



# **Understanding the Acceptance and Usage of Project Management Methodologies**

## **Results of an international cross-sectional study**

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# Disclaimer

- ▶ The preliminary results presented in this research report are a part of an ongoing research project. In some cases the analysis is based upon a subset of the total sample.
- ▶ While the results are relatively stable, further developments and discoveries during the course of the project might lead to corrections and, consequently, changes in recommendations and implications.
- ▶ Due to the rigorous nature of scientific research such projects generally last a few years; the final results are expected to be released and published over the course of the next 3 years.
- ▶ The information provided in this report is only intended to be general summary information and may be used freely if appropriately referenced.
- ▶ It is not the authors' intention to provide binding advice to the readers of this report. Instead, we provide the readers with information to help them better understand the topic at hand.
- ▶ The authors do not sell, or disclose the participants' names, addresses, email addresses or other personal information. Participants enjoy full anonymity unless otherwise specified by them.

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## Employees often do not use project management methodologies as expected/required by their organization

- ▶ Despite the advantages of using a project management methodology (PMM) (e.g. PRINCE2, PMBook etc.), studies have repeatedly shown that organizations are unable to motivate their staff (e.g. project managers, team members, etc.) to use such methodologies appropriately.
- ▶ Even when employees use these methodologies, the question regarding the nature of their use remains. I.e. are they using PPMs in a dedicated manner, or just using them superficially?
- ▶ This issue is important because using PPMs alone does not ensure sustained productivity gains. A critical aspect is **the way** an employee uses the PPM, and it determines the impact the methodology will have on the project's success.
- ▶ Our research therefore aims at i) uncovering the different ways employees use PMMs, and ii) factors that foster or hinder these usage behaviors.
- ▶ Each of the determinants we discover reveals a different aspect of human behaviour and personality, and each can serve as a point of influence for management in their attempts to steer employee behaviour in the desired direction.

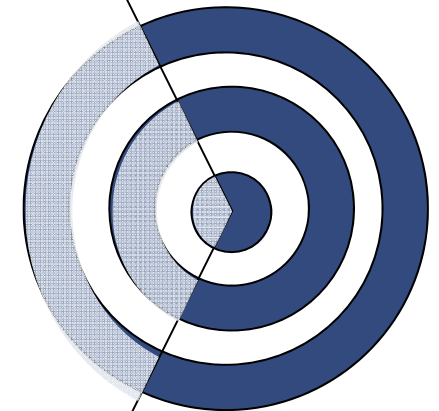


**Knowledge of the various usage behaviors and their determinants might help organizations manage the selection, development, introduction, adoption, and use of new PMMs.**

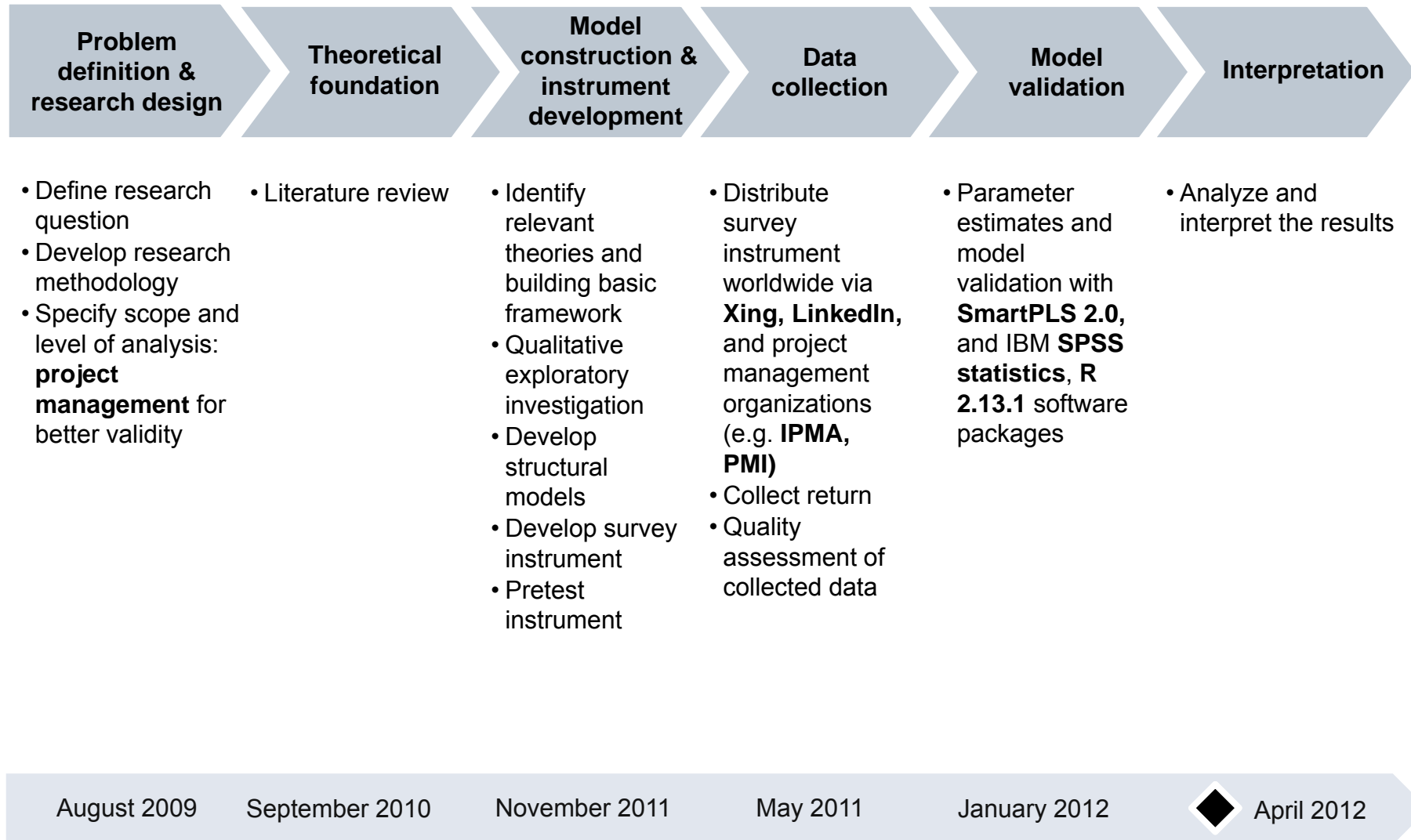
## Our research attempts to understand PMM usage behavior of employees in a holistic manner

