The process of a network project

Define Problem
(What Question Are We Trying to Answer?)

Redefine the Questions?

Locate Data Sources

Not Enough Data?

Crawl/Search Data Sources Based on Keywords

Need to Expand Scope (Keyword)?

Create Data Model

Run Analytics

Augment Tools

Choose Tool

Interpret Results

Develop Insights
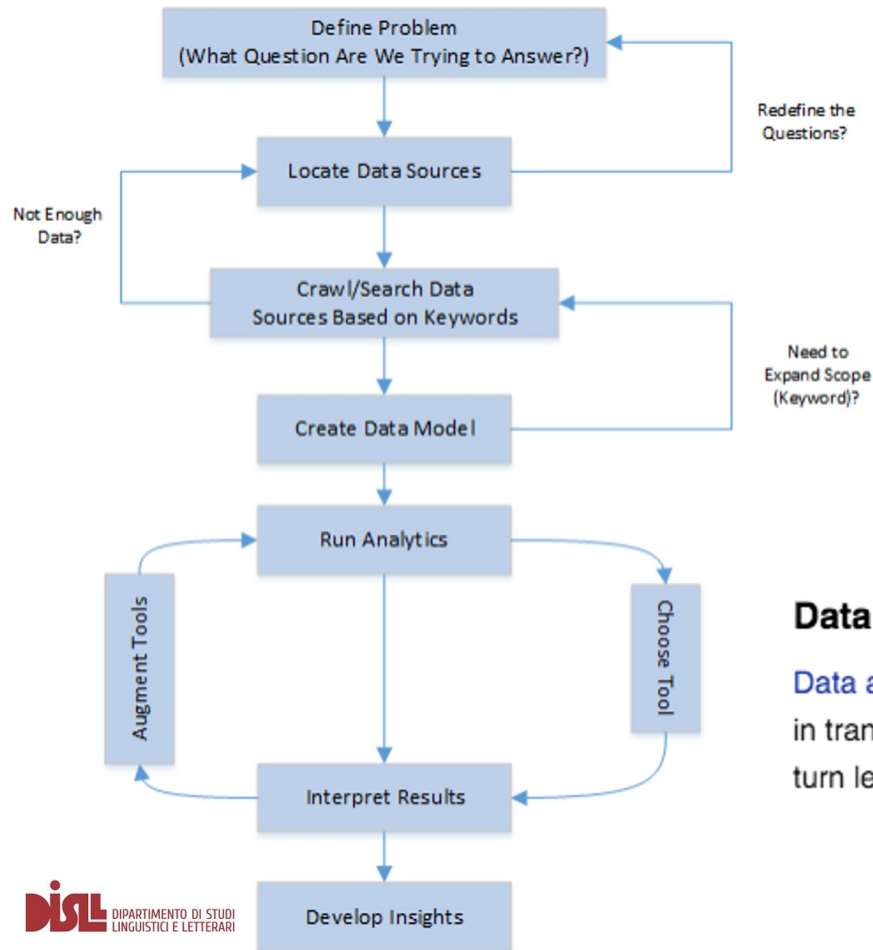
Data analysis

Data analysis is the set of activities that assist in transforming raw data into insight, which in turn leads to a new base of knowledge

DISLL DIPARTIMENTO DI STUDI LINGUISTICI E LETTERARI

42

Define Problem and Purpose

- a description of the problem at hand

- Contextualization: provide a background

- an outline of your objectives and their implications

Contextualize Problem

- Make a literature search
- Identitfy relevant theories and evidence->master the subject!!!
- address alternative perspectives
- make connections between different sources
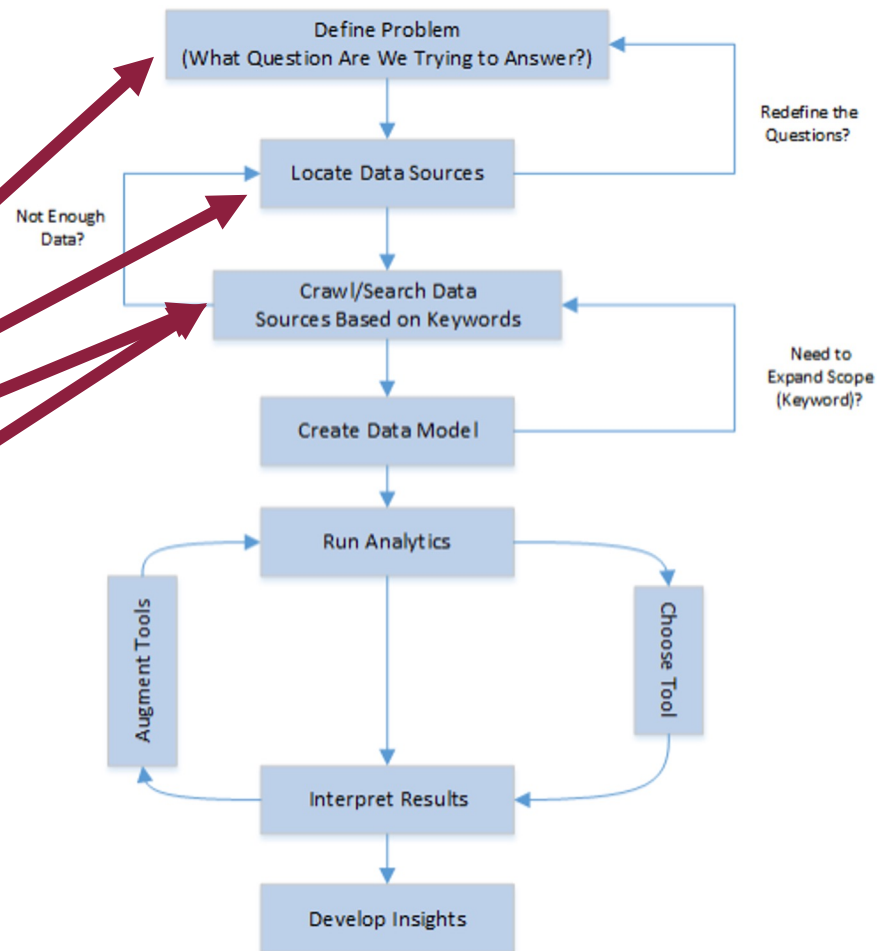- offer new insights.

