided research in various areas, including religion (Shaffer, 2008), immigrant identity (Wiley, Perkins, & Deaux, 2008), and sibling interaction (Gamble & Yu, 2008; Van den bergh, 2006). This construct also operates in the leadership domain (Lord & Brown, 2004; Lord & Hall, 2005; van Knippenberg et al., 2004). Hollander (1992) noted that an individual’s leadership self-concept must be consistent with followers’ perceptions in order for the individual to fulfill a leadership role. Leaders adjust their self-concept through interactions with, and feedback from, group members (Hogue & Lord, 2007; Lord & Brown, 2004; Lord, Brown, & Freiberg, 1999; van Knippenberg et al., 2004). Similarly, Lord and Hall (2005, p. 596) state that social processes “serve to validate the leader’s self-view as a leader. If attempts at leadership are not accepted by others, then it may be much more difficult to establish a self-view as a leader.”

We believe that the looking glass self also plays a particular role in leadership emergence. Leadership emergence is a process in which a cluster of people come to view particular individuals as leaders within their group. During the leadership emergence process, the group-selected leaders realize that others perceive them as such. This perception of designated position leads them to a view themselves as leaders. Individuals who receive an increasing number of leadership nominations observe and internalize their role (Lord & Hall, 2005) and solidify their self-view as a leader. Formally, we hypothesize:

Hypothesis 2: *The more leadership nominations an individual receives, the stronger the individual's self-view as a leader becomes over time.*

*Self-Concept and Leadership Emergence: A Reciprocal Process*

Few research efforts have examined the reciprocal nature of the interactive processes between self-concept and performance. We argue that self and peer perceptions co-evolve to create a reinforcing mechanism driving leadership emergence. People who perceive themselves as leaders are more likely to receive leadership nominations over time. As these individuals become more popular in terms of leadership nominations (i.e., more and more group members perceive them as leaders), their view of themselves as a leader strengthens. The cycle repeats and reinforces both the individual's self-view as a leader and peers' perception of the individual as a leader.

One model of self-concept and performance that formally incorporates this co-evolutionary process is the Reciprocal Effects Model (REM; Marsh, 1990, 1993; Marsh & Craven, 1997). In the REM, a "causal relationship between a specific component of self-concept...and performance in a related area...is conceived as dynamic and reciprocal" (Marsh & Craven, 2006, p. 134). Individuals who think of themselves as capable in a particular domain tend to be successful in that domain. Their success leads them to have a positive self-concept in the particular domain. Support for the REM has been found in academic achievement (Byrne, 1996; Marsh, Byrne, & Yeung, 1999), exercise behavior (Marsh, Papaioannou, & Theodorakis, 2006), and sport performance (Marsh, Chanal, Sarrazin, & Bois, 2005; Marsh & Perry, 2005).

Importing ideas from the REM into the leadership literature is interesting since the reciprocal effects of self-view as a leader and leadership emergence are often assumed but infrequently tested. If a reciprocal relationship exists between self-view as a leader and leadership

emergence, the effects should mutually reinforce each other and become stronger over time. Therefore, we hypothesize:

Hypothesis 3: *The impact of an individual's self-view as a leader on the number of leadership nominations the individual receives will become stronger over time (i.e., H1 will become stronger over time) and the impact of the number of leadership nominations an individual receives on the individual's self-view as a leader will become stronger over time (i.e., H2 will become stronger over time).*

We used a longitudinal form of social network analysis to formally test these reciprocal effects. Longitudinal social network analysis enables the examination of how the personal characteristics of individuals within a group co-evolve with the emergence of leaders in that group, while controlling for the structural effects present in a network.

#### MODELLING CO-EVOLUTION OF LEADERSHIP NETWORKS AND SELF-VIEW

Actor-based models are a longitudinal strategy for examining the interdependence between network evolution and behavior evolution. The co-evolution of network and behavior arises when relationships in the network are influenced by individuals' behaviors (a selection process) and behavior is influenced by the relationship in the network (an influence process; Snijders, 2009; Snijders, Steglich, & van de Bunt, 2010). In our study, networks referred to leadership nominations and behavior referred to self-view as a leader. The selection process represented how an actor's self-view as a leader influenced the evolution of distributed leadership. We tested whether actors who strongly perceived themselves as leaders were more likely to receive an increasing number of nominations over time (i.e., to emerge as leaders, H1). Modeling the influence process captured how an individual's self-view as a leader was affected by the network of leadership nominations. It

allowed us to test whether people who were perceived as leaders by the rest of the group saw themselves as leaders (H2).

Actor-oriented models define two dependent variables to model the interdependence of network and behavioral evolutions: a tie/network variable and a behavior variable (Snijders, Steglich, & Schweinberger, 2007; Snijders et al., 2010). The model assumes that individual actions are responsible for the evolution of networks and behavior by optimizing two objective functions. The first objective function represents an actor's evaluation of, or preference for, a certain network configuration compared to the current state of the network (Snijders, 2009). To optimize their evaluation, actors can create, delete, or maintain social ties with other actors. Similarly, actors can increase, decrease, or keep their score on a behavioral variable to maximize their behavioral objective function.

Technically, to directly model the interdependence of network and behavioral evolutions, actor-oriented models define two dependent variables: a tie/network variable and a behavior variable (Snijders, Steglich, & Schweinberger, 2007; Snijders, van de Bunt, & Steglich, 2009). The model assumes that individual actions are responsible for the evolution of networks and behavior by optimizing two objective functions. The first objective function represents an actor's evaluation of, or preference for, a certain network configuration compared to the current state of the network (Snijders, 2006). Similarly, an actor can increase, decrease, or keep his or her score on a behavioral variable (change from  $z$  to  $z^0$ ), to maximize his/her behavioral objective function,  $f_i^{Zh}(z^0, z, x^0, v, w)$ . Behavioral changes are modeled according to the following equation (notations are the same as above):

$$P_i\{\text{Change from } z \text{ to } z^0\} = \frac{\exp(f_i^{Zh}(z^0, z, x^0, v, w))}{\sum(f_i^{Zh}(z^0, z, x^0, v, w)) \text{ for } z' \in C^{Zh}(z^0)}$$

We conducted our analysis on the co-evolution of leadership network and self-view as a leader using SIENA. Parameters were estimated using the conditional method of moments.

*Leadership nominations.* Participants were required, in addition to attending classes, to visit cities in Europe. This particular requirement forced participants to travel almost every weekend during the program. It also involved organizing group travelling arrangements (transportation, lodging, booking tickets to attractions, etc). The majority of participants had never organized transportation abroad, and the task was challenging. This particular situation called for informal leaders who other group members could look to for guidance and direction on what should be done and how to do it. To identify emergent leaders at each time period, participants were asked who, in the past month, they perceived as a leader when it came to travelling. As emphasized by Mehra et al. (2006), this method of capturing leadership networks is consistent not only with the classic sociometric work on leadership in teams but also with the theoretical conception of leadership as a phenomenological construct (i.e., a leader is someone who is perceived as such by others; Calder, 1977; Meindl, 1993).

*Self-view of leadership.* Participants were asked to assess their self-view of leadership at each time period: “How much of a leader did you see yourself as when it came to travel in the past month?” Respondents answered using a five-point scale ranging from “not at all” to “extremely.” This type of self-report measure has been shown to be a reliable way of measuring leader self-perception (Amit, Popper, Gal, Mamane-Levy, & Lisak 2009; Van der Mescht, 2004; Bugental & Lehner, 1958).

*Control Variables.* Leadership emergence cannot solely be attributed to self-view of leadership. We controlled for cognitive (GPA), emotional (empathy), and social (self-monitoring)

characteristics. We also included binary variables representing gender and cohort. Finally, we controlled for several patterns of tie formation shaping the evolution of leadership networks, such as reciprocity, transitivity, cyclic ties, and popularity.

## RESULTS

To examine hypotheses 1 and 2, we modeled the co-evolution of the network and behavior across all four time periods. Results are reported in Table 7.

	<i>Travel Leaders</i>		
	coeff.	s.e.	sig.
Outdegree	-0.787	0.351	*
Reciprocity	0.518	0.086	**
Transitive Triplets	0.242	0.017	**
3-Cycles	-0.152	0.03	**
Popularity	0.019	0.004	**
<u>Social Selection</u>			
Friends Time0	0.2259	0.07	**
Gender	-0.129	0.083	†
GPA	-0.076	0.116	
Empathy	-0.003	0.002	†
Self-monitoring	0.003	0.062	
Group	0.069	0.062	
Self-View Leader	0.099	0.046	**
<u>Social Influence</u>			
Beh. Self-View linear shape	-0.065	0.152	
Beh. Self-View quadratic shape	-0.245	0.06	**
Beh. Self-View Indegree	0.040	0.02	*

\*\* p<0.01; \* p<0.05; † p<0.1

**Table 7** - Actor Oriented Models, Emergence Travel Leader

The “Self-View Leader” coefficient is positive and significant ( $\beta=0.10$ ;  $p < .01$ ). This indicates that people who strongly perceived themselves as leaders were more likely to receive

leadership nominations over time. This supports H1. The “Behavior Self-View Indegree” coefficient is also positive and significant ( $\beta=0.04$ ;  $p < .05$ ). This implies that people receiving a greater number of incoming ties (i.e., leadership nominations) have a higher view of themselves as leaders. This supports H2.

To examine our third hypothesis, (i.e., that the effects of H1 and H2 get stronger over time), we modeled the co-evolution of the network and behavior longitudinally across the four time periods. Results are reported in Table 8.

	<i>Time 1 - Time 2</i>			<i>Time 2 - Time 3</i>			<i>Time 3 - Time 4</i>		
	coeff.	s.e.	sig.	coeff.	s.e.	sig.	coeff.	s.e.	sig.
Outdegree	-0.779	0.594	*	-0.6916	0.5463		-0.4549	0.5864	
Reciprocity	0.4995	0.1513	**	0.5817	0.1426	**	0.3764	0.155	**
Transitive .Triplets	0.3004	0.0286	**	0.213	0.025	**	0.2367	0.0317	**
3-Cycles	-0.1701	0.0517	**	-0.1497	0.048	**	-0.0956	0.0454	*
Popularity	0.0191	0.006	**	0.0122	0.0058	*	0.0248	0.0061	**
<u>Social Selection</u>									
Friends Time0	0.2421	0.1187	*	0.2206	0.1091	*	0.3224	0.1172	**
Gender	-0.1298	0.1427		0.0091	0.1363		-0.3248	0.1515	*
GPA	-0.0373	0.1907		-0.0065	0.1859		-0.0913	0.1962	
Empathy	-0.0001	0.0032		-0.0014	0.0032		-0.0098	0.0037	**
Self-monitoring	-0.0134	0.0149		-0.0041	0.0149		0.0241	0.0166	†
Group	0.0424	0.0997		0.0081	0.0903		0.0125	0.1033	
Self-View Leader	0.0406	0.0999		0.1611	0.075	*	0.1747	0.0767	*
<u>Social Influence</u>									
Beh. Self-View linear shape	-0.2208	0.2046		-0.5432	0.3172	†	0.3313	0.2402	†
Beh. Self-View quadratic shape	-0.2831	0.0922	**	-0.3445	0.1402	**	-0.1814	0.0854	*
Beh. Self-View Indegree	0.075	0.0396	†	0.0793	0.0378	*	0.0812	0.0366	*

\*\* p<0.01; \* p<0.05; † p<0.1

**Table 8** - Emergence Travel Leader, Time Heterogeneity

The “Self-View Leader” and “Behavior Self-View Indegree” coefficients increased over time, both in absolute value and significance. These results suggest that a reciprocal relationship exists between self-view of leadership and leadership emergence, as the effects mutually reinforce each other and become stronger over time. This supports H3.