### Research Questions (RQ)

- ▶ RQ1: Which types of project management methodology usage behaviors exist?
- ▶ RQ2: What are the determinants of the various usage behaviors?



## Our rigorous methodology ensures that the attained results satisfy the highest levels of scientific validity and reliability quality criteria



## Model and survey instrument development is done iteratively using multiple methods and data sources

### Model construction

- ▶ Based on existing theories from the domain of sociology, psychology, and economics, we conceptualize the different types of PMM usage behaviors and develop conceptual models hypothesizing how various variables interact to influence the PMM usage behaviors.
- ▶ We also conducted an exploratory investigation by assisting a large multinational professional service firm (140,000+ employees) in its endeavour to develop a new PMM. Data from interviews and workshops is used to further refine the models.


### Survey instrument development

- ▶ The online web-based survey instrument is developed over a period of four months.
- ▶ We derived an initial list of items (i.e. questions) based upon existing literature and our exploratory investigation.
- ▶ We conducted expert interviews to identify further relevant questions.
- ▶ We conducted a Q-Sorting exercise in two rounds with 7 and 8 participants respectively to refine the questions.
- ▶ We conducted a web-based pre-test of the survey instrument with 65 participants to ensure the final instrument was highly valid and reliable.

**The models capture the most important variables from different perspectives and the survey instrument is suitable for measuring these variables.**

## Our research shows that employees use project management methodologies either in a committed, compliant, or resistant manner