Specify

an outline of your main
arguments/hypotheses

Selecting the data

- Definition of the social network
- Definition of network boundaries
- Selecting within the boundaries
- Sampling within the boundaries

- Pag 53-62
- John Scott
- Social Network Analyis
- Sage Publications (see Moodle)

Definition of the network

Theoretical definition>operationalization

(more in a dedicated lecture)

When we want to study a social network the first step is to define it.

NODES=???

LINKS=????

Definition of the network: e.g. networks of people

- Maybe participanst are not aware of ties between their social supporters

- Solution: objective measures (e.g., co-publications of supporters)

- Class mates

- Colleagues: belonging to same organization

- Political affiliation: enroled in a party???

- Collaborators: working to the same project? Co-authors?

- Friends: how do you define friendship?
  - *CRITERIA: number of interactions? Quality of the relationship? Self determination? Top 5? Top 3?*

Identification of Network Boundaries

Formal vs. informal group

Risk: ARTIFICIAL boundaries

From theoretical definition to empirical criteria

-> transparent inclusion/exclusion criteria allow:

- replicability of the results

- generealizability of the findings

Selecting within the boundaries

Three main stategies:

■ Random selection

■ Reputational approach

■ Identification of roles

Representative random sample

- reproduces the relevant characteristics of the reference population (age, gender, level of education, socio-economic, political orientation ...)

- Is this a good procedure?

Representative random sample

- a representative sample of individual respondents does not correspond to a sample representation of their relationships !!!!

- At most I can get basic and self-centered info:

E.g. We could get info on the density of the Italians' network of friends by asking a representative sample how many "friends" they have, but you cannot know for example anything about reciprocity or the level of cohesion of the group of friends

People network analysis

Mention your main sources of information

- Who have you spoken with about politics?
- List the last 6 people you have spoken to.

The Effect of Social Networks on the Quality of Political Thinking

Elif Erisen
California Polytechnic State University and Bilkent University

Cengiz Erisen
TOBB University of Economics and Technology

In this article we investigate the effect of social networks on the quality of political thinking. First, the article introduces new social network concepts into the literature and develops the corresponding measures. Second, the article explores the quality of political thinking as a concept and develops its measures based on the volume and the causality of thoughts, and their integrative complexity. We make use of a survey to collect information on social networks and the experimental manipulation controls for the effect of policy frames. Our findings consistently show the significant negative impact of cohesive social networks on the quality of policy-relevant thinking. We conclude that close-knit social networks could create "social bubbles" that would limit how one communicates with others and reasons about politics.

Selecting: reputational approach

- Premise: you have the (almost) full list of the entire population

- Then you can build the entire network on the base of the information about the links

- E.g., ask to every node about their relation with the other nodes (mention your friends)

- E.g., observing common behaviours (the node are linked if they share something_ go to the same party, to the same conference, wear the same brands etc)

Selecting: reputational approach

■ Premise: you do not have a list of the entire population

■ The list is created starting by a group of judges (nominees), that are asked nominate the member of the target population (i.e., the nodes of the network)

- *knowledgeable informants*

- *a sample of «users»*

Selecting: reputational approach

- **OPTION 1: The nominees are independent from social relations under investigation** (this eliminates a methodological circularity)

e.g. A group of real estates agents nominates the most promising spots in the city. The houses for sell in that spots could be in the network, and you can build a network based on co-visits to implement marketing strategies

- **OPTION 2: Snow ball: Every Judge nominates 3 further judges**

In this case the shape of the outcome network will be highly contaminated by the initial selection. But this can work in specific cases (for example, the initial selection involves a very influential / important person as the starting point)

 e.g. building a mafia ntw

Sampling: positional or structura approach

■ Premise: you have a list of the entire population

■ Make an ordered list of possible participants (possible nodes), namely list the entire target population

  – *E.g.: I make the list of the influencers promoting a specific product*
  – *E.g.: I make the list of the political leaders*

■ Rank the list according to a meaningful criterion

  – *E.g.: Rank the influencers by number of followers*
  – *E.g.: Rank the leaders according to number of votes*

■ Select cut off

E.g.: top 10, top 100 by centrality, by brokerage

■ Problem: justify your cut off: a cut off implies that you have subgroups

E.g. top 10 are one group, from the 11th they belong to a different group

■ The better you initially define your network, the less problems you will encounter in arguing and identifying the inclusion/exclusion criteria

Sampling: positional or structura approach

- Assumption: agents in a similar structural location within the NTW share social attributes

- Eg: I expect the hubs/brokers in the network (e.g., most cited scientists) to be white male.

- E.g. identify the hubs/brokers in the networks and then I code their socio-demographic characteristics.