## DISCUSSION

In this paper, we used a longitudinal approach to investigate the role taking and peer perceptual processes that determine leadership emergence. We found that people who perceived themselves as leaders were more likely to receive leadership nominations over time (supporting H1), and individuals receiving more leadership nominations over time were more likely to see themselves as leaders (supporting H2). We also found these processes to reinforce each other: the impact of leadership self-view on leadership emergence and the impact of leadership emergence on leadership self-view became stronger over time (supporting H3).

These results have applied implications for practitioners and human resources consultants. First, our finding that self-view as a leader impacts the leadership emergence of young adults suggests that leadership trainings needs to go further than teaching effective behaviors to novice leaders (Dvir, Eden, Avolio, & Shamir, 2002). Time should also be dedicated to strengthening trainees’ self-views as a leaders. As noted by Lord and Hall (2005), developing leadership skills requires proactive behaviors which are facilitated “by seeing oneself as a potential leader and adopting a provisional identity” (p.596). Individuals with solidified leadership identities will act in accordance with their self-concept and exhibit observable leadership behaviors. Second, our finding that leadership nominations from peers impact one’s self-view as a leader highlights the importance of feedback in shaping leadership identity. While positive feedback (i.e., a greater number of

leadership nominations) reinforces and solidifies one's self-view as a leader, negative feedback may have the opposite effect (Lord & Hall, 2005). Social feedback is important in shaping one's self-view as a leader.

In this paper, we illustrated how leadership research can benefit from longitudinal analysis of leadership networks. Tracking leadership networks over time using actor oriented models accounts for (1) dynamic information about the pattern of leadership within groups (dynamic network effects), (2) individual characteristics and behavior influencing network dynamics, and (3) the network dynamics shaping behavior and social identity (Ibarra et al., 2005). Applying longitudinal actor oriented models to the analysis of leadership networks has the potential to open new investigations in leadership by addressing complex questions on the simultaneous role of leaders and followers' values, selves, and identities in leadership emergence.

#### *Limitations and Future Directions*

While the current study demonstrates reciprocal effects between self-view as a leader and leadership emergence, the process by which this occurs is still an open question. Future studies may address the role of mediators in this process. The process through which cues from peers translate into one's self-view as a leader, how individuals come to know that they have been identified as emergent leaders by the group, and how the individual internalizes this information to become part of their self-concept is also open for examination in the leadership literature. Finally, future efforts may investigate the boundary conditions of the processes examined in this paper. The reinforcing relationship between self-view as a leader and leadership emergence may operate unexpectedly under various situational and individual conditions. A finer understanding of the conditions under which this model operates effectively would have important real-world implications.

## CHAPTER 6 - EMERGENT LEADERS: EMOTIONALLY INTELLIGENT?

*Emotional intelligence is argued to play a significant role in leadership emergence. While recent research has focused on how empathetic skills influence emergence of leaders, the role of other emotional abilities remains unclear. The aim of this paper is to investigate how different emotional skills impact the emergence of task and relation leaders within a natural group. To conduct this research, a distributed leadership perspective will be adopted, therefore allowing the use social network analysis, and more particularly exponential random graph models, to examine the links between emotional abilities and leadership emergence.*

### INTRODUCTION

One implicit assumption in organizational research is that leaders play an important role in influencing group processes, norms, and performance by modeling teamwork and setting priorities (Bass, 1990; Kickul & Neuman, 2000; Mehra, Dixon, Brass, & Robertson, 2006). Emergent, or informal leaders, are not invested with formal authority, but are individuals who are perceived by others as leaders (Moss & Kent, 1996) and who influence other group members (Taggar, Hackett, & Saha, 1999). Emergent leaders gain their leadership role from the group's acceptance and recognition and have an influential power over the group, and also tend to complement official leaders and contribute strongly to the group processes and outcomes (Bass, 1990; Boyatzis, Goleman, & Rhee, 2000; Durham, Knight, & Locke, 1997; Wheelan & Johnston, 1996).

Recognizing the importance of informal leaders, scholars have explored individual characteristics likely to predict leader emergence (Judge, Bono, Llie, & Gerhardt, 2002), including

personal attributes (such as gender, self-monitoring, self-esteem), frequency of social interactions with other group members (Lord, 1977), and cognitive abilities such as the abilities to synthesize information and ideas (Boyatzis, 1982). While the role of traits and cognitive abilities has been investigated extensively, the role played by emotional abilities remains under-investigated (Kellet, Humphrey, & Sleeth, 2002, 2006; Wolff, Pescosolido & Druskat, 2002). This paucity of research is surprising because early work on emergent leaders suggested that informal leaders are skilled at taking in and understanding emotional information (Wolff et al., 2002).

According to Mayer, Salovey, and Caruso's ability model (2000), emotional intelligence encompasses four emotional abilities: (i) perceiving emotions in oneself and in others, (ii) using emotions to facilitate decision making, (iii) understanding the causes, consequences, and evolution of emotions, and (iv) managing emotion. Since different emotional abilities may have potentially different impacts on leadership emergence (George, 2000), the aim of this paper is to examine how, and to which extent, the different emotional abilities influence leadership emergence in a natural, leaderless, group.

This research makes three contributions. First, it goes beyond past studies to explore how emotional abilities impact the emergence of leaders when controlling for other key variables. While greater attention has been given on how the ability to perceive and express emotions (empathy) influences leadership emergence (Kellet et al. 2002, 2006; Wolff et al., 2002), the role played by other emotional abilities has been under-investigated. For example, Côté, Lopes, Salovey, and Miners (2009) were the first to emphasize the role of understanding emotions influence leadership emergence. Second, I distinguish the impact of emotional abilities on the emergence of task vs. relationship oriented leaders (Bales, 1950; Bales & Slater, 1955; Kellet et al., 2006; Taggar et al. 1999; Yukl, 1998). Task leaders are instrumental individuals, excelling at organising, planning, and

improving activities, who are directed toward assisting the group in achieving its goals while relation-oriented leaders play an important role in reinforcing and guiding the group behaviour, creating satisfying social interactions, and enhancing collaboration, conflict management, and solidarity among group members (Bales, 1950; Bales & Slater, 1955). Because task and relationship leaders differ in their influence over the group, emotional abilities may play a different role in their respective emergence. This is the first study to link emotional abilities to the emergence of two types of leaders. Third, I envision leadership as a *relationship* between those who aspire to lead and those who choose to follow (Cooper & Sawaf, 1997; Kouzes & Posner, 2004). By doing so, I can represent and analyze leadership using social network analysis and, more precisely, exponential random graph models. This methodology can provide another, but different, statistical assessment that leader emergence is linked to emotional abilities. As Balkundi and Kilduff (2005: 943) highlight: “a social network perspective (on leadership issues) does not eclipse the valuable results of conventional leadership research; rather, a network perspective can complement existing work without repeating it”.

This article is organized as follows. After providing the theoretical background on emotional intelligence and leadership emergence, I will describe four emotional skills and their potential role in leadership emergence. Then, I will present the research design and model used in this study. This particular section will include a description of the sample and data, a discussion on the empirical model specification, and explanations on the variables and measures used. The fourth section will report the results and conclusion.

## THEORETICAL BACKGROUND

Emergent leadership is a dynamic social process during which specific individuals adopt the role of a leader, although no formal authority is vested in the emerging leader (Durham et al., 1997; Moss & Kent, 1996; Schneider & Goktepe, 1983): emergent leaders gain their leadership role from the group's acceptance and recognition. "Existing theories and research reveal that informal leaders are selected because they display constructive task and team management behavior" (Wolff et al. 2002: 505). Restated, two predominant types of leaders, who fulfill different roles and missions, can emerge in teams: relationship-oriented vs. task-oriented leaders (Bales, 1950; Bales & Slater, 1955; Kellet et al., 2006; Taggar et al. 1999; Yukl, 1998). Relation-oriented leaders play an important role in reinforcing and guiding the group behaviour, creating satisfying social interactions, and enhancing collaboration, conflict management, and solidarity among group members. 'Relation behaviors include listening carefully to others, understanding their concerns, providing support and encouragement, helping, and recognizing people as individuals' (Kellet et al., 2006:150). On the other hand, task leaders are instrumental individuals, excelling at organizing, planning, and improving activities, who are directed toward assisting the group in achieving its goals (Bales, 1950; Bales and Slater, 1955). While prior work has identified several individual-level characteristics associated with emergent leadership such as gender, self-esteem, self-monitoring (Zaccaro, Foti & Kenny, 1991; Mehra, Kilduff & Brass, 2001), and cognitive skills, the role played by emotional abilities remains under-investigated.

Four emotional abilities compose the Mayer, Salovey and Caruso's construct of emotional intelligence (Caruso, Mayer, & Salovey; 2002; Mayer, Caruso & Salovey, 2000; Mayer, Caruso, Salovey, & Sitarenios, 2003; Mayer, Salovey, & Caruso, 2004; Mayer, Roberts, & Barsade, 2008): the

appraisal and expression of emotions (perceiving emotions), the use of emotions to enhance cognitive processes and decision making (using emotions), knowledge about emotions (understanding emotions), and management of emotions (managing emotions). While several models of emotional intelligence exist, this particular ability model experienced the most development and refinement, gained the greatest acceptance among researchers (Ashkanasy & Daus, 2005; Côté et al., 2009; Daus & Ashkanasy, 2005), and has good psychometric properties (Côté et al., 2009; Mayer et al., 2003, 2008).

**Perceiving Emotions** relates to the ability to identify and express emotions in oneself and others. It involves the capacities not only to communicate feelings accurately and to express related needs (Mayer & Salovey, 1997), but also to identify emotions through attention to language, sounds, gestures, appearances, and behavior (Mayer & Salovey, 1997). Appraisal and expression of emotions encompasses the concept of empathy, i.e. the ability to sense and understand someone else's feelings as if they were one's own.

By accurately identifying other group members' emotions and by communicating emotional information appropriately, emotionally intelligent individuals can influence the group social dynamics. They can do so by providing useful social support and maintaining positive relationships among members (George, 2000; Rogers, 1951). By enhancing the accuracy of their social perceptions, the ability to perceive emotions allows emotionally intelligent individuals to intervene within their group. As they are capable of guiding the group behavior and creating satisfying social interactions, people scoring high on the ability to perceive emotions are more likely to emerge as relationship-leaders (Kellet et al., 2002, 2006; Kickul & Neuman, 2000; Pielstick, 2000; Wolff et al., 2002).

Hypothesis 1a. *Individuals with a higher ability to perceive emotions are more likely to emerge as relation leaders.*

On the other hand, perceiving emotions can also influence team accomplishments by inspiring and arousing team members emotionally (George, 2000). Identifying emotional needs can help task-oriented leaders assist the group in achieving its goals. By expressing feelings of excitement, enthusiasm, and optimism, task-oriented leaders can motivate the group toward its objectives. Moreover, by establishing cooperation and positive relationships within the group, task-oriented leaders can enhance the group's efficiency and productivity. As the ability to perceive emotions can have a direct influence on the group tasks and activities, individuals scoring higher on this emotional ability will be more likely to emerge as task-oriented leaders (Kellet et al., 2002, 2006; Kickul & Neuman, 2000; Pielstick, 2000; Wolff et al., 2002).