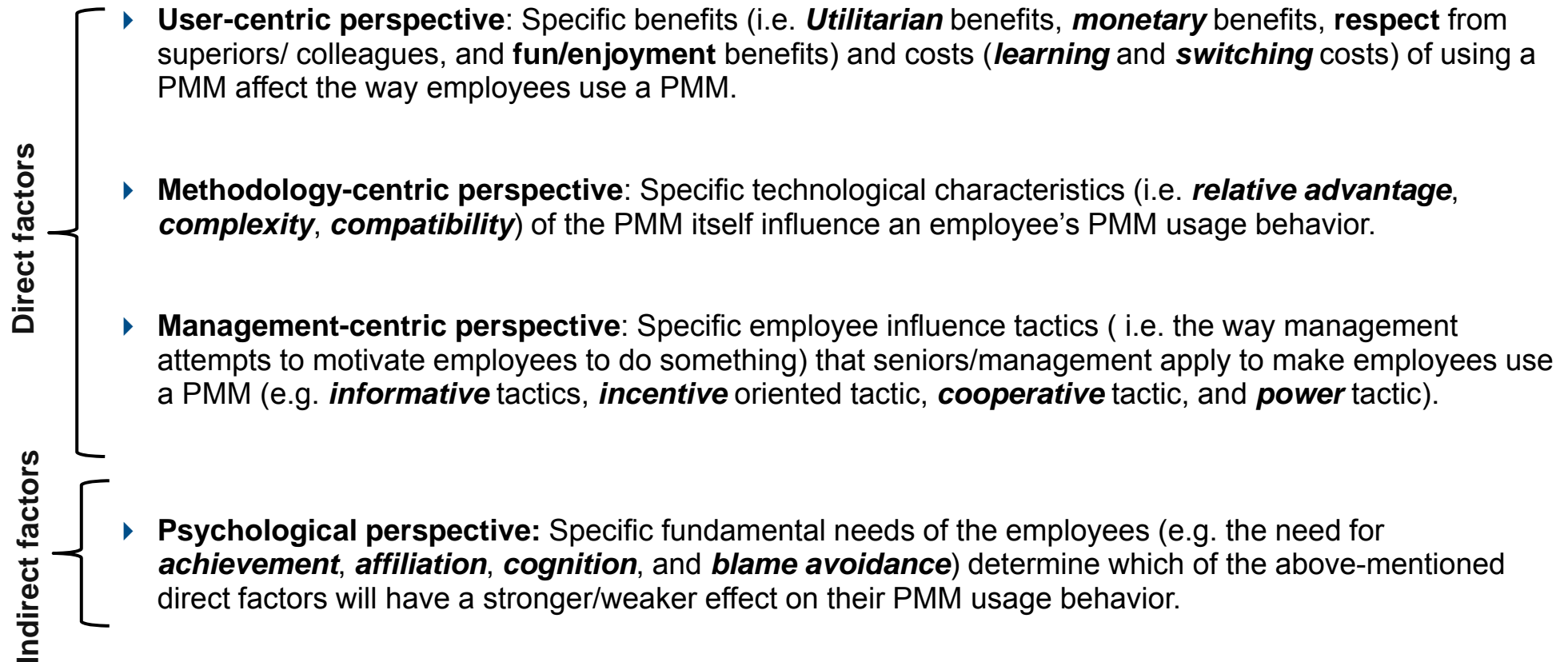
- ▶ We find that employees use PMMs in three different ways:
  - ▶ **Committed use:** occurs when an employee agrees internally to using the PMM, is enthusiastic about it, and is likely to exercise initiative and demonstrate unusual effort and persistence in order to carry out the necessary actions to use the PMM in the best possible manner.
  - ▶ **Compliant use:** occurs when the employee uses a PMM but is apathetic about it rather than enthusiastic, makes only a minimal or average effort, and does not show any initiative. A person's primary interest is to obtain rewards or avoid punishment and his or her PMM usage behavior reflects actions that enable him to achieve these goals without any intrinsic involvement.
  - ▶ **Resistant use:** takes place when an individual is consciously or subconsciously opposed to using the PMM due to potential social, economical, or emotional disadvantages. The person tries to avoid using the PMM actively or passively, and overtly or covertly, for example by refusing, sabotaging, bad mouthing, arguing, or delaying its implementation, or seeking to have the request/order to use the PMM nullified.
- ▶ These usage behaviors are generally not directly identifiable by management (employees fear sanctions from superiors and hide their true feelings, attitudes, and behavior). On the surface employees might show commitment, but use the PMM in a compliant or resistant manner when executing a project.



**Better understanding of this hidden, intransparent nature of how employees are actually using PMMs can help ensure a more productive and effective application of PMMs in projects.**



## We adopt a multi-dimensional approach to identify factors that influence the three PMM usage behaviors



Each of these factors has either a positive or negative, a direct or indirect impact on an employee's PMM usage behavior.

## Data is collected from PM professionals working in different industries throughout the world

- ▶ Data was collected via a i) personalized, ii) anonymous online survey.
- ▶ The personalized survey URL was sent to a total of 7,982 individuals selected randomly by utilizing databases of professionals (e.g. XING, Viadeo, LinkedIn), of whom 1,249 completed the survey.
- ▶ 1,408 individuals responded anonymously primarily as a result of PM organizations sending their members a link of the survey.
- ▶ Total number of participants reached **2651**, making this research one of the **largest** international studies in the PPM domain.
- ▶ Participants are mostly project managers, generally between 30 - 50 years old, mostly males, and have some sort of project management certification (64%).
  - ▶ Among the 64% people having a project management certification, 45% are certified as PMP, and 4% as PRINCE2 Practitioners.