Exemplary research using NTW of people

CrossMark

Why extraversion is not enough: the mediating role of initial peer network centrality linking personality to long-term academic performance
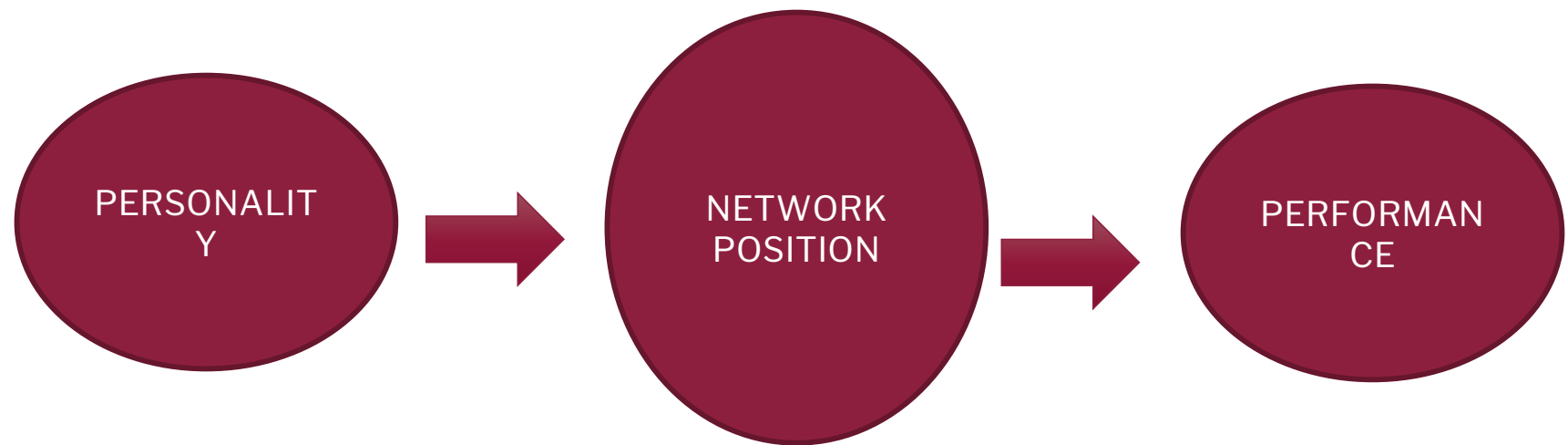
Lisa Thiele[1] · Nils Christian Sauer[1] · Simone Kauffeld[1]

Research question:

■ Does network structure mediate the relationship between PERSONALITY TRAITS and performance?

PERSONALITY → NETWORK POSITION → PERFORMANCE

Extraversion refers to the extent to which people are outgoing, active, gregarious, assertive, energetic, enthusiastic, and cheerful in their outlook (McCrae and John 1992).

Theoretical background

SOCIAL CAPITAL THEORY

specific positions within a social network -> access to resources (support, sponsorship, information)

1. developmental network relationships are critical for career development (Cummings and Higgins 2006)

2. highly extroverted people perform better (e.g., Ng et al. 2005)

3. extraverts are more central and have larger networks (Pollet et al. 2011).

4. In the organizational setting, personality partially predict performance (i.e., job performance and career success) through network position (Fang et al. 2015).

Conscientiousness

Dependability

Grit

Organization

Persistence

Planning

Punctuality

Responsibility

Agreeableness

Collaboration

Collegiality

Generosity

Honesty

Integrity

Kindness

Trustworthiness

Big Five

Extraversion

Assertiveness

Cheerfulness

Communication

Optimism

Leadership

Liveliness

Sociability

Emotional Stability

Confidence

Coping with Stress

Moderation

Resilience

Self-Esteem

Self-Consciousness

Self-Regulation

Openness to Experience

Curiosity

Creativity

Global Awareness

Growth Mindset

Imagination

Innovation

Tolerance

OCEAN

Extroversion

Highly extroverted people

- perform better (e.g., Ng et al. 2005).

- are more central in the network

- have larger networks (see Landis 2015, for a review)

- are proactive in seeking such ntw ties and welcoming new interactions (Dougherty et al. 2008).

- are outgoing, active, energetic, and gregarious (McCrae & John 1992).