Hypothesis 1b. *Individuals with a higher ability to perceive emotions are more likely to emerge as task leaders.*

**Using Emotions** entails the ability to make an adequate use of emotions in order to assist cognitive enterprises, such as reasoning, problem solving, and decision making (Mayer & Salovey, 1997). Using emotions can facilitate cognitive enterprises in several ways. First, it allows adopting multiple perspectives to assess a problem from all sides (Jordan, Ashkanasy, & Härtel, 2002), which enhances creativity, integrative thinking, attention to details, detection of errors and problems, careful information processing (Damasio, 1994; George, 2000; Ellis, Moore, Varner, & Ottaway, 1997). It allows people to explore broadened perspectives on issues, direct attention to urgent concerns (George & Brief, 1996), avoid rigidity effects, and to elicit responses from followers (Lewis, 2000). By processing information more deeply, individuals with a higher ability to use

emotions are likely to make helpful suggestions and contributions to the group task and, ultimately, to improve the performance of their group (Côté et al., 2009). As these individuals improve their group's reasoning, problem solving, and decision making, they are more likely to emerge as task-oriented leaders.

Hypothesis 2. *Individuals with a higher ability to use emotions to facilitate decision making are more likely to emerge as task leaders.*

**Managing Emotions** pertains to the ability to reduce, enhance, or modify an emotional response in oneself and others depending on a given situation (Eisenberg, Fabes, Guthrie, & Reiser, 2000). Managing emotions is an important ability for relation-leaders, whose primary roles are to guide the group behavior, create satisfying social interactions, and enhance collaboration, conflict management, and solidarity among group members (Bales, 1950; Bales & Slater, 1955; Kellet et al., 2006; Lopes, Salovey, & Strauss, 2003). As described by Pescosolido (2002:586): “leaders manage group emotional responses by first empathizing and identifying with the collective emotional state of group members, and understanding what factors in the situation are causing this emotional state. They then craft a response to the situation that is causing the emotional reaction, and communicate their response to the group both verbally and by taking action”. Therefore, individuals with a higher ability to manage emotions, by influencing the group's behavior, are more likely to be recognized as relation-oriented leaders by other group members.

Hypothesis 3a. *Individuals with a higher ability to manage emotions are more likely to emerge as relation leaders.*

Being able to modify an emotional response in oneself and others can impact cognitive enterprises in several ways. First, it allows successfully resolving conflicts (Fitness, 2000; Jordan &

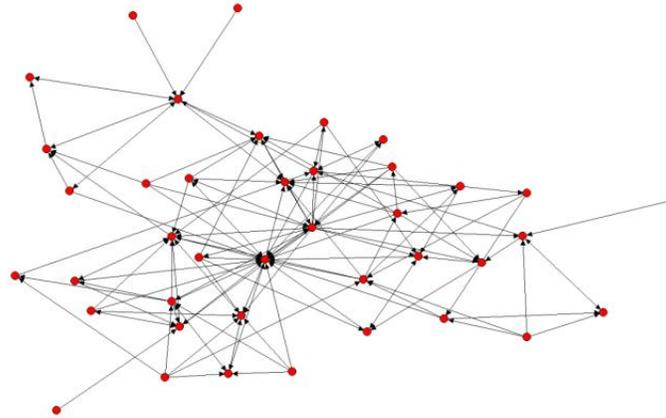
Troth, 2004) by reducing group member's feeling of anger, which potentially distract individuals from completing tasks (Jordan et al., 2002). Enhancing positive feelings can motivate others in achieving the group's objective. The previous can be attained by delaying gratification while working long hours on tasks, overcoming frustrations when encountering problems, maintaining confidence when facing unexpected problems, and generating a general marshal enthusiasm for completing their work tasks (Wolff, 2002). People who are capable of managing emotions in oneself and in others may therefore influence the group task. As they do, they are more likely to emerge as task-oriented leaders.

Hypothesis 3b. *Individuals with a higher ability to manage emotions are more likely to emerge as task leaders.*

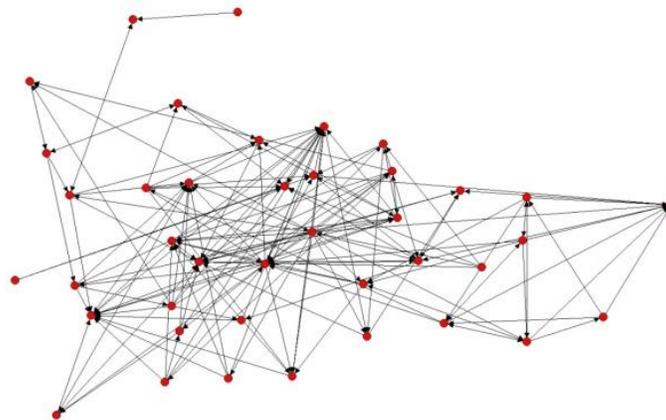
## RESEARCH DESIGN & MODEL

To identify emergent relation and task-oriented leaders (Yukl, 1998), participants for the 2008 study abroad group were asked, *at the end of the study abroad program*, who did they perceived as a leader when it came to achieve a group-project. Respondents were asked to distinguish between two types of leaders: task-oriented-leaders, who excel at organizing and planning group activities, and relationship-related-leaders, who are good at managing relationships across people working in the team. Respondents were free to nominate as many leaders as they deemed appropriate. To record their answers, respondents had to place a check by the names of each person they saw as a leader on a listing containing all participants' names. Answers were coded into two 40-by-40 binary adjacency matrices, one for each type of leadership style, where a 1 in cell (i,j) indicates that actor i says to perceive actor j as a leader, 0 otherwise. The relational contain of these matrices was then illustrated in a network to visualize how leadership was distributed among group members and to identify

emergent leaders, as demonstrated by Figures 4 and 5. Table 9 provides some descriptive network statistics.



**Figure 4** – Illustration - Relationship Leaders



**Figure 5** – Illustration - Task-Leaders

	Number of Ties	Network Centralization	Indegree Mean	Indegree Std Dev	Indegree Max
Relationship Leader	132	41.29%	3.3	2.619	16
Task Leader	171	28.21%	4.275	3.209	19

**Table 9** – Descriptive Network Statistics

### *Empirical Model Specification*

To connect the data that I collected to estimates of the theoretically relevant parameters, I applied Exponential Random Graphs Models (ERGM), also known as  $p^*$  (p-star) models (Snijders, Pattison, Robins, & Handcock, 2006).

### *Variables & Measures*

*Emotional Abilities.* Participants' emotional ability was assessed by completing the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT, Mayer et al. 2000, 2008). The MSCEIT is an ability-based test designed to measure the four branches of emotional intelligence: perceiving, using, understanding, and managing emotions. Throughout the test, respondents are asked to identify the emotions expressed by a face or in designs, to generate a mood and solve problems with that mood, to define the causes of different emotions, to understand the progression of emotions, and to determine how to best include emotion in our thinking in situations.

I chose to administer the MSCEIT for several reasons. First, according to Papadogiannis, Logan, and Sitarenios, (2009: 69), the “MSCEIT is a reliable and valid measure of emotional intelligence and lends support to the notion purported by McEnrue and Groves (2006) that the ability model of the MSCEIT makes it one of the more promising measures of EI in use today”. Indeed, recent developments increased its reliability (Mayer et al., 2003), discriminant validity with respect to personality traits and cognitive intelligence (Brackett & Salovey, 2003; Côté & Miners, 2006; Lopes, Nezlek, Schutz, Sellin, & Salovey, 2004), and criterion validity with criteria such as social functioning (Brackett & Salovey, 2006) and job performance (Côté & Miners, 2006). Second, the MSCEIT remains the most studied, developed, and used measure of emotional intelligence (Ashkanasy & Daus, 2005; Anthonakis, Ashkanasy, & Dasborough, 2009; Côté et al., 2009).

*Cognitive Abilities.* Following an ample body of work (Valacich, Jung, & Looney, 2006), I used Grade Point Average (GPA) as a proxy to assess students' cognitive abilities (Carroll, 1993; Wagner, 1995).

*Control Variables.* In the empirical model specification, I control for a number of key variables that may mediate the relationship between emotional abilities and leadership. I control for three broad classes of exogenous effects: individual attributes, dyadic covariates, and endogenous network effects. Three individual attributes, all of which may play a role in leadership emergence, were included in this analysis: group identification (GID), self-esteem, self-monitoring, and gender. Table 10 reports means and standard deviations on all individual covariates described above. It also shows the correlation matrix among the individual variables used in the analysis.

<b>Variables</b>	Mean	S.D.	1	2	3	4	5	6	7	8
1. Group Identification	32.11	4.90	---							
2. Self-Esteem	34.56	3.52	0.190	---						
3. Self-Monitoring	13.15	3.24	-0.003	-0.185	---					
4. Gender	0.925	0.27	-0.072	0.070	-0.1054	---				
5. GPA	3.43	0.26	-0.234	-0.175	-0.2998 *	-0.102	---			
6. Perceiving Emotions	100.45	12.52	-0.163	0.110	-0.2413	0.371 **	0.098	---		
7. Using Emotions	92.35	12.74	-0.326 **	0.097	0.1416	0.483 **	0.061	0.517***	---	
8. Understanding Emotions	98.63	8.00	-0.149	-0.074	0.2189	0.083	0.109	0.144	0.130	---
9. Managing Emotions	99.08	6.84	0.020	0.303 **	-0.0711	-0.011	-0.043	0.163	0.332**	0.021

\*p<.10; \*\*p<.05; \*\*\*p<.01

**Table 10 - Descriptive Statistics and Correlation Matrix**

One *dyadic relation* was included to control if leadership and friendship networks may be related: people may nominate friends as leaders. Finally, as required by p\* models, I also control for six *endogenous network effects*.

RESULTS

For each type of leadership network, a set of models was built using a step-wise approach. Model 1 includes endogenous network effects and the dyadic covariate, individual variables were inserted in Model 2, and, finally, emotional abilities were included in Model 3, 4, and 5 respectively (Tables 11 and 12). In both cases, model convergence was reached, therefore allowing the interpretation of estimates and standard errors.

	<i>Relationship Leader</i>				
	Model 1	Model 2	Model 3	Model 4	Model 5
Arc	-3.026 ** (0.209)	-3.947 * (1.788)	-2.082* (1.319)	-3.132 ** (0.313)	-3.109 ** (0.307)
In-2-Star	0.072 ** (0.020)	0.056 ** (0.022)	0.043 ** (0.021)	0.049 ** (0.023)	0.062 ** (0.021)
Out-2-Star	-0.038 † (0.021)	-0.009 (0.027)	- 0.022 (0.030)	-0.036 (0.029)	-0.034 (0.027)
AKT-T(2.00)	0.674 ** (0.136)	0.645 ** (0.143)	0.809 ** (0.151)	0.736 ** (0.143)	0.656 ** (0.139)
A2P-T(2.00)	-0.096 ** (0.037)	-0.097 * (0.042)	-0.097 ** (0.039)	-0.103 ** (0.041)	-0.088 ** (0.037)
Initial Friendship	0.544 * (0.255)	0.508 * (0.276)	0.652 ** (0.239)	0.433 ** (0.225)	0.580 ** (0.228)
Gender		0.158 (0.170)	0.174 † (0.140)	0.180 (0.225)	0.107 (0.222)
GID		0.009 (0.014)	0.011 (0.017)	0.015 (0.016)	0.012 (0.014)
Self Esteem		-0.017 (0.019)	-0.022 (0.020)	-0.017 (0.019)	-0.031 † (0.020)
Self Monitoring		0.075 ** (0.030)	0.116 ** (0.024)	0.126 ** (0.019)	0.118 ** (0.027)
GPA		0.192 (0.320)	0.236 (0.178)	0.019 (0.151)	-0.117 (0.165)
Perceiving Emotions			0.019 * (0.009)		
Using Emotions				-0.001 (0.007)	
Managing Emotions					0.024 * (0.012)