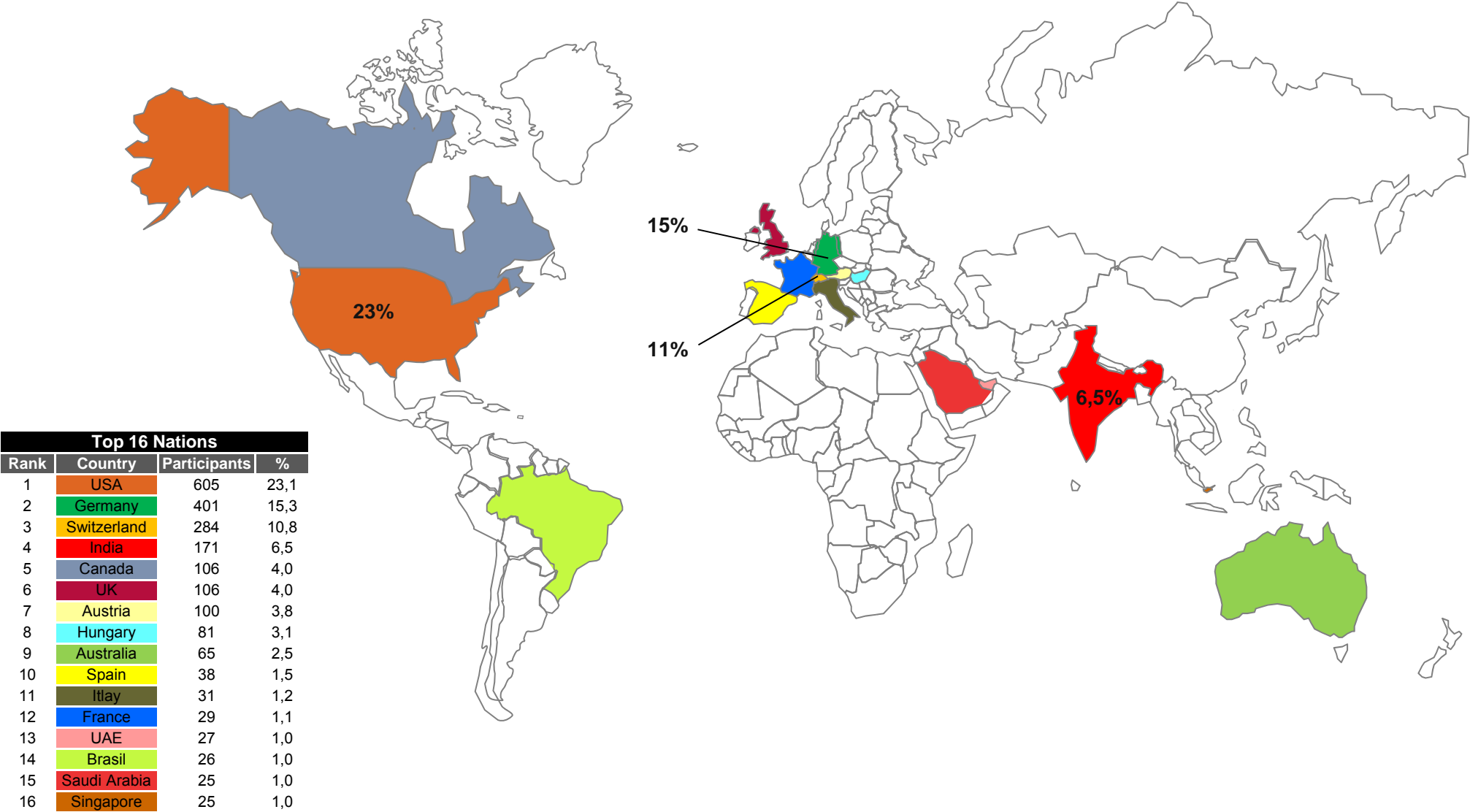
Primary role in the project		
	Frequency	%
Project manager	1837	69
Project team member	284	11
Project sponsor	38	1
Controlling	20	1
Program manager	262	10
Portfolio manager	54	2
Member of a project office / competence center project management	116	4
Other	40	2
<b>Total</b>	<b>2651</b>	<b>100</b>

Gender		
	Frequency	%
Male	2136	81
Female	515	19
<b>Total</b>	<b>2651</b>	<b>100</b>

Project manager certification		
	Frequency	%
Yes	1707	64
No	917	35
Not specified	27	1
<b>Total</b>	<b>2651</b>	<b>100</b>

Age (years)		
	Frequency	%
less than 20	1	0.0
20 - 30	201	8
30 - 40	1025	39
40 - 50	938	35
50 - 60	399	15
more than 60	75	3
Not specified	12	1
<b>Total</b>	<b>2651</b>	<b>100</b>

Participants (n = 2615) originate from 126 different countries and work primarily in USA, Germany, Switzerland, and India