- attract social attention and enjoy being the object of such attention, which promotes the initial formation of relationships (Ashton et al. 2002; Shipilov et al. 2014).
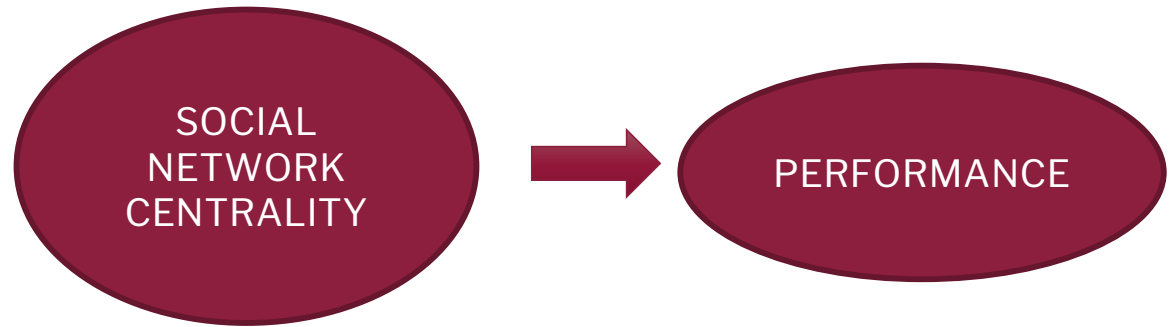
EXTROVERSION → SOCIAL NETWORK CENTRALITY
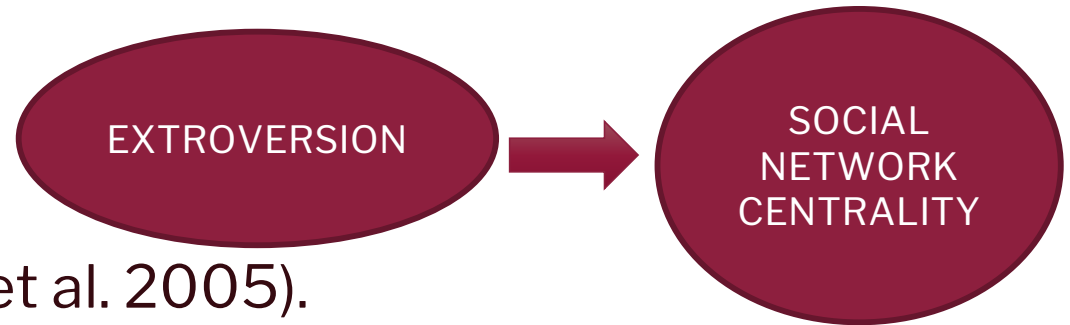
Hypothesis 1

Extraversion positively impacts social network centrality
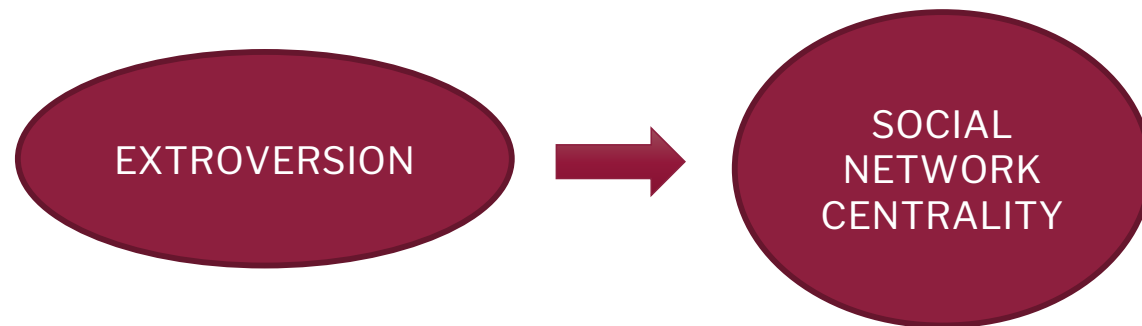
NTW CENTRALITY

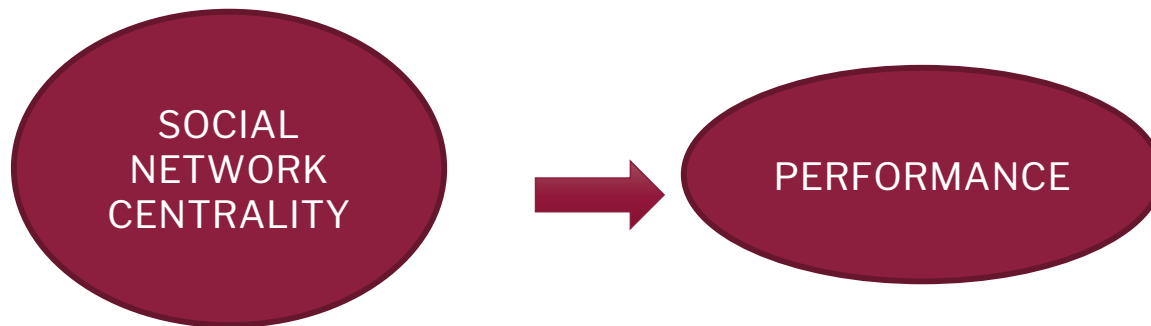SOCIAL NETWORK CENTRALITY → PERFORMANCE

Social network theory emphasizes that individuals occupying central positions within the network outperform their less central counterparts because their network provides access to (non-redundant) information and other resources (e.g., social support; for reviews, see Burt et al. 2013; Kilduff and Brass 2010).

central students in (emergent) social networks (e.g., friendship, commu-nication) get better grades due to their superior access to information, knowledge, and social support (e.g., Baldwin et al. 1997; Cho et al. 2007; Gašević et al. 2013; Hommes et al. 2012; Rizzuto et al. 2009; Smith and Peterson 2007).

Hypothesis 2
Social network centrality positively impacts academic performance.

MEDIATION

In a recent meta-analysis, network position (i.e., indegree centrality) partially mediated the effects of various personality traits on job performance (Fang et al. 2015).

More on this later....