\*\* p<0.01, \* p<0.05, † p<0.1

**Table 11** - p\* models for the emergence of relationship-oriented leaders

	<i>Task Leader</i>				
	Model 1	Model 2	Model 3	Model 4	Model 5
Arc	-2.310 ** (0.224)	-3.223 ** (1.259)	-2.788 † (1.759)	-1.716 ** (0.269)	-1.760 ** (0.267)
In-2-Star	0.017 (0.017)	0.021 (0.016)	0.007 (0.017)	0.011 (0.018)	0.011 (0.017)
Out-2-Star	-0.019 † (0.016)	-0.023 (0.017)	0.002 (0.020)	0.005 (0.021)	0.009 (0.020)
AKT-T(2.00)	0.845 ** (0.103)	0.834 ** (0.105)	0.805 ** (0.106)	0.823 ** (0.102)	0.866 ** (0.103)
A2P-T(2.00)	-0.226 ** (0.035)	-0.224 ** (0.035)	-0.207 ** (0.035)	-0.216 ** (0.033)	-0.231 ** (0.035)
Initial Friendship	0.466 ** (0.202)	0.529 ** (0.207)	0.441 * (0.201)	0.451 * (0.225)	0.433 * (0.222)
Gender		0.097 (0.162)	0.034 (0.343)	0.208 (0.190)	0.152 (0.176)
GID		0.012 (0.011)	0.024 † (0.014)	0.006 (0.017)	0.003 (0.016)
Self Esteem		0.002 (0.015)	0.017 (0.019)	0.006 (0.023)	0.005 (0.022)
Self Monitoring		-0.003 (0.018)	0.020 (0.027)	0.015 (0.024)	0.017 (0.024)
GPA		0.321 * (0.224)	0.620 ** (0.223)	0.489 * (0.222)	0.425 * (0.225)
Perceiving Emotions			0.014 * (0.007)		
Using Emotions				0.006 (0.008)	
Managing Emotions					0.018 † (0.011)

\*\* p<0.01, \* p<0.05, † p<0.1

**Table 12** - p\* models for the emergence of task-oriented leaders

Control variables reveal interesting group's dynamics. Whereas no support was found concerning the influence of self-esteem on leadership emergence, high self-monitors were more likely to emerge as relation-leaders than low self-monitors (Zaccaro et al., 1991) and, as it could be expected, individuals with higher GPA were more likely to emerge as task-leaders.

Results reveal that people with higher abilities to perceive and to manage emotions were more likely to be perceived as relation leaders ( $\beta_{PerceivingEmo}(RoL)=0.019$ ,  $p<0.05$ ;

$\beta_{ManagingEmo}(RoL)=0.024, p<0.05$ ), therefore supporting *Hypotheses 1.a and 3.a*. The previous corroborates the claim that the ability to identify and express emotions in oneself and others, i.e. empathetic skill, as well as the ability to manage emotions are important to leadership emergence (Kellet et al., 2002, 2006; Pescosolido, 2002). On the other hand, people with higher abilities to use emotions to facilitate decision making did not emerge as relationship leaders. This result can be explain by the fact that relation-oriented leaders' primary role is not to assist group reasoning, problem solving, and decision making.

Concerning the emergence of task-oriented leaders, results suggest that people with higher abilities to perceive emotions were more likely to be nominated as task-oriented leaders (support *H1.b*) ( $\beta_{PerceivingEmo}(ToL)=0.014, p<0.05$ ). The coefficient associated with the ability to manage emotions is significant at a 10% level only ( $\beta_{ManagingEmo}(ToL)= 0.018, p<0.1$ ). No support was found concerning the role of using emotions (*H2*). On the other hand, results suggest that cognitive capacities, reflected in students' GPA, were the main factor influencing task-leadership emergence.

## DISCUSSION

People differ in their emotional abilities. This heterogeneity may be a factor favoring the emergence of emotionally intelligent individuals as leaders for their group. In this paper, I investigated how, and to which extend, the different components of emotional intelligence are related to leadership emergence. Using ERGM, several personality-trait results were related to leader emergence (i.e., self monitoring) but also emotional abilities. Results revealed that individuals with stronger abilities to perceive emotions were more likely to emerge as relation and task-oriented leaders. As the ability to perceive emotions encompasses empathetic skills, these results are consistent with previous work which linked empathy and leadership emergence (Wolff et al., 2002;

Kellet et al., 2002, 2006). On the other hand, when controlling for cognitive abilities, results suggest that people with stronger ability to manage emotions were more likely to emerge as relation-leaders and, to a smaller extent, task-oriented leaders. These results are consistent with past studies which argue that emergent leaders are managers of group emotions (Pescosolido, 2002). Overall, these results are important because they represent additional evidence that emotional intelligence plays a role in leader emergence. They also highlight that not all emotional abilities have the same influence on leadership emergence. While all emotional abilities were hypothesized to favor emergence of leaders, analysis revealed that, in the context of this study, the ability to use emotions to facilitate decision making did not influence leader emergence.

By representing leadership as a network, I used exponential random graph models which allowed me to explore if individuals with certain characteristics were more likely to receive leadership nominations, i.e. to be perceived as leaders by the rest of the group (leader-perspective on leadership). By adopting such methodology, I illustrate how a “network perspective can complement existing work without repeating it” (Balkundi & Kilduff, 2005: 943). These models provide another, but different, evidence that emergence of leaders is linked to personality traits and emotional abilities.

#### *Limitations & Future Research*

This research contains several acknowledge limitations which need to be taken into consideration. First, this study examined direct effects of emotional abilities on leadership emergence. To better understand the role of emotional abilities, future research needs to focus on the mechanisms linking emotional abilities to task and relational leadership emergence. Detecting these mechanisms can enhance our comprehension of why dimensions of emotional intelligence

lead group members to cede informal authority and responsibility for decisions about relationship and task issues to individuals who previously did not possess such authority and responsibility. Second, while this paper focused on characteristics of the designated leaders (only receiver-effects were included in the models), the following step will be to make full use of ERGM and adopt a follower-centered approach by including sender-effects. As noted by George (2000) “the study of emotional intelligence and leadership would benefit from the consideration of emotional intelligence in followers and its effects on the leadership process”. Therefore, contributions and refinements to leadership theories can be made by adopting follower-centered approaches.

## CHAPTER 7 – DISCUSSION & CONCLUSION

The study of emergent leadership within groups has not received similar levels of attention or analysis within the literature when compared to other models of leadership (Kickul & Neuman, 2000). Leadership emergence remains an intriguing social process. The complexity surrounding leadership emergence pushes scholars to continue asking questions about the individual, group, and contextual factors driving emergent leadership and, in order to better capture and unfold the phenomenon, to overcome acknowledged methodological limitations of past studies, such as the failure to express and analyze leadership as a dynamic social process (Kickul & Neuman, 2000; Judge, Bono, Ilies & Gerhardt, 2002), the choice of cross-sectional designs (Mahar & Mahar, 2004), and studies conducted in laboratory settings lasting for only a few minutes (Moss & Kent, 1996).

A key contribution of this dissertation is to use advanced social network techniques to conduct emergent leadership research. By asking group members who they perceive as a leader, I “mapped” these perceptions into a network where nodes and arrows represent individuals and leadership nominations respectively. This particular representation illustrates how leadership is distributed among group members (Gronn, 2002; Pearce, Conger, & Locke, 2007; Mehra, Smith, Dixon, & Robertson, 2006). When repeated over time, this procedure captures dynamic leadership networks. Dynamic leadership networks (i) envision leadership as a complex, interactive, and multi-person process, (ii) do not force the emergence of a single-leader (multiple leaders can emerge - ultimately, every group member can be designated as a leader), (iii) capture the real dynamics occurring in a particular group, (iv) preserve “information about the actual pattern of leadership distribution within teams” (Mehra et al., 2006: 233), and (v) track the evolution of distributed leadership. I conducted actor-oriented models of network evolution (Snijders, 2004; 2005) to

explore how leadership network evolve over time. By doing so, this dissertation reveals an unexplored and promising synergy between social network analysis and leadership theories (Balkundi & Kilduff, 2005). Using this innovative research strategy, this thesis aims at refining our understanding of the process of leadership emergence by exploring through three manuscripts how relational schemas, self-perceptions, and emotional abilities influence the emergence of leadership in a natural group.

As the process of leadership emergence entails complex dynamics of “social construction” whereby a group’s members progressively converge towards a collective definition of a leadership hierarchy (Mehra, Smith, Dixon, & Robertson, 2006), the first manuscript is dedicated to study the process of social construction through which specific individuals get to be perceived as leaders by the group (Day, Gronn, & Salas 2004, 2006; Morgeson, DeRue, & Karam, 2009). Focusing on emergent patterns formed by leadership ties, this investigation reveals that leadership networks are affected by the tendencies toward transitivity, non-cycles, and reinforcing popularity. These findings suggest that group members’ leadership perceptions, although “a micro-level, psychological process that involves a single individual's perception of a potential leader” (Fonti, Knee, & Backert, 2008: 179), are interdependent and affect the progress of emergent leadership. In other words, leadership perceptions among group members are *socially constructed*. People, when nominating a leader, do not search for great men only: who other group members do (or do not) perceive as a leader may be a source of information which can influence one individual’s leadership perception and, ultimately, affect the group process of emergent leadership.

The second manuscript investigates how leadership networks and social identity (self-view as a leader) co-evolve over time. By explicitly modeling the co-evolution of self-view as a leader and leadership networks, this research answers Ibarra, Kilduff, and Tsai’s (2005) call for research on how

social identity affects networks and how networks shape social identity. Until recently, such investigation was not possible as we did not have the adequate instruments to analyze such co-evolution. As the first study to model the reciprocal effects of self-view as a leader and leadership emergence, this research provides empirical support for a relationship both practitioners and scholars often assume in leadership – that self-view as a leader helps an individual become a leader (people who perceived themselves as leaders were more likely to receive leadership nominations). We also find support that leadership emergence reinforces self-view as a leader over time: as one emerges as a leader (i.e., receives an increasing number of leadership nominations), one's self-view as a leader increases. Result also revealed that individual's self-view as a leader and an individual's leadership emergence reinforce each other: both of these effects become stronger over time.

Finally, the last manuscript brings a further piece of evidence to the ongoing debate on the role of emotional intelligence in leadership emergence (Antonakis, 2004; Ashkanasy & Daus, 2005). Interestingly, while greater attention has been given on how the ability to perceive and express emotions (empathy) influences leadership emergence (Kellet et al. 2002, 2006; Wolff et al., 2002), the role played by other emotional abilities has been under-investigated. In this paper, I therefore examine how all emotional abilities impact the emergence of leaders. Results obtained using exponential random graph models on two leadership networks (task vs. relationship leaders - task leaders are instrumental individuals, excelling at organizing, planning, and improving activities, who are directed toward assisting the group in achieving its goals while relation-oriented leaders play an important role in reinforcing and guiding the group behavior, creating satisfying social interactions, and enhancing collaboration, conflict management, and solidarity among group members) suggest that individuals with stronger abilities to perceive and manage emotions were more likely to emerge

as relation and task-oriented leaders, while the abilities to use emotions to facilitate decision making did not influence leadership emergence.

## LIMITATIONS

While each theoretical chapter discusses its own limits, this thesis contains several general limitations which need to be acknowledged. First, the generalization of the results obtained is limited due to the social context and characteristics of the sample. Respondents were students involved in a study-abroad program which required participants to live together in dorm-like accommodations, attend classes at a local university, work on assignments and field projects, and travel extensively throughout Europe. This particular social context does not entirely represent the challenges and social structures of real-work in organizations. In organizations, emergent leaders are constrained by formal hierarchies, administrative procedures, and performance objectives. Research would benefit from similar studies performed in an organizational context. Moreover, no restrictions or manipulations were imposed on the group's composition. An unintended consequence of this demarche was that the sample contained a high proportion of women. Even if gender was statistically controlled for in the models, it is possible to results may have been influenced by the group composition.