## Contrary to popular belief, not all benefits (costs) have a positive (negative) effect on PMM usage behavior


User-centric Findings	Managerial implications and recommendations
<ul style="list-style-type: none"> <li>Individuals use PMMs in a committed manner if they feel that doing so will make them more productive, get them respect from colleagues, and if using the PMM will be fun/enjoyable.</li> </ul>	<ul style="list-style-type: none"> <li><b>Make the PMM useful to people.</b> Include accustomed and established work practices as much as possible (follow a participatory design approach). Focus on individuals instead of focusing solely on organizational impact.</li> <li>Cultivate a culture of <b>open feedback</b>, where deserving employees who make an extra effort to use a PMM rigorously are praised, appreciated, or given some form of <b>symbolic award</b> at official events or meetings.</li> <li><b>Make the PMM fun to apply.</b> Design the PMM to support experimentation and piloting. Enable exploration, and professional self-actualization, e.g. by giving varying degrees of freedom to the users.</li> </ul>
<ul style="list-style-type: none"> <li>Extrinsic materialistic benefits reduce committed usage of PMMs.</li> </ul>	<ul style="list-style-type: none"> <li><b>Refrain from using materialistic rewards</b> (e.g. bonus, certifications) as sole motivator because people might attempt to exploit this and do the bare minimum to acquire the rewards, showing only superficial commitment.</li> </ul>
<ul style="list-style-type: none"> <li>Costs related to learning a PMM reduce committed usage.</li> </ul>	<ul style="list-style-type: none"> <li><b>Make the PMM lean, flexible, and easy to use</b> by providing the user with adequate personal and software support. This will reduce unnecessary cognitive tension and boost confidence of the people in their ability to easily learn and use the PMM.</li> </ul>
<ul style="list-style-type: none"> <li>The negative effect of learning costs on committed usage is weaker for people with a high <i>need for achievement</i> (nAch) and <i>cognition</i> (nCog).</li> </ul>	<ul style="list-style-type: none"> <li><b>Assign individuals high in nAch and nCog to large projects</b>, since complex and bulky methodologies used in large projects are better suited to them, providing them with a higher degree of intellectual stimulation and challenge.</li> </ul>
<ul style="list-style-type: none"> <li>Sunk costs help to foster committed usage.</li> <li>But the positive effect of sunk costs on committed usage is weaker for people with a high <i>need for cognition</i>.</li> </ul>	<ul style="list-style-type: none"> <li><b>Consider investing heavily in educating and training employees</b> in a PMM, especially prior to its implementation, because after employees reflect on the time and effort they have invested to learn and master the methodology, they might feel more committed to using it.</li> </ul>

## PPMs not compatible with the user's beliefs and habits will evoke a high degree of resistance

### Methodology-centric Findings

- PMM characteristics such as *relative advantage* and *compatibility* reduce resistant usage.
  - *Compatibility* is the most effective factor in reducing resistant use of a PMM.
- 
- The resistance reducing effect of relative advantage is weaker for people with a high *need for achievement* (nAch) because individuals with a high nAch are driven by their desire to have their success attributed to their skills and competencies, rather than characteristics of the PMM.
- 
- The more *complex* a PMM is, the higher is its resistant usage.
  - The resistance increasing effect of complexity is weaker for people with a high *need for achievement* and *cognition* (nCog).

### Managerial implications and recommendations

- **Focus on PMM compatibility first.** Making a methodology compatible with its users' beliefs and habits should be the prime concern during the early stages of introduction/implementation, even if its usefulness has to be compromised (e.g. have less features). Once the employees have become accustomed to the new methodology, management can successively improve the methodology's relative usefulness by means of small upgrades. When change is implemented in small steps, it is most likely met with less resistance. Employees will be much more inclined to use a new PMM if their perception of compatibility is not fundamentally challenged.
- **Give people credit for success and not the methodology.** Especially those people with a high nAch aspire to accomplish difficult tasks in which success depends primarily on their efforts. Such individuals are most satisfied when they know that they alone are responsible for a successful outcome. Putting the PMM in the spotlight generates the impression that anyone can be successful if they use that particular PMM. Therefore, psychologically, high achievers are dismayed by the notion that, even after putting in all the hard work, they might not get credit for their success. 
- **Involve individuals high in nCog in the development of a complex PMM .** Individuals with high nCog are perfect candidates in the development phase of a PMM since they are more likely to enjoy examining a complex PMM, finding the task intellectually stimulating, and therefore to provide effective improvement feedback.
- **Let individuals high in nAch manage highly complex projects.** Individuals with a high nAch are expected to put more effort into tasks, persevere longer when confronted with obstacles, and show resilience in the face of complex methodology use.