Hypothesis 3

Social network centrality mediates the impact of extraversion on academic performance.
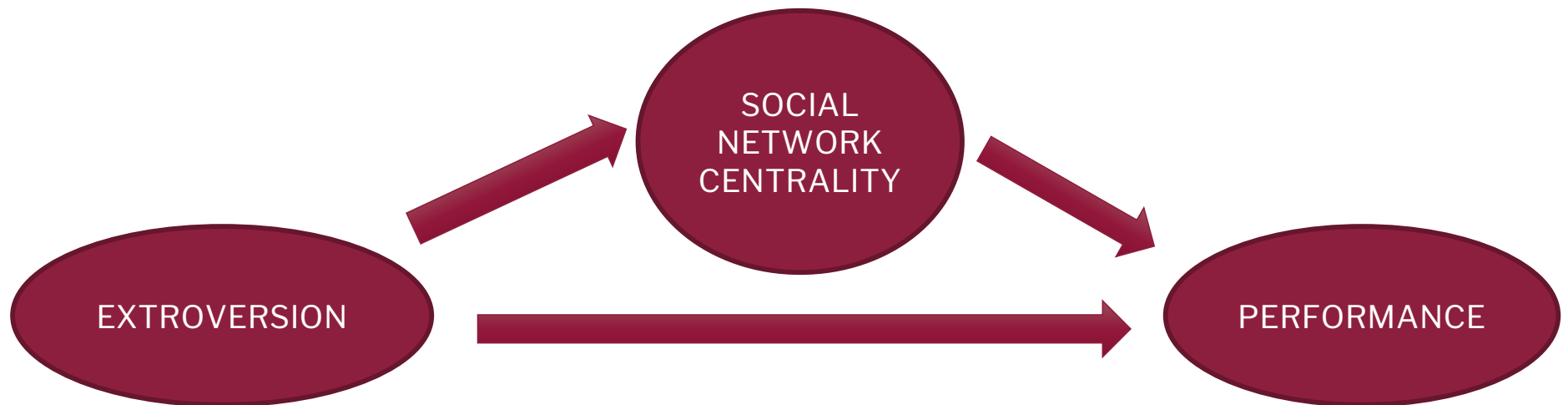
Field of application: UNDERGROUDATE STUDENTS

Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of research in Personality, 41*(1), 203-212.

Appendix A. Big Five Inventory-10 (BFI-10)

English version.
Instruction: How well do the following statements describe your personality?

I see myself as someone who …	Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree strongly
… is reserved	(1)	(2)	(3)	(4)	(5)
… is generally trusting	(1)	(2)	(3)	(4)	(5)
… tends to be lazy	(1)	(2)	(3)	(4)	(5)
… is relaxed, handles stress well	(1)	(2)	(3)	(4)	(5)
… has few artistic interests	(1)	(2)	(3)	(4)	(5)
… is outgoing, sociable	(1)	(2)	(3)	(4)	(5)
… tends to find fault with others	(1)	(2)	(3)	(4)	(5)
… does a thorough job	(1)	(2)	(3)	(4)	(5)
… gets nervous easily	(1)	(2)	(3)	(4)	(5)
… has an active imagination	(1)	(2)	(3)	(4)	(5)

German version.
Instruction: Inwieweit treffen die folgenden Aussagen auf Sie zu?

Ich…	trifft überhaupt nicht zu	trifft eher nicht zu	weder noch	eher zutreffend	trifft voll und ganz zu
…bin eher zurückhaltend, reserviert.	(1)	(2)	(3)	(4)	(5)
…schenke anderen leicht Vertrauen, glaube an das Gute im Menschen.	(1)	(2)	(3)	(4)	(5)
…bin bequem, neige zur Faulheit.	(1)	(2)	(3)	(4)	(5)
…bin entspannt, lasse mich durch Stress nicht aus der Ruhe bringen.	(1)	(2)	(3)	(4)	(5)
…habe nur wenig künstlerisches Interesse.	(1)	(2)	(3)	(4)	(5)
…gehe aus mir heraus, bin gesellig.	(1)	(2)	(3)	(4)	(5)
… neige dazu, andere zu kritisieren.	(1)	(2)	(3)	(4)	(5)
…erledige Aufgaben gründlich.	(1)	(2)	(3)	(4)	(5)
…werde leicht nervös und unsicher.	(1)	(2)	(3)	(4)	(5)
…habe eine aktive Vorstellungskraft, bin phantasievoll.	(1)	(2)	(3)	(4)	(5)

Scoring the BFI-10 scales:
Extraversion: 1R, 6; Agreeableness: 2, 7R; Conscientiousness: 3R, 8; Neuroticism: 4R, 9; Openness: 5R; 10 (R = item is reversed-scored).

Optional additional Agreeableness item (true-scored):

English version
…is considerate and kind to almost everyone.	(1)	(2)	(3)	(4)	(5)
German version
…bin rücksichtsvoll zu anderen, einfühlsam.	(1)	(2)	(3)	(4)	(5)

Academic performance: grade point averages
GPA= mean of grades cumulated over weighted study modules, resulting in the final degree

Network definition: developmental peer networks
i.e., fellow students

RATIONALE: the most influential social networks consists of fellow students because peers provide psychosocial support within friendships, give each other relevant information and advice, and exchange knowledge when merging together within learning or project groups (see also Rodkin and Ryan 2012).

In the early stage of career development (i.e., at university), peer relationships play a particularly important developmental role (Murphy and Kram 2010) because students have no classic supervisors, co-workers, or subordinates yet.
 Instead, peers represent the largest pool of possible developmental relationships

NETWORK CONSTRUCTION

cohort of bachelor psychology students at a German public university

participants were asked to select fellow students from an **exhaustive name list**.

"choose students (a) "with whom they are friends," (b) "from whom they would seek advice," and (c) "with whom they would like to work together."
combined the three networks into a single developmental peer network.
-> relationship tie is present if specified in either of the single networks.

Network Boundaries

TEMPORAL BOUNDARIES: a longitudinal design with three data waves, taking students' entire undergraduate life into account.

NETWORK key element under investigation

indegree centrality

-> the extent to which a person is nominated by others as an affiliate (Freeman 1978; Wasserman and Faust 1994).