Participants were not given a clear definition of the term "leaders" or instructions on how to classify a person as a leader. So, who people see as a leader varies as a function of how they define or otherwise conceptualize what it means to be a leader. Although this operationalization is consistent with the theoretical conception of leadership as a phenomenological construct (Calder, 1977; Meindl, 1993), not providing a definition of the term "leader" may be seen as a limitation with a sample of undergraduate students as research has shown that what it means to be a leader varies

among college students and can develop in dramatic ways over the course of the college experience (Komives, Owen, Longersbeam, Mainella, & Osteen, 2005). To strengthen the findings reported in this dissertation, it would be interesting to examine leadership emergence using other measures of leadership such as peer-ratings, the Conger-Kanungo leadership scale (Conger & Kanungo, 1994; Conger, Kanungo, & Menon, 2000), or by following the same procedure, i.e., asking people “Who did you perceive as a leader?”, complemented with a clear definition of leadership such as “leadership is the process of influencing others to understand and agree about what needs to be done and how to do it, and the process of facilitating individual and collective efforts to accomplish shared objectives” (Yukl, 2010).

#### FUTURE RESEARCH

This dissertation brings for the first time together actor oriented network models and leadership. Future research is clearly needed to extend the ideas and models developed in this dissertation.

The study of emergent leadership would benefit from the consideration of followers, leaders, and their similarities (or dissimilarities) and their respective effects on the emergent leadership process. By combining simultaneously leader and follower-centered approaches, future studies can make full use of models for longitudinal leadership networks. Indeed, while this thesis primarily focused on characteristics of the designated leaders (i.e., only receiver-effects were included in the models capturing if people scoring high on a particular covariate were more likely to receive greater number of leadership nominations over time), the following step should include sender-effects which capture the tendency for people scoring high on a particular covariate to send greater number of leadership nominations over time. Finally, these studies should take into account the fit, or

correspondence, between group member traits and leader traits (i.e., the effect of trait similarities/differences on leadership emergence – a “similarity effect”).

## CONCLUSION

Synergies between leadership research and social network approaches (Balkundi & Kilduff, 2005) open new and fascinating investigations. In this dissertation, I illustrate how longitudinal analysis of leadership networks provide a more realistic and complex perspective on leadership emergence. These models have the potential to refine current theories by explicitly taking into account the complexity surrounding leadership and analyzing it. I believe that the research described here takes a first step at developing a new approach to understand how distributed leadership emerges in groups.

## REFERENCES

- Amit, K., Popper, M., Gal, R., Mamane-Levy, T., & Lisak, A. (2009). Leadership-shaping experiences: a comparative study of leaders and non-leaders. *Leadership & Organization Development Journal*, 30(4), 302-318.
- Andrews, P.H. (1984) Performance, self-esteem and perception of leadership emergence: A comparative study of men and women. *Western Journal of Speech Communication*, 48(1), 1-13.
- Antonakis J. (2004). On why "emotional intelligence" will not predict leadership effectiveness beyond IQ or the "big five": An extension and rejoinder. *Organizational Analysis*, 12(2), 171-182.
- Antonakis, J., Ashkanasy, N.M., & Dasborough, M.T. (2009). Does leadership need emotional intelligence. *Leadership Quarterly*, 20, 247-261.
- Arnoff, J., & Wilson, J.P. (1985). *Personality in the social process*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Ashford, S. J., Blatt, R., & Vandewell, D. (2003). Reflections on the looking glass: A review of research on feedback-seeking behavior in organizations. *Journal of Management*, 29(6), 773-799.
- Ashkanasy, N.M., & Daus, C.S. (2005). Rumors of the death of emotional intelligence in organizational behaviour are vastly exaggerated. *Journal of Organizational Behavior*, 26, 441-452.
- Astley, W.G., & Sachdeva, P.S. (1984). Structural Sources of Intraorganizational Power: A Theoretical Synthesis. *Academy of Management Review*, 9(1), 104-113.

- Avolio, B.J., Walumbwa, F.O., & Weber, T.J. (2009). Leadership: Current theories, research, and future directions. *Annual Review of Psychology*, 60, 421-449.
- Back, M.D., Schmukle, S.C., & Egloff, B. (2009). Predicting actual behavior from the explicit and implicit self-concept of personality, *Journal of Personality and Social Psychology*, 97(3), 533-548.
- Bales, R.F. (1950). *Interaction process analysis: a method for the study of small groups*. Chicago: University of Chicago Press.
- Bales, R.F., & Slater, P.E. (1955). Role differentiation in small decision-making groups. In T. Parsons, & P.E. Slater (Eds.), *The family, socialization and interaction processes* (pp.259–306). Glencoe, IL: Free Press.
- Balkundi, P. (2004). *Ties and teams: A social network approach to team leadership*. PhD thesis, Pennsylvania State University, USA.
- Balkundi, P., & Harrison, D.A. (2006). Ties, leaders, and time in teams: Strong inference about network structure's effects on team viability and performance. *Academy of Management Journal*, 49(1), 49-68.
- Balkundi, P., & Kilduff, M. (2005). The ties that lead: A social network approach to leadership. *Leadership Quarterly*, 16, 941-961.
- Baron, R.A. (1989). Personality and organizational conflict : effects of the type A of behavior pattern and self-monitoring. *Organizational Behavior and Human Decision Processes*, 33, 196-281.
- Bass, B.M. (1989). *Leadership and interpersonal behaviour*. New York: Holt, Rinehart and Winston.

- Bass, B.M. (1990). *Bass and Stogdill's handbook of leadership: theory, research, and managerial applications* (3<sup>rd</sup> Ed.). New York: Free Press.
- Bass, B.M., & Barrett, G.V. (1981). *People, work, and organizations* (2<sup>nd</sup> Ed.). Boston: Allyn & Bacon.
- Bluedorn, A.C., & Jaussi, K.S. (2008). Leaders, followers, and time. *Leadership Quarterly*, 19, 654-668.
- Borgatti, S.P., & Foster, P.C. (2003). The network paradigm in organizational research: A review and typology. *Journal of Management*, 29(6), 991-1013.
- Boyatzis, R.E. (1982). *The competent manager: a model for effective performance*. New York: Wiley-Interscience.
- Boyatzis, R.E., Goleman, D., & Rhee, K.S. (2000). Clustering competence in emotional intelligence: insights from the Emotional Competence Inventory. In R. Bar-On, & J.D.A. Parker (Eds.), *The handbook of emotional intelligence: theory development, assessment, and application at home, school and in the workplace* (pp. 343-361). San Francisco: Jossey Bass.
- Brackett, M., & Salovey, P. (2004). Measuring emotional intelligence with the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT). In G.Geher (ed.), *Measuring emotional intelligence: common ground and controversy* (pp. 179-194). Hauppauge, New York: Nova Science Publishers.
- Bugental, D. & Lehner, G. (1958). Accuracy of self-perception and group-perception as related to two leadership roles. *The Journal of Abnormal and Social Psychology*, 56(3), 396-398.
- Burt, R.S. (1999). Entrepreneurs, distrust, and third parties: A strategic look at the dark side of dense networks. In L. L. Thompson, J. M. Levine & D. M. Messick (Eds.): *Shared Cognition in Organizations: The Management of Knowledge* (pp. 213-43). Mahwah: Erlbaum.

- Burt, R.S. (2000). The network structure of social capital. In B. M. Staw & R. I. Sutton (Eds.): *Research in Organizational Behavior* (pp. 345-423). New York: Elsevier Science.
- Burt, R.S. (2001). Structural holes versus network closure as social capital. In N. Lin, K. Cook and R.S. Burt (Eds.): *Social Capital: Theory and Research. Sociology and Economics: Controversy and Integration series* (pp. 31-56). New York: Aldine de Gruyter.
- Byrne, B. M. (1996). Academic self-concept: Its structure, measurement, and relation to academic achievement. In B. A. Bracken (Ed.), *Handbook of self-concept* (pp. 287–316). New York: Wiley.
- Calder, B.J. (1977). An attribution theory of leadership. In B. M. Staw, & G. R. Salancik (Eds.), *New directions in organizational behavior* (pp. 179–204). Chicago, IL: St. Clair.
- Carli, L.L., & Eagly, A.H. (1999). Gender effects on social influence and emergent leadership. In G.N. Powell (Ed.), *Handbook of gender and work* (pp. 203-222). Thousand Oaks, CA: Sage Publications.
- Carroll, J.B. (1993). *Human cognitive abilities: a survey of factor-analytic studies*. New York: Cambridge University Press.
- Carson, J.B., Tesluk, P.E., & Marrone, J.A. (2007). Shared leadership in teams: an investigation of antecedent conditions and performance. *Academy of Management Journal*, 50(5), 1217-1234.
- Caruso, D.R., Mayer, J.D., & Salovey, P. (2002). Emotional intelligence and emotional leadership. In R. E. Riggio, S. E. Murphy, & F. J. Pirozzolo (Eds.), *Multiple intelligences and leadership* (pp. 55-74). Mahwah, NJ: Lawrence Erlbaum Associates.

- Carter, L., Haythorn, W., Shriver, B., & Lanzetta, J. (1951). The behavior of leaders and other group members. *Journal of Abnormal and Social Psychology*, 46, 589–595.
- Chen, G., Kirkman, B.L., Kanfer, R., Allen, D., & Rosen, B. (2007). A multilevel study of leadership, empowerment, and performance in teams. *Journal of Applied Psychology*, 92(2), 331-346.
- Cooley, C. H. (1902). *Human nature and the social order*. New York: Scribners.
- Cooper, R.K, & Sawaf, A. (1997). *Executive EQ: Emotional Intelligence in Leadership and Organisations*. New York, NY: Grosset/Putnum.
- Côté, S., & Miners, C.T.H. (2006). Emotional intelligence, cognitive intelligence, and job performance. *Administrative Science Quarterly*, 51, 1-28.
- Côté, S., Lopes, P.N., Salovey, P., & Miners, C.T.H. (2009). Emotional intelligence and leadership emergence in small groups. *Leadership Quarterly*. Forthcoming.
- Damasio, A.R. (1994). *Descartes' error*. New York: G.P. Putman's Sons.
- Daus, C.S., & Ashkanasy, N.M. (2005). The case for the ability-based model of emotional intelligence in organizational behavior. *Journal of Organizational Behavior*, 26, 453-466.
- Day, D.V., Gronn, P., & Salas, E. (2004). Leadership capacity in teams. *Leadership Quarterly*, 15, 857-880.
- Day, D.V., Gronn, P., & Salas, E. (2006). Leadership in team-based organizations: On the threshold of a new era. *Leadership Quarterly*, 17, 211-216.
- Day, D.V., & Harrison, M.M. (2007). A multilevel, identity-based approach to leadership development. *Human Resource Management Review*, 17, 360–373.