## Behavior influencing tactics are most effective when they take into consideration the target employee's personality characteristics

### Management-centric Findings

- *Monetary incentive oriented, information oriented, and cooperative* user influence tactics (UIT) reduce resistant usage.
- The resistance reducing influence of *information* providing *UIT* is stronger for people with a high *need for achievement*.

- *Power-coercive UIT* increases resistant usage.
- The positive effect of *power-coercive UIT* on resistant use is weaker for people with a high *need for affiliation, blame avoidance, and achievement*.

### Managerial implications and recommendations

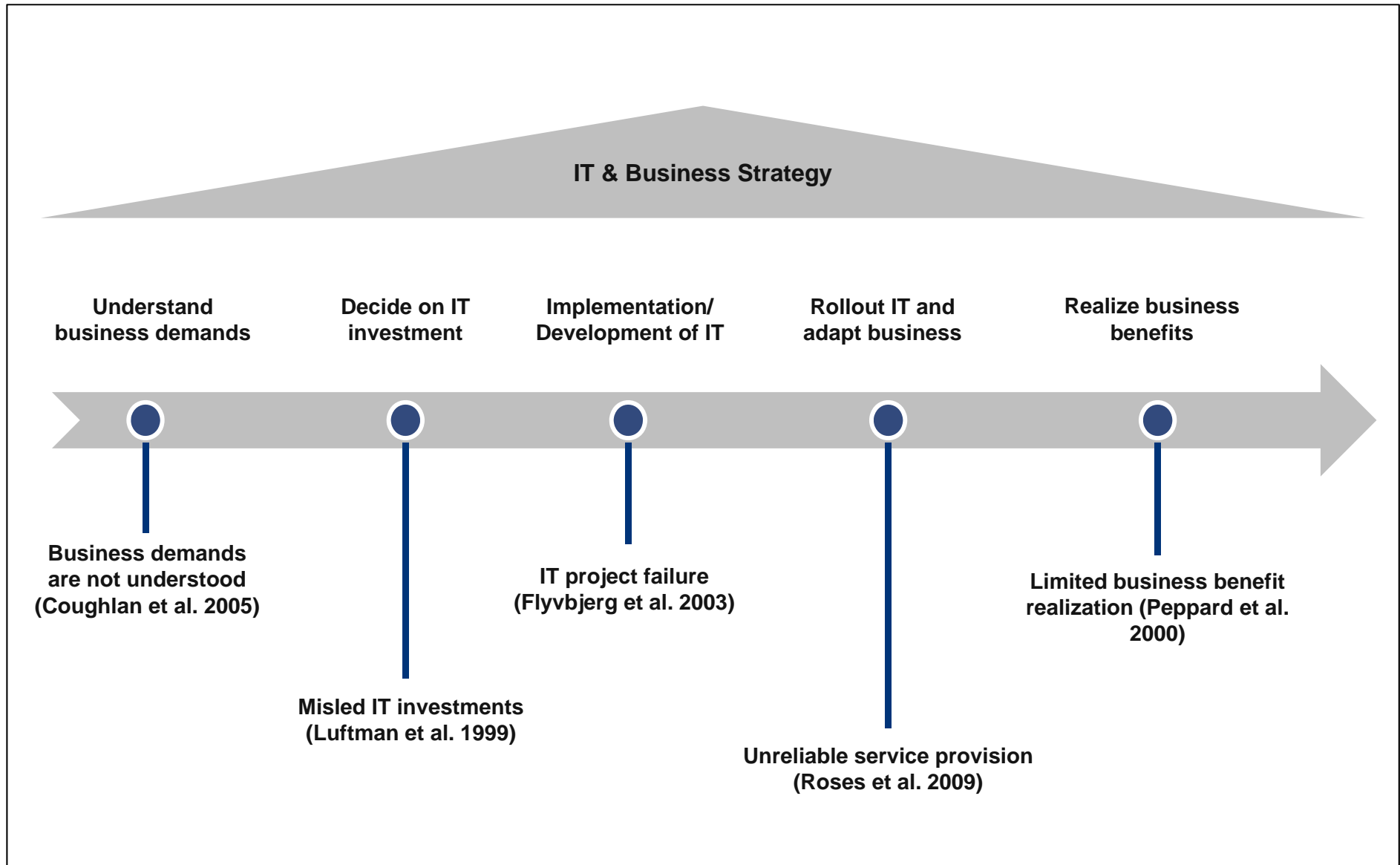
- **Educate PMM users on the instrumental value of the PMM.** Focus on convincing employees of the productivity enhancing benefits of the PMM, not simply through hollow speeches, but rather using facts and referring to subject matter experts (e.g. scientists, consultants, publications etc.).
  - **Avoid financial motivators.** An incentive-oriented UIT that only provides monetary benefits and incentives in the hope that employees will use a methodology in a committed manner might be perceived as “bribery”. Particularly individuals with a sense of moral or social responsibility might revolt against the management's notion that they can “buy” their employees' trust, faithfulness, and dedication.
  - **Involve employees in the development and implementation of the PMM:** Cooperative managerial strategy which includes the employees in the methodology selection and development process reduces resistant usage.
- 
- **Use power tactics very selectively on specific types of individuals.** Although the use of power and pressure to force employees to use PMMs might make people use the methodology, this usage might be of a resistant, counterproductive, and destructive nature.
  - However, individuals high in nAch, in particular males, are more willing to submit to managerial demands in order to be viewed more favorably by superiors and acquire scarce resources that are critical for their work success.
  - A similar effect can be noticed in employees with a strong need to avoid being blamed for mistakes, as well as those who want to be liked by others and have deep interpersonal relationships with them.
  - If called for, superiors should use pressure and power only on those employees who have a strong need for achievement, affiliation, and blame avoidance. Use of authority and pressure to influence the usage behavior of employees low in the above-mentioned needs might backfire and cause them to become highly resistant and counterproductive.