Indegree centrality was assessed by summing up all ingoing ties per person using the SNA package implemented in R (Butts 2016).

FINAL SAMPLE

47 students participated in all three data waves.
14.9% male, 85.1% female),
AGE M 21.72; SD = 5.6, range = 18–47 years

RESULTS

Table 1 Means, standard deviations, ranges, and intercorrelations of used measures ($N = 47$)

Measure		Mean	SD	Range	1	2	3	4
1	Extraversion T1	3.49	.79	1.75–4.75	(.81)	.35*	.50**	− .40**
2	Agreeableness T1	3.35	.76	1.75–4.75		(.67)	.15	− .13
3	Indegree centrality T2	7.70	3.97	1–18			–	− .44**
4	Academic performance (GPA) T3	1.62	.40	1.10–3.00				–

Two-tailed Pearson's correlations. Internal consistencies (Cronbach's alpha) appear on the diagonal
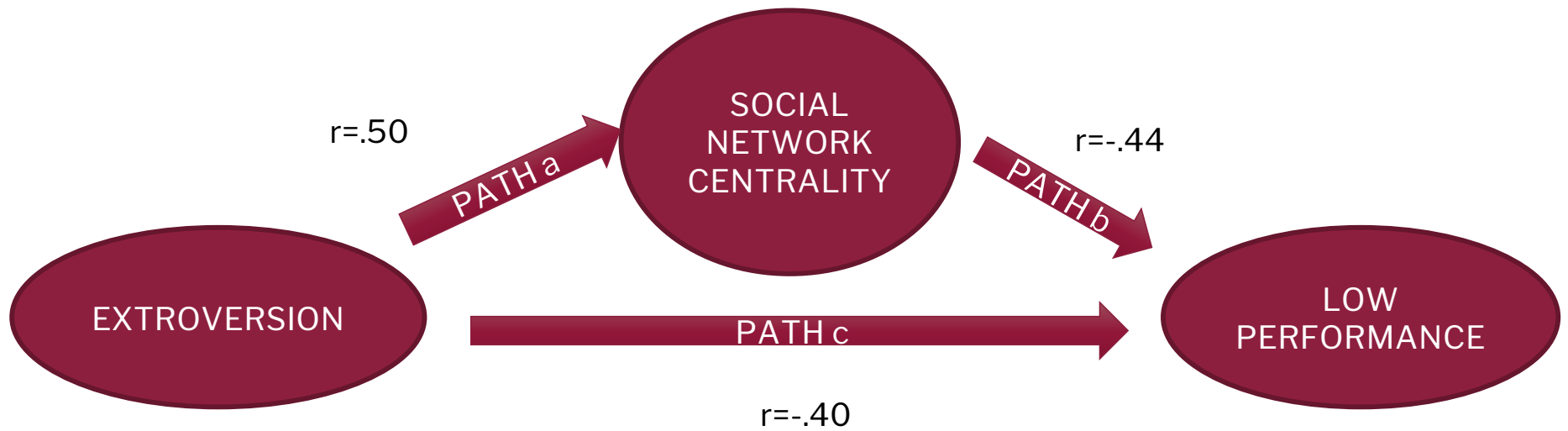
*$p < .05$

**$p < .01$

Table 2 Mediation model coefficients (hypotheses 1–3, N=47)

Path		Estimate	S.E.	t-value	CI limits
a	Extraversion → indegree centrality HYP 1	2.51***	.65	3.86	(1.20, 3.81)
b	Indegree centrality → performance HYP 2	− .03*	.02	−2.10	(−.06, −.01)
c′	Extraversion → performance (direct effect) HYP 3	− .12	.08	−1.57	(−.27, .03)
c	Extraversion → indegree centrality → performance (total effect)	− .20**	.07	−2.91	(−.34, −.06)

Unstandardized estimates are reported. CI limits = lower and upper 95% confidence interval

*$p < .05$

**$p < .01$

***$p < .001$

NOTE: PERFORMANCE: LOW VALUE= HIGH

students' popularity (i.e., indegree centrality) in their peer network at the very end of the introductory course mediated the relationship between their extraversion (without agreeableness as a moderating variable) and their performance (i.e., GPA) at the end of the entire degree program.

-> 2 students who differ from each other in one unit on extraversion differ in (−).08 units on their GPA

MAIN LIMIT

the cohort is characterized by a relative small cohort size and an unequal gender distribution even though this is representative for psychology study programs. Therefore, generalizations to other study programs should be made with caution.

Integrating Personality and Social Networks:
A Meta-Analysis of Personality, Network Position,
and Work Outcomes in Organizations

Ruolian Fang

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How Does Personality Relate to Network Position?

- indegree centrality : the number of incoming ties an individual receives from others

- Brokerage: the extent to which an individual is connected to people or clusters of people who are not connected (BETWEEN CENTRALITY/STRUCTURAL HOLES)

Conscientiousness

Dependability

Grit

Organization

Persistence

Planning

Punctuality

Responsibility

Agreeableness

Collaboration

Collegiality

Generosity

Honesty

Integrity

Kindness

Trustworthiness

Big Five

Extraversion

Assertiveness

Cheerfulness

Communication

Optimism

Leadership

Liveliness

Sociability

Emotional Stability

Confidence

Coping with Stress

Moderation

Resilience

Self-Esteem

Self-Consciousness

Self-Regulation

Openness to Experience

Curiosity

Creativity

Global Awareness

Growth Mindset

Imagination

Innovation

Tolerance

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Self-monitoring

From Wikipedia, the free encyclopedia

This article is about the theory. For recording of one's own activities, see Quantified Self.