- De Soto, C.B., & Kuethe, J.L. (1959). Subjective probabilities of interpersonal relationships. *Journal of Abnormal and Social Psychology*, 59, 200-204.
- De Souza, G. & Klein, H.J. (1995). Emergent leadership in the group goal-setting process. *Small Group Research*, 26, 475-496.
- Durham, C.C., Knight, D., & Locke, E.A. (1997). Effects of leader role, team-set goal difficulty, efficacy, and tactics on team effectiveness. *Organizational Behavior and Human Decision Processes*, 72, 203-231.
- Dvir, T., Eden, D., Avolio, B. J., & Shamir, B. (2002). Impact of transformational leadership on follower development and performance: A field experiment. *Academy of Management Journal*, 45(4), 735-744.
- Ellis, H.C., Moore, B.A., Varner, L.J., & Ottaway, S.A. (1997). Depressed mood, task organization, cognitive interference, and memory: Irrelevant thoughts predict recall performance. *Journal of Social Behavior and Personality*, 12, 453-470.
- Eisenberg, N., Fabes, R. A., Guthrie, I. K., & Reiser, M. (2000). Dispositional emotionality and regulation: their role in predicting quality of social functioning. *Journal of Personality and Social Psychology*, 78, 136–157.
- Emirbayer, M., & Goodwin, J. (1995). Network analysis, culture, and the problem of agency. *American Journal of Sociology*, 99(6), 1411-1454.
- Ensley, M.D., Hmieleski, K.M., & Pearce, C.L. (2006). The importance of vertical and shared leadership within new venture top management teams: Implications for the performance of startups. *Leadership Quarterly*, 17, 217–231.

- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.
- Fiske, A.P. (1991). *Structures of social life: The four elementary forms of human relations*. New York: Free Press.
- Fiske, A.P. (1992). The four elementary forms of sociality: Framework for a unified theory of social relations. *Psychological Review*, 99, 689-723.
- Fiske, A.P., & Tetlock, P.E. (1997). Taboo Trade-Offs: Reactions to Transactions That Transgress the Spheres of Justice. *Political Psychology*, 18(2), 255-297.
- Fitness, J. (2000). Anger in the workplace: An emotion script approach to anger episodes between workers and their superiors, co-workers and subordinates. *Journal of Organizational Behavior*, 21, 147-162.
- French, D.C., Waas, G.A., Stright, A.L., & Baker, J.A. (1986). Leadership asymmetries in mixed-age children's groups. *Children Development*, 57, 1277-1283.
- Foti, R.J., Knee, R.E., & Backert, R.S.G. (2008). Multi-level implications of framing leadership perceptions as a dynamic process. *Leadership Quarterly*, 19, 178-194.
- Furham, A., & Capon, M. (1983). Social skills and self-monitoring processes. *Personality and Individual Differences*, 3, 311-320.
- Gamble, W. C., & Yu, J. J. (2008). Adolescent Siblings' Looking Glass Self-Orientations: Patterns of Liabilities and Associations with Parenting. *Journal of Youth and Adolescence*, 37(7), 860-874.

- George, J.M. (2000). Emotions and leadership: the role of emotional intelligence. *Human Relations*, 53(8), 1027-1055.
- George, J.M., & Brief, A.P. (1996). Motivational agendas in the workplace: the effects of feelings on focus of attention and work motivation. In B.M. Staw and L.L. Cummings (Eds), *Research in organizational behavior* (pp. 75-109). Greenwich, CT: JAI Press.
- Goodreau, S.M. (2007). Advances in exponential random graph (p\*) models applied to a large social network. *Social Networks*, 29(2), 231-248.
- Goodwin, R. (1999). *Personal relationships across cultures*. London: Routledge.
- Goffman, E. (1959). *The presentation of self in everyday life*. Garden City, NY: Doubleday.
- Graen, G.B. (2006). In the eye of the beholder: cross-cultural lesson in leadership from project GLOBE: a response viewed from the third culture bonding (TCB) model of cross-cultural leadership. *Academy of Management Perspectives*, 20, 95–101.
- Graen, G.B., & Graen (2006). *Sharing network leadership* (Vol. 4). Greenwich, CT: Information Age Publishing.
- Graen G.B, & Uhl-Bien M. (1995). Relationship-based approach to leadership - development of leader-member exchange (LMX) theory of leadership over 25 year - applying a multilevel multidomain perspective. *Leadership Quarterly*, 6, 219–47.
- Gronn, P. (2002). Distributed leadership as unit of analysis. *Leadership Quarterly*, 13, 423-451.
- Grubb, E. L., & Grathwohl, H. L. (1967). Consumer self-concept, symbolism and market behavior: A theoretical approach. *Journal of Marketing*, 31(4), 22-27.

- Guastello, S.J. (2007). Non-linear dynamics and leadership emergence. *Leadership Quarterly*, 18(4), 357-369.
- Hamblin, R.L. (1958). Leadership and crises. *Sociometry*, 21, 322–335.
- Handcock, M.S. (2003). Statistical models for social networks: degeneracy and inference. In: Breiger, R., Carley, K., & Pattison, P. (Eds.). *Dynamic Social Network Modeling and Analysis* (pp. 229–240). Washington, DC: National Academies Press.
- Hanges, P.J., Dorfman, P.W., Shteynberg, G., & Bates, A.L. (2006). Culture and leadership: A connectionist information processing model. In W.H. Mobley and E. Weldon (Eds.), *Advances in Global Leadership* (pp. 7-37). Amsterdam, NE: Elsevier.
- Haslam, N., & Fiske, A.P. (1999). Relational models theory: A confirmatory factor analysis. *Personal Relationships*, 6, 241-250.
- Hersey, P., & Blanchard, K.H. (1977). *Management of organizational behavior – Utilizing human resources* (3<sup>rd</sup> Edition). New Jersey: Prentice Hall.
- Hemphill, J.K. (1949): *Situational Factors in Leadership*. Columbus, Ohio: Ohio State University Press.
- Hill, N.C., & Ritchie, J.B. (1977). The effect of self-esteem on leadership and achievement: A paradigm and a review. *Group and Organization Management*, 2(4), 491-503.
- Hogan, R., & Kaiser, R.B. (2005). What we know about leadership. *Review of General Psychology*, 9(2), 169-180.
- Hogg, M.A. (2001a). A Social Identity Theory of Leadership. *Personality and Social Psychology Review*, 5(3), 184-200.

- Hogg, M.A. (2001b). From prototypicality to power: A social identity analysis of leadership. In S.R. Thye, E.J. Lawler, M.W. Macy & H.A. Walker (Eds.), *Advances in Group Processes* (pp. 1–30). Oxford, UK: Elsevier.
- Hogg, M.A. (2003). Social identity. In M.R. Leary & J.P. Tangney (Eds.), *Handbook of Self and Identity* (pp. 462–479). New York: Guilford.
- Hogg, M.A., & Hains, S.C. (1996). Intergroup relations and group solidarity: Effects of group identification and social beliefs on depersonalized attraction. *Journal of Personality and Social Psychology*, 70, 295-309.
- Hogg, M.A., & Terry, D. J. (2000). Social identity and self-categorization processes in organizational contexts. *Academy of Management Review*, 25, 121–140.
- Hogue, M., & Lord, R.G., (2007) A multilevel, complexity theory approach to understanding gender bias in leadership. *Leadership Quarterly*, 18, 370-390.
- Holland, P. W., & Leinhardt, S. (1971). Transitivity in structural models of small groups. *Comparative Group Studies*, 2, 107-124.
- Hollander, E.P. (1964). *Leaders, groups, and influence*. New York: Oxford University Press.
- Hollander, E.P. (1992). Leadership, followership, self, and others. *Leadership Quarterly*, 3(1), 43-54.
- Hollander, E.P., & Julian, J.W. (1969). Contemporary trends in the analysis of leadership processes. *Psychological Bulletin*, 71(5), 387-397.
- Howard, J.A. (1994). A social cognitive conception of social structure. *Social Psychology Quarterly*, 57(3), 210-227.

- Hunter, D.R., Goodreau, S.M., & Handcock, M.S. (2008). Goodness of Fit of Social Network Models. *Journal American Statistical Association*, 103, 248-258.
- Ibarra, H. (1993). Network centrality, power, and innovation involvement: Determinants of technical and administrative roles. *Academy of Management Journal*, 36(3), 471-501.
- Ibarra, H., Kilduff, M., & Tsai, W. (2005). Zooming in and out: Connecting individuals and collectivities at the frontier of organizational network research. *Organization Science*, 16(4), 359-371.
- Isenberg, D.J. (1986). Thinking and managing: A verbal protocol analysis of managerial problem solving. *Academy of Management Journal*, 29(4), 775-788.
- James, W. (1890). *The principles of psychology*. New York: Holt.
- Janicik, G.A., & Larrick, R.P. (2005). Social network schemas and the learning of incomplete networks. *Journal of Personality and Social Psychology*, 88(2), 348-364.
- Jordan, P.J., Ashkanasy, N.M., & Härtel, C.E.J. (2002). Emotional intelligence as a moderator of emotional and behavioral reactions to job insecurity. *Academy of Management Review*, 27(3), 361-37
- Jordan, P.J., & Troth, A.C. (2004). Managing emotions during team problem solving: Emotional intelligence and conflict resolution. *Human Performance*, 17(2), 195-218.
- Judge, T.A., Bono, J.E., Ilies, R., & Gerhardt, M.W. (2002). Personality and Leadership: A Qualitative and Quantitative Review. *Journal of Applied Psychology*, 87(4), 765-780.
- Judge, T.A., Colin, A.E., & Ilies, R. (2004). Intelligence and leadership: A quantitative review and test of theoretical propositions. *Journal of Applied Psychology*, 89(3), 542-552.

- Karakowsky, L., & Siegel, J.P. (1999). The effects of proportional representation and gender orientation of the task on emergent leadership behavior in mixed-gender work groups. *Journal of Applied Psychology*, 84, 620-631.
- Kayworth, T.R., & Leidner, D.E. (2001-2002). Leadership Effectiveness in Global Virtual Teams. *Journal of Management Information Systems*, 18(3), 7-41.
- Kellett, J.B., Humphrey, R.H., & Sleeth, R.G. (2002). Empathy and complex task performance: Two routes to leadership. *Leadership Quarterly*, 13(5), 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.
- Kilckul, J., & Neuman, G. (2000). Emergent leadership behaviors: the function of personality and cognitive abilities in determining teamwork performance and KSAS. *Journal of Business and Psychology*, 15(1), 27-51.
- Kilduff, M., Crossland, C., Tsai, W., & Krackhardt, D. (2008). Organizational network perceptions versus reality: A small world after all? *Organizational Behavior and Human Decision Processes*, 107, 15-28.
- Kilduff, M., & Tsai, W. (2003). *Social networks and organizations*. Thousand Oaks, CA: Sage Publications Inc.
- Kilduff, M., Tsai, W., & Hanke, R. (2006). A paradigm too far? A dynamic stability reconsideration of the social network research program. *Academy of Management Review*, 31(4), 1031-1048.

- Kouzes, J.M., & Posner, B.Z. (2004). Follower-oriented leadership. In J.M. Burns, G.R. Goethals, & G.J. Sorenson (Eds.), *Encyclopedia of leadership* (pp. 494–499). London: Sage Reference/Berkshire.
- Krackhardt, D., & Kilduff, M. (1999). Whether close or far: Social distance effects on perceived balance in friendship networks. *Journal of Personality and Social Psychology*, 76(5), 770-782.
- Levine, J.M., & Moreland, R.L. (2006). *Small Groups: Key Readings*. Psychology Press.
- Lewis, K.M. (2000). When leaders display emotion: how followers respond to negative emotional expression of male and female leaders. *Journal of Organizational Behavior*, 21, 221–234.
- Liu, P., & Wei, Y. (2009). Team potency moderates the relationship between shared leadership and team performance. *Paper presented at the 2009 International Conference on Business and Information (BAI), Kuala Lumpur, Malaysia*
- Livi, S., Kenny, D.A., Albright, L., & Pierro, A. (2008). A social relations analysis of leadership. *Leadership Quarterly*, 19, 235-248.
- Lopes, P.N., Nezlek, J.B., Schutz, A., Sellin, I., & Salovey, P. (2004). Emotional intelligence, and social interaction. *Personality and Social Psychology Bulletin*, 30(8), 1018-1034.
- Lopes, P.N., Salovey, P., & Straus, R. (2003). Emotional intelligence, personality, and the perceived quality of social relationships. *Personality and Individual Differences*, 35, 641-658.
- Lord, R.G. (1977). Functional leadership behavior: Measurement and relation to social power and leadership perceptions. *Administrative Science Quarterly*, 22, 114–133.
- Lord, R.G., & Brown, D.J., (2004). *Leadership processes and follower self-identity*. Mahwah, NJ: Lawrence Erlbaum Associates.