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## Realizing business value though IT often fails





## To reduce the risk of project failure, best practices are replicated by applying project management methodologies

- ▶ A project management methodology is a collection of goal-oriented, problem-solving techniques governed by a multi-step procedure that prescribes what to do and how to do things (Avison and Fitzgerald 2003).

### Advantages of using methodologies (Fitzgerald 1998)

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- ▶ They reduce complexity by subdividing an undertaking into plausible and coherent steps.
- ▶ They increase transparency and control, thus reducing risk and uncertainty.
- ▶ They provide a goal-oriented framework.

## Problem: Enterprises invest heavily in project management methodologies that have very limited impact

### Large investments

- Large investments are made into methodologies (Livari et. al. 2000).
- Cost drivers: Development effort, software tools, introduction, and training.
- Example (from an explorative investigation): a large professional services firm invested app. €500,000 in PMM development and introduction.



### Limited impact

- Only 50% of organizations can enforce the use of such methodologies among their staff (Glass 1999).
- Only 6% of organizations claim that their methodologies are always used as specified (Russo et al. 1996).
- Only 17% of users, in a survey of 152 organizations, claimed to use a methodology in its entirety (Eva and Guilford 1996).

**We need a better understanding of employee behavior regarding the use of PMMs.**

## Prior research draws mainly on the theory of planned behavior (TPB) and technology acceptance model (TAM)

### Sociological models

- ▶ Focus on **intention to use** as the dependent variable measured through self-reported quantitative measures (Johnson et al. 1999; Riemenschneider et al. 2002; Hardgrave et al. 2003).
- ▶ Roberts et al. (1998) identified a number of factors, based on an exploratory factor analysis (EFA) of 88 survey items.
- ▶ Kautz and Heje (1999) conducted explorative studies to find a positive effect of formal university **education** on the adoption of methodologies.
- ▶ Johnson et al. (1999) applied TPB to examine the beliefs that underlie **attitudes**, **social norms**, and **behavioral control** constructs.
- ▶ Hardgrave and Johnson (2003) found that **organizational usefulness**, **subjective norm**, and **perceived behavioral control-internal** significantly influenced users' intentions.
- ▶ People use methodologies to complete deliverables and as insurance to **deny responsibility** in case of project failure (Westrup 1983).

### Technological models

- ▶ Use the diffusion of innovation theory (Roger 2005) to derive technological characteristic-oriented determinants.
- ▶ Riemenschneider et al. (2002) tested five theoretical models and found that
  - **perceived usefulness** was the only significant variable across all five models;
  - **voluntariness** was found not significant (or was not included) in three models;
  - **compatibility** was found not significant (or was not included) in four models; and
  - **result demonstrability**, **complexity**, **observability**, and **image** were found to be not significant (or were not included) across all five models.
- ▶ Hardgrave et al. (2003) studied users' intentions to use methodologies, and found **usefulness** to be significant (although comparatively weaker), **complexity** to not be significant, and **voluntariness** and **compatibility** to be significant but weak.

**Usefulness or relative advantage** emerges as the single most important factor in both sociological as well as technological models.