Self-monitoring is a concept introduced during the 1970s by Mark Snyder, that shows how much people monitor their self-presentations, expressive behavior, and nonverbal affective displays.[1] Human beings generally differ in substantial ways in their abilities and desires to engage in expressive controls (see dramaturgy).[2] It is defined as a personality trait that refers to an ability to regulate behavior to accommodate social situations. People concerned with their expressive self-presentation (see impression management) tend to closely monitor their audience in order to ensure appropriate or desired public appearances.[3] Self-monitors try to understand how individuals and groups will perceive their actions. Some personality types commonly act spontaneously (low self-monitors) and others are more apt to purposely control and consciously adjust their behavior (high self-monitors).[4] Recent studies suggest that a distinction should be made between acquisitive and protective self-monitoring due to their different interactions with metatraits.[5] This differentiates the motive behind self-monitoring behaviours: for the purpose of acquiring appraisal from others (acquisitive) or protecting oneself from social disapproval (protective).

How Does Personality Relate to Network Position?

■SELF-MONITORING

-> high monitors regulate and control how they present themselves in social settings and interpersonal relationships

-> generate affective states and behaviors appropriate to specific situations

How Does Personality Relate to Network Position?

HIGH SELF- MONITORING people

recipients of incoming friendship ties (Sasovova et al. 2010)

indegree centrality
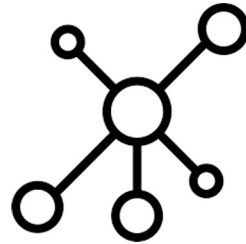
segregate their contacts from each other