- Lord, R. G., Brown, D.J., & Freiberg, S.J. (1999). Understanding the dynamics of leadership: The role of follower self-concepts in the leader/follower relationship. *Organizational Behavior and Human Decision Processes*, 78(3), 167-203.
- Lord, R.G., Brown, D.J., & Harvey, J.L. (2001). System Constraints on leadership perceptions, behaviour, and influence: An example of connectionist level processes. In J.A. Hogg & R.S. Tindale (Eds.), *Blackwell handbook of social psychology: Group processes* (pp. 283–310). Oxford, UK: Blackwell.
- Lord, R.G., Brown, D.J., Harvey, J.L., & Hall, R.J. (2001). Contextual constraints on prototype generation and their multi-level consequences for leadership perceptions. *Leadership Quarterly*, 12, 311–338.
- Lord, R.G., DeVader, C.L., & Allinger, G.M. (1986). A meta-analysis of the relation between personality traits and leadership: An application of validity generalization procedures. *Journal of Applied Psychology*, 71, 403–410.
- Lord, R.G., Foti, R.J., & De Vader, C.L. (1984). A test of leadership categorization theory: Internal structure, information processing, and leadership perceptions. *Organizational Behavior and Human Performance*, 34, 343–378.
- Lord, R.G., & Hall, R.J. (2005). Identity, deep structure and the development of leadership skill. *Leadership Quarterly*, 16, 591–615.
- Lubbers, M. J., & Snijders, T. A. B. (2007). A comparison of various approaches to the exponential random graph model: A reanalysis of 102 student networks in school classes. *Social Networks*, 29, 489-507.

- Lusher, D. (2006). *Masculinity in local contexts: Structural, individual and cultural interdependences*. PhD thesis, University of Melbourne, Australia.
- Mahar, C., & Mahar, T. (2004). *Emergent leadership: Toward an empirically verifiable model*. Paper prepared for the Canadian Forces Leadership Institute.
- Mann, R.D. (1959). A review of the relationship between personality and performance in small groups. *Psychological Bulletin*, 56, 241-270.
- Manz, C.C., & Sims, H.P., Jr. (1984). Searching for the “unleader”: Organizational member views on leading self-managed groups. *Human Relations*, 37, 409-424.
- Marsh, H. W. (1990). A multidimensional, hierarchical self-concept: Theoretical and empirical justification. *Educational Psychology Review*, 2, 77–171.
- Marsh, H. W. (1993). Academic self-concept: Theory, measurement, and research. In J. Suls (Ed.), *Psychological perspectives on the self* (pp. 59–98). Hillsdale, NJ: Erlbaum.
- Marsh, H.W., Byrne, B.M., & Yeung, A.S. (1999). Causal ordering of academic self-concept and achievement: Reanalysis of a pioneering study and revised recommendations. *Educational Psychologist*, 34, 154–157.
- Marsh, H.W., Chanal, J.P., Sarrazin, P.G., & Bois, J.E. (2005). Self-belief does make a difference: A reciprocal effects model of the causal ordering of physical self-concept and gymnastics performance. *Journal of Sport Sciences*, 27, 53–70.

- Marsh, H.W., & Craven, R. (1997). Academic self-concept: Beyond the dustbowl. In G. Phye (Ed.), *Handbook of classroom assessment: Learning, achievement, and adjustment* (pp. 131–198). Orlando, FL: Academic Press.
- Marsh, H.W., & Craven, R. (2006). Reciprocal effects of self-concept and performance from a multidimensional perspective. *Perspectives on Psychological Science*, 1, 133-163.
- Marsh, H.W., Papaioannou, A., & Theodorakis, Y. (2006). Causal ordering of physical self-concept and exercise behavior: Reciprocal effects model and the influence of physical education teachers. *Health Psychology*, 25, 316-328.
- Marsh, H.W., & Perry, C. (2005). Does a positive self-concept contribute to winning gold medals in elite swimming? The causal ordering of elite athlete self-concept and championship performances. *Journal of Sport & Exercise Psychology*, 27, 71–91.
- Martín-Albo, J., Núñez, J.L, Navarro, J.G., & Grijalvo, F. (2007). The Rosenberg self-esteem scale: Translation and Validation in University Students. *Spanish Journal of Psychology*, 10(2), 458-467.
- Mayer, J.D., & Salovey, P. (1997). What is emotional intelligence? In P. Salovey & D. Sluyter (Eds). *Emotional Development and Emotional Intelligence: Implications for Educators* (pp. 3-31). New York: Basic Books.
- 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.

- Mayer, J.D., Salovey, P., Caruso, D.R., & Sitarenios, G. (2003). Measuring emotional intelligence with the MSCEIT, *Emotion*, 3, 97-105.
- Mayer, J.D., Roberts, R.D., & Barsade, S.G. (2008). Human abilities: emotional intelligence. *Annual Review of Psychology*, 59, 507–536.
- McEnrue, M.P., & Groves, K. (2006). Choosing among tests of emotional intelligence: What is the evidence. *Human Resource Development Quarterly*, 17(1), 9-42.
- Mehra, A., Dixon, A.L., Brass, D.J., & Robertson, B. (2006). The social network ties of group leaders: Implications for group performance and leader reputation. *Organization Science*, 17(1), 64-79.
- Mehra, A., Kilduff, M., & Brass, D.J. (2001). The social networks of high and low self-monitors: implications for the workplace performance. *Administrative Science Quarterly*, 46(1), 121-146.
- Mehra, A., Smith, B.R., Dixon, A.L., & Robertson, B. (2006). Distributed leadership in teams: the network of leadership perceptions and team performance. *Leadership Quarterly*, 17, 232-245.
- Meindl, J. (1993). Reinventing leadership: A radical, social psychological approach. In J. K. Murnighan (Ed.), *Social psychology in organizations* (pp. 89–118). Englewood Cliffs, NJ: Prentice Hall.
- Midkiff, R. M., Burke, J. P., Hunt, J. P., & Ellison, G. C. (1986). The role of self-concept of academic attainment in achievement-related behaviors. *Psychological Reports*, 58, 151-159.
- Morgeson, F.P., DeRue, D.S., & Karam, E.P. (2010). Leadership in teams: A functional approach to understanding leadership structures and processes. *Journal of Management*, 36(1): 5-39.

- Moss, S.E., & Kent, R.L. (1996). Gender and gender-role categorization of emergent leaders: A critical review and comprehensive analysis. *Sex Roles*, 35, 79-96.
- Mullen, B., Johnson, C., & Salas, E. (1991). Effects of communication network structure: Components of positional centrality. *Social Networks*, 13(2), 169-185.
- Neubert, M.J., & Taggar, S. (2004). Pathways to informal leadership: the moderating role of gender on the relationship of individual differences and team member network centrality to informal leadership emergence. *Leadership Quarterly*, 15, 175-194.
- Nicholls, J. (1979). Development of perception of attainment and causal attributions for success and failure in reading. *Journal of Educational Psychology*, 71, 94-99.
- Offstein, E.H., Madhavan, R., & Gnyawali, D.R. (2006). Pushing the frontier of LMX research: The contribution of triads. In G. Graen & J.A. Graen (Eds.) *Sharing network leadership*. Greenwich CT: Information Age Publishing.
- Oh, H., Chung, M.H., & Labianca, G. (2003). Group social capital and group effectiveness. *Working paper*, Management Department. Hong Kong University of Science and Technology.
- Papadogiannis, P.K., Logan, D., & Sitarenios, G. (2009). An ability model of emotional intelligence: A rationale, description, and application of the Mayer Salovey Caruso Emotional Intelligence Test (MSCEIT). In C. Stough et al. (Eds.) *Assessing Emotional Intelligence* (pp. 43-65). The Springer Series on Human Exceptionality.
- Pearce, C.L, Conger, J.A., & Locke, E.A. (2007). Shared leadership theories. *Leadership Quarterly*, 18, 281-288.

- Pescosolido, A.T. (2002). Emergent leaders as managers of group emotion. *Leadership Quarterly*, 13, 583-599.
- Pielstick, D.C. (2000). Formal vs. informal leading: A comparative analysis. *Journal of Leadership & Organizational Studied*, 7(3), 99-114.
- Ridgeway, C.L. (2006). Linking social structure and interpersonal behavior: A theoretical perspective on cultural schemas and social relations. *Social Psychology Quarterly*, 69(1), 5-16.
- Robins, G., & Boldero, J. (2003). Relational discrepancy theory: The implications of self-discrepancy theory for dyadic relationships and for the emergence of social structure. *Personality and Social Psychology Review*, 7(1), 56-74.
- Robin, G., Pattison, P. E., & Woolcock, J. (2005). Social networks and small words. *American Journal of Sociology*, 110, 894-936.
- Robin, G., Pattison, P. E., Kalish, Y., & Lusher, D. (2007). An introduction to exponential random graph ( $p^*$ ) models for social networks. *Social Networks*, 29, 173-191.
- Rogers, C.R. (1951). *Client-centered therapy*. Boston: Houghton Mifflin.
- Rosenberg, M. (1989). *Society and the adolescent self-image*. Middletown, CT: Wesleyan University Press.
- Schneider, C.E., & Goktepe, J.R. (1983). Issues in emergent leadership: The contingency model of leadership, leader sex, and leader behavior. In H.H. Blumberg, A.P. Hare, V. Kent, & M.F. Davies (Eds.), *Small groups and social interaction*. Chicester, England: Wiley.
- Seibert, S.E., Kraimer, M.L., & Liden, R.C. (2001). A social capital theory of career success. *Academy of Management Journal*, 44(2), 219-237.

- Shaffer, D. R. (2008). *Social and personality development*. Belmont, CA: Wadsworth, Cengage Learning
- Shamir, B., House, R. J., & Arthur, M. B. (1993). The motivational effects of charismatic leadership: A self-concept based theory. *Organization Science*, 4(4), 557-594.
- Sheridan, J., Vredenburg, D., & Adelson, M. (1984). Contextual model of leadership influence in hospital units. *Academy of Management Journal*, 27, 57–78.
- Snijders, T.A.B. (2005). Models for Longitudinal Network Data. In P. Carrington, J. Scott, & S. Wasserman (Eds.), *Models and methods in social network analysis* (Chapter 11). New York: Cambridge University Press.
- Snijders, T.A.B. (2006). Statistical Methods for Network Dynamics. In S. R. Luchini et al. (Eds.), *Proceedings of the XLIII Scientific Meeting, Italian Statistical Society* (pp. 281—296). Padova: CLEUP.
- Snijders, T.A.B. (2009). Longitudinal methods of network analysis. In B. Meyers (Ed.), *Encyclopedia of Complexity and System Science* (pp. 5998-6013). Springer Verlag.
- Snijders, T.A.B., Pattison, P.E., Robins, G.L., & Handcock, M.S. (2006). New specifications for exponential random graph models. *Sociological Methodology*, 36(1), 99-153.
- Snijders, T.A.B. Steglich, C.E.G., & van de Bunt, G.G. (2010). Introduction to actor-based models for network dynamics. *Social Networks*, 32, 44-60.
- Snijders, T.A.B., Steglich, C.E.G., & Schweinberger, M. (2007). Modeling the co-evolution of networks and behavior. In K. van Montfort, H. Oud & A. Satorra (Eds.), *Longitudinal models in the behavioral and related sciences* (pp. 41-71). Mahwah, NJ: Lawrence Erlbaum.

- Snyder, M. (1974). Self-monitoring of expressive behavior. *Journal of Personality and Social Psychology*, 30, 526-537.
- Sorrentino, R.M., & Field, N. (1986). Emergent leadership over time: The functional value of positive motivation. *Journal of Personality and Social Psychology*, 50, 1091–1099.
- Sparrowe, R. T. (2005). Authentic leadership and the narrative self. *Leadership Quarterly*, 16, 419-439.
- Sparrowe, R.T., & Liden, R.C. (2005). Two routes to influence: Integrating leader -member exchange and network perspectives. *Administrative Science Quarterly*. 50(4), 505-535.
- Sparrowe, R.T., Liden, R.C., Wayne, S.J., & Kraimer, M.L. (2001). Social networks and the performance of individuals and groups. *Academy of Management Journal*, 44(2), 316-325.
- Sparrowe, R.T, Soetjipto, B.W., & Kraimer, M.L. (2006). Do leaders' influence tactics relate to members' helping behavior? It depends on the quality of the relationship. *Academy of Management Journal*, 49, 1194–208.
- Spreitzer, G.M. (1996). Social structural characteristics of psychological empowerment. *Academy of Management Journal*, 39(2), 483-504.
- Steglich, C.E.G., Snijders, T.A.B. & Pearson, M. (2010). Dynamic Networks and Behavior: Separating Selection from Influence. *Sociological Methodology*, To be published.
- Taggar, S., Hackett, R., & Saha, S. (1999). Leadership emergence in autonomous work teams: antecedents and outcomes. *Personnel Psychology*, 52, 899–926.
- Tsai, W., & Ghoshal, S. (1998). Social capital and value creation: The role of intrafirm networks. *Academy of Management Journal*, 41(4), 464-476.

- Uhl-Bien M. (2006). Relational leadership theory: exploring the social processes of leadership and organizing. *Leadership Quarterly*, 17, 654–76.
- Valacich, J.S., Jung, J.H., & Looney, C.A. (2006). The effects of individual cognitive ability and idea stimulation on idea-generation performance. *Group Dynamics: Theory, Research, and Practice*, 10(1), 1-15.
- van de Bunt, G.G., & Groenewegen, P. (2007). An Actor-Oriented Dynamic Network Approach: The Case of Interorganizational Network Evolution. *Organizational Research Methods*, 10, 463-482.
- Van den bergh, B.R.H. (2006). Influences of distal and proximal family environment variables on the pre-adolescents' self-concept. In A. P. Prescott (Ed.), *The concept of self in education, Family and Sports* (pp. 153-177). New York: Nova Science.
- Van der Mescht, H (2004). Phenomenology in education: A case study in educational leadership. *Indo-Pacific Journal of Phenomenology*, 4(1), 1-16.
- van Knippenberg, D., & Hogg, M. A. (2003). A social identity model of leadership effectiveness in organizations. In B. M. Staw & R. M. Kramer (Eds.), *Research in organizational behavior* (pp. 243-297). Amsterdam: Elsevier
- van Knippenberg, D., van Knippenberg, B., De Cremer, D., & Hogg, M. A. (2004). Leadership, self, and identity: A review and research agenda. *Leadership Quarterly*, 15, 825-856.
- Van Vugt, M., & De Cremer, D. (1999). Leadership in social dilemmas: The effects of group identification on collective actions to provide public goods. *Journal of Personality and Social Psychology*, 76(4), 587-599.

- Wagner, J.A. (1995). Studies of individualism-collectivism: effects cooperation in groups. *Academy of Management Journal*, 38, 152-172.
- Wentworth, D.K., & Anderson, L.R. (1984). Emergent leadership as a function of sex and task type. *Sex Roles*, 11, 513-524.
- Wheelan, S.A., & Johnston, F. (1996). The role of informal member leaders in a system containing formal leaders. *Small Group Research*, 27, 33-55.
- Wiley, S., Perkins, K., & Deaux, K. (2008). Through the looking glass: Ethnic and generational patterns of immigrant identity. *International Journal of Intercultural Relations*, 32(5), 385-398.
- Wolff, S.B. (2002). Many faces of emotional leadership. *Leadership Quarterly*, 13, 493-504.
- Wolff, S.B., Pescosolido, A.T., & Druskat, V.U. (2002). Emotional intelligence as the basis for leadership emergence in self-managing teams. *Leadership Quarterly*, 13, 505-522.
- Wood, M. (2005). The fallacy of misplaced leadership. *Journal of Management Studies*, 42(6), 1101-1121.
- Yammarino, F.J., Dionne, S.D., Chun, J.U., & Dansereau, F. (2005). Leadership and levels of analysis: A state-of-the-science review. *Leadership Quarterly*, 16, 879-919.
- Yeung, K. T., & Martin, J. L. (2003). The looking glass self: An empirical test and elaboration. *Social Forces*, 81(3), 843-879.
- Yoo, Y., & Avali, M. (2004). Emergent leadership in virtual teams: what do emergent leaders do? *Information and Organization*, 14, 27-58.
- Yukl, G. (1998). *Leadership in organizations* (4<sup>th</sup> Edition). NJ: Prentice Hall.

Yukl, G. (2010). *Leadership in organizations* (7<sup>th</sup> Edition). NJ: Prentice Hall.

Zaccaro, S.J., Foti, R.J., & Kenny, D.A. (1991). Self-monitoring and trait-based variance in leadership: An investigation of leader flexibility across multiple group situations. *Journal of Applied Psychology*, 76, 308-315.

Zajonc, R.B., & Bumstein, E. (1965). Structural balance, reciprocity, and positivity as sources of cognitive bias. *Journal of Personality*, 33, 570-583.

## APPENDIX

### NETWORK MEASURES

#### *Initial Friendships*

**Directions:** Below you will find a list of names of all the people who are involved in the exchange between the Virginia Tech and the University of Lugano (USI). In this section, please indicate whom you consider to be a *personal friend*.

Please place a check next to the peoples' names whom you consider to be personal friends with. If there is only one person you consider as being your personal friend, then just check that one person's name. If you are travelling with several personal friends, then check these several names. If you do not know anyone, then do not check any names.

Names	Friend?
-------	---------

Actor 1	
---------	--

....

Actor n	
---------	--

### *Monthly Social Interactions*

**Directions:** Below you will find a list of names of all the people who are involved in the Lugano study abroad program. Some of these people you may interact with quite frequently; others you may not interact with much. Think about the interactions you had this **past month**. Please check the number of hours that you spend with each person in Lugano (i.e., not traveling) outside of class and class-work **per week** (not including the hours you're sleeping in your room with your roommate[s]).

<b>Names</b>	<b>0 hours</b>	<b>1-3 hours</b>	<b>4-6 hours</b>	<b>7-10 hours</b>	<b>Over 10 hours</b>
Actor 1					
....					
Actor n					

### *Travel-Leader*

In the past month, who you perceive as a leader for the group when it comes to travel? Please place a check by the names of each person you saw as a leader when it came to **travel this past month**.

<b>Names</b>	<b>Leaders?</b>
Actor 1	
....	
Actor n	

***Class-Leader***

In the past month, who you perceived as a leader for the group when it comes to class? Please place a check by the names of each person you saw as a leader when it came to **the class you took this past month.**

Names	Leaders?
-------	----------

Actor 1	
---------	--

....

Actor n	
---------	--

***People-Leader***

In the past month, who you saw as a person to whom people in the group go to when they are upset or need personal support? Please place a check by the names of each person you saw as a person to whom people in the group went when they were upset (people leader) **this past month.**

Names	Leaders?
-------	----------

Actor 1	
---------	--

....

Actor n	
---------	--



***Self-Esteem Scale***

For each of the following items, please indicate whether you agree or disagree by circling the most applicable response.

1. I feel that I'm a person of worth, at least on an equal plane with others.

Strongly disagree	Disagree	Agree	Strongly Agree
----------------------	----------	-------	-------------------

2. I feel that I have a number of good qualities.

Strongly disagree	Disagree	Agree	Strongly Agree
----------------------	----------	-------	-------------------

3. All in all, I am inclined to feel that I am a failure.

Strongly disagree	Disagree	Agree	Strongly Agree
----------------------	----------	-------	-------------------

4. I am able to do things as well as most other people.

Strongly disagree	Disagree	Agree	Strongly Agree
----------------------	----------	-------	-------------------

5. I feel I do not have much to be proud of.

Strongly disagree	Disagree	Agree	Strongly Agree
----------------------	----------	-------	-------------------

6. I take a positive attitude toward myself.

Strongly disagree	Disagree	Agree	Strongly Agree
----------------------	----------	-------	-------------------

7. On the whole, I am satisfied with myself.

Strongly  
disagree

Disagree

Agree

Strongly  
Agree

8. I wish I could have more respect for myself.

Strongly  
disagree

Disagree

Agree

Strongly  
Agree

9. I certainly feel useless at times.

Strongly  
disagree

Disagree

Agree

Strongly  
Agree

10. At times I think I am no good at all.

Strongly  
disagree

Disagree

Agree

Strongly  
Agree

### ***Self-Monitoring Scale***

The statements below concern your personal reactions to a number of different situations. No two statements are exactly alike, so consider each statement carefully before answering. If a statement is TRUE or MOSTLY TRUE as applied to you, circle the "T" next to the question. If a statement is FALSE or NOT USUALLY TRUE as applied to you, circle the "F" next to the question.

- (T) (F) 1. I find it hard to imitate the behavior of other people.
- (T) (F) 2. My behavior is usually an expression of my true inner feelings, attitudes, and beliefs.
- (T) (F) 3. At parties and social gatherings, I do not attempt to do or say things that others will like.
- (T) (F) 4. I can only argue for ideas which I already believe.
- (T)(F) 5. I can make impromptu speeches even on topics about which I have almost no information.
- (T) (F) 6. I guess I put on a show to impress or entertain people.
- (T) (F) 7. When I am uncertain how to act in a social situation, I look to the behavior of others for cues.
- (T) (F) 8. I would probably make a good actor.
- (T) (F) 9. I rarely seek the advice of my friends to choose movies, books, or music.
- (T) (F) 10. I sometimes appear to others to be experiencing deeper emotions than I actually am.
- (T) (F) 11. I laugh more when I watch a comedy with others than when alone.
- (T) (F) 12. In groups of people, I am rarely the center of attention.
- (T) (F) 13. In different situations and with different people, I often act like very different persons.
- (T) (F) 14. I am not particularly good at making other people like me.
- (T) (F) 15. Even if I am not enjoying myself, I often pretend to be having a good time.
- (T) (F) 16. I'm not always the person I appear to be.

(T) (F) 17. I would not change my opinions (or the way I do things) in order to please someone else or win their favor.

(T) (F) 18. I have considered being an entertainer.

(T) (F) 19. In order to get along and be liked, I tend to be what people expect me to be rather than anything else.

(T) (F) 20. I have never been good at games like charades or improvisational acting.

(T) (F) 21. I have trouble changing my behavior to suit different people and different situations.

(T) (F) 22. At a party, I let others keep the jokes and stories going.

(T) (F) 23. I feel a bit awkward in company and do not show up quite as well as I should.

(T) (F) 24. I can look anyone in the eye and tell a lie with a straight face (if for a right end).

(T) (F) 25. I may deceive people by being friendly when I really dislike them.