brokerage

SELF-MONITORING

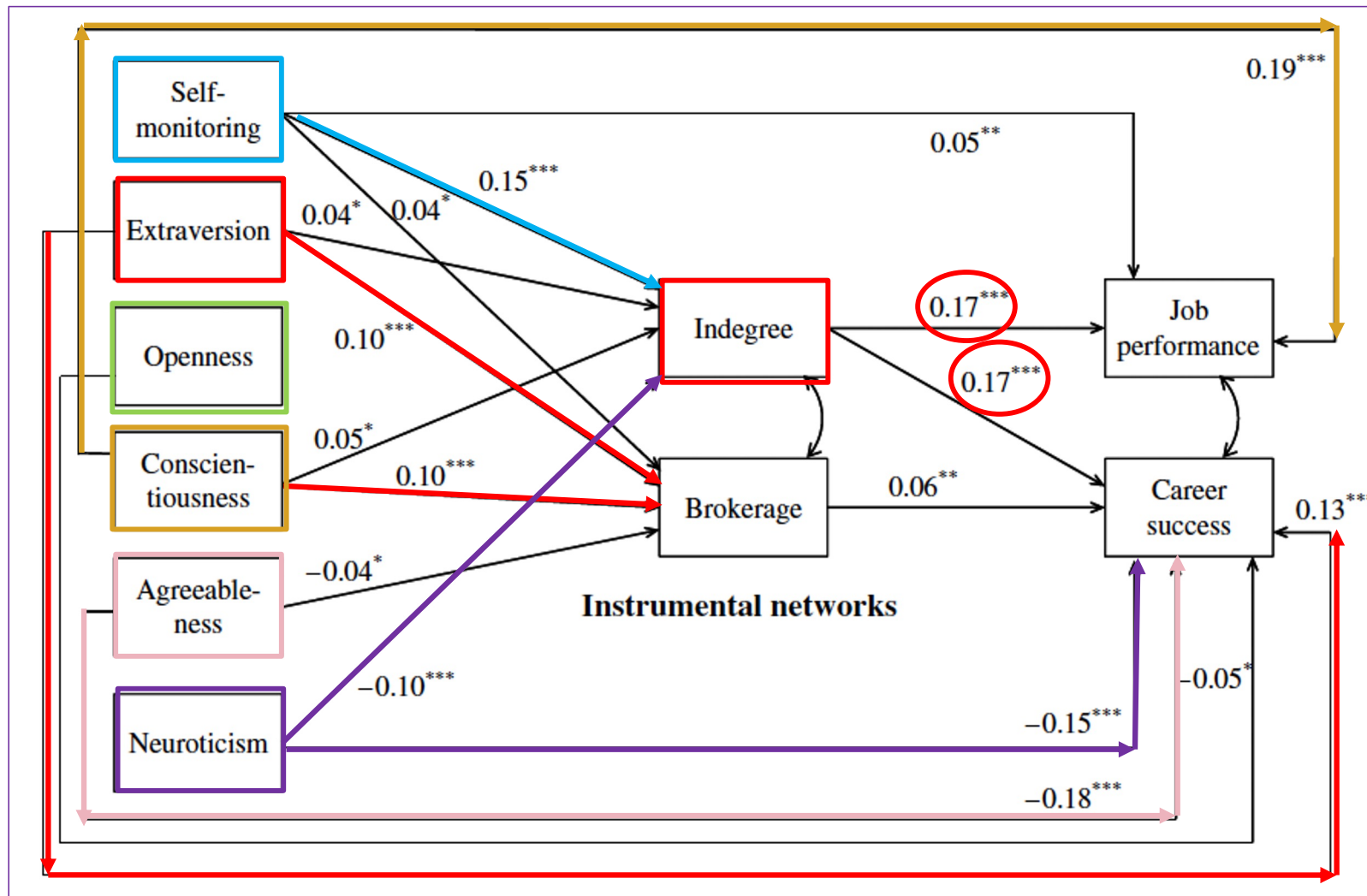BIG FIVE

INDEGREE CENTRALITY

BROKERAGE

PERFORMANCE

EXPRESSIVE NTW

INSTRUMENTAL NTW
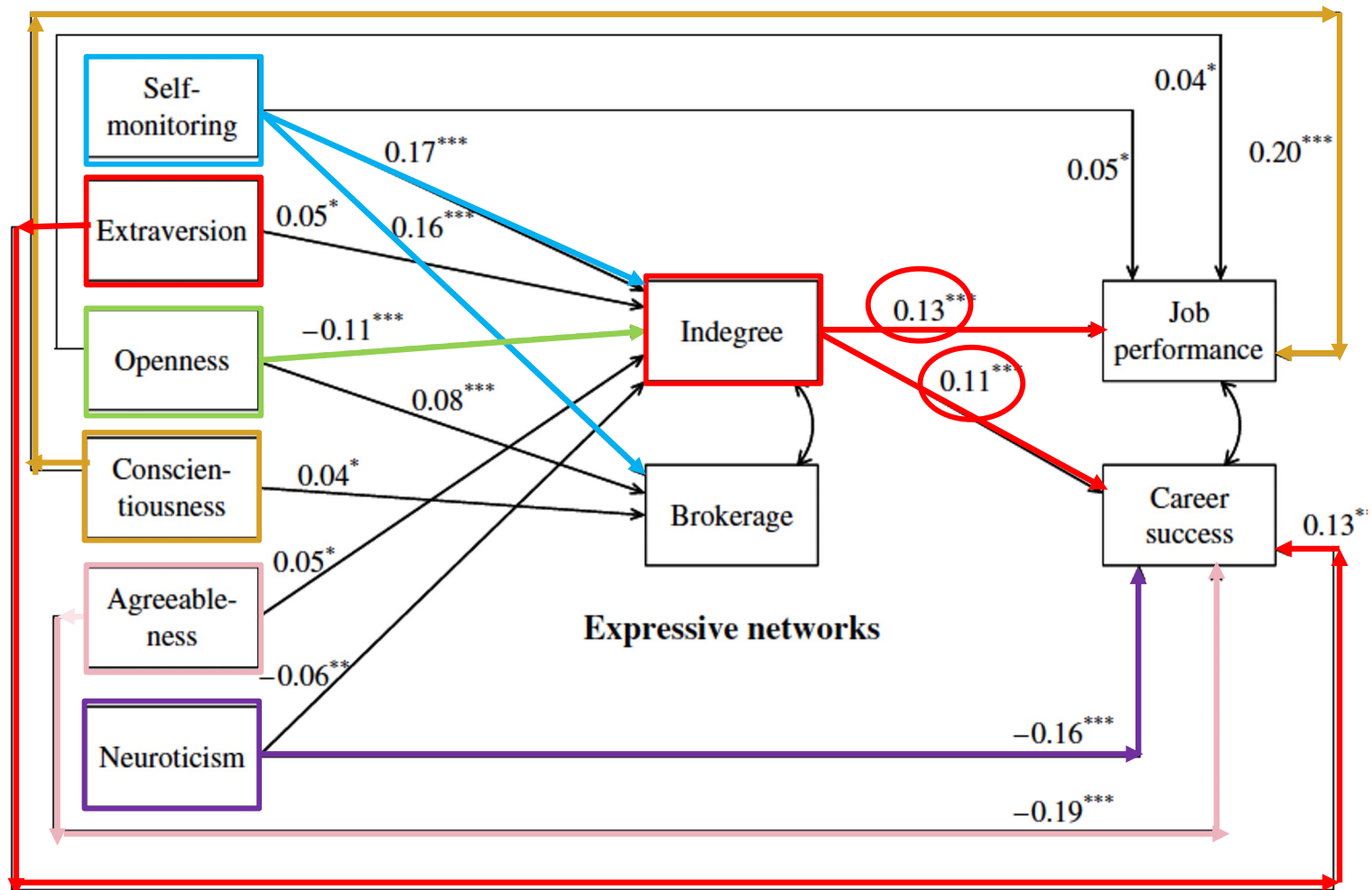
Meta-analysis

- 138 independent samples
- MS identifies through PsychInfo, ABI/Inform, Web of Science

- KEYWORDS:
  - *PERSONALITY: "personality" "traits" "individual differences," "self-monitoring," "five-factor model traits," "Big Five," "extraversion," "agreeableness," "conscientiousness," "neuroticism," "openness to experience"*
  - *NETWORK: "centrality," "degree," "indegree," "brokerage,""betweenness," "constraint" «social network»*
  - *PERFORMANCE:"job performance," "task performance,""in-role performance," "achievement," "career success,""promotion," "compensation," "bonus," "salary"*

Meta-Analytic Path Model for Personality, **Instrumental** Network Position, and Work Outcomes

Self-monitoring

Extraversion

Openness

Conscien-tiousness

Agreeable-ness

Neuroticism

Indegree

Brokerage

Instrumental networks

Job performance

Career success

0.19***

0.05**

0.15***

0.04*   0.04*

0.10***

0.05*

0.10***

−0.04*

−0.10***

0.17***

0.17***

0.06**

0.13**

−0.05*

−0.15***

−0.18***

Meta-Analytic Path Model for Personality, **<u>Expressive</u>** Network Position, and Work Outcomes

Questions ?