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## The current research attempts to understand methodology usage behavior of employees focusing on two specific research gaps

### Research gaps (RG)

#### RG1: Nature of use neglected

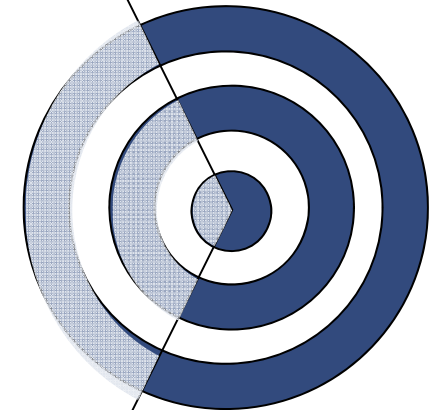
- ▶ Use behavior has generally been studied as “intention” operationalized in terms of time duration and frequency (Lee et al. 2003).
- ▶ Researchers should also consider the *nature*, and the *quality* of use (DeLone and McLean 2003).

#### RG2: Determinants focus only on user-centric cognitive decision-making

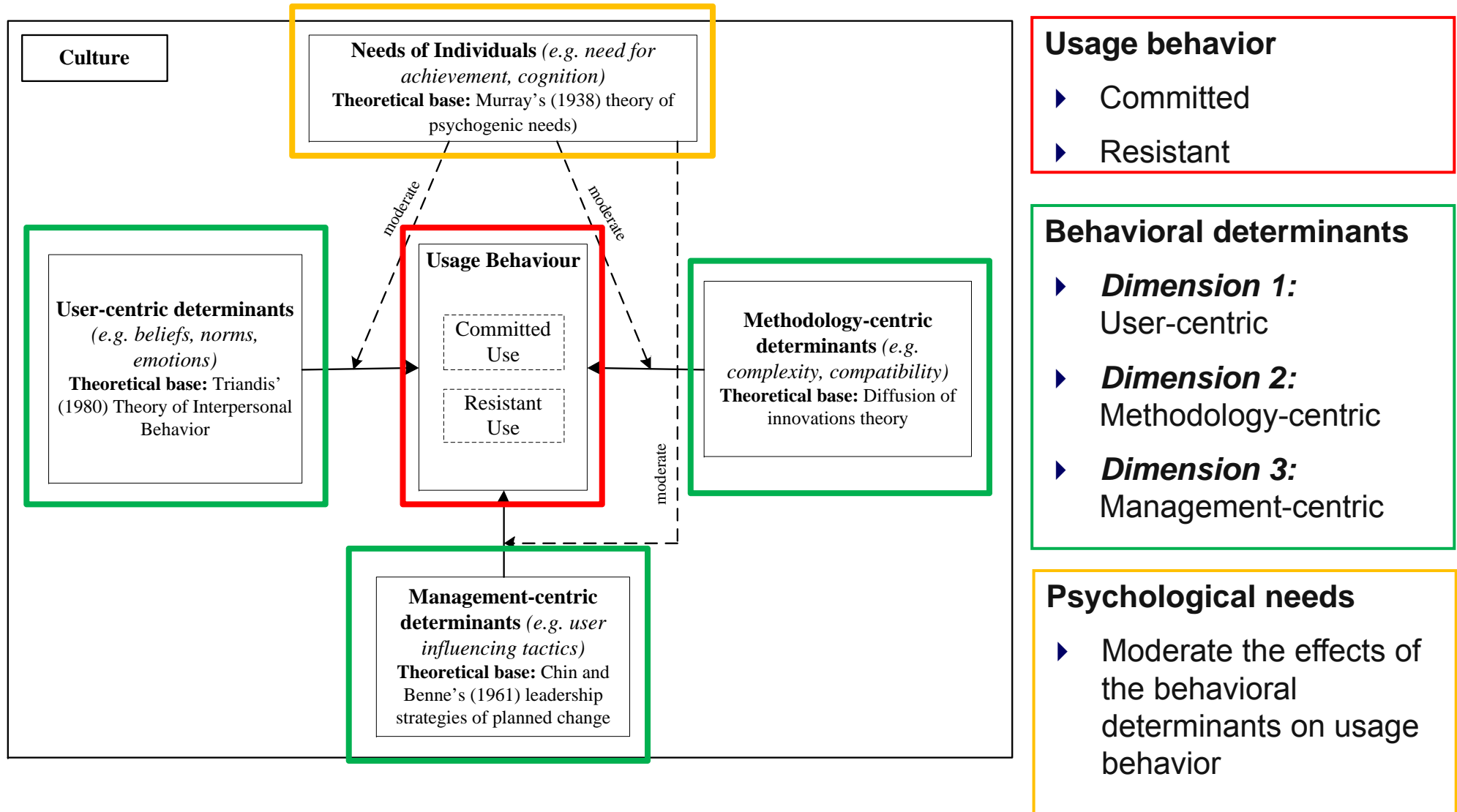
- ▶ Prior research has focused on cognitive processes underlying the adoption and use decision.
- ▶ Research has not attempted to examine the effect of non-cognitive factors such as psychological human needs.

### Research Questions (RQ)

- ▶ RQ1: Which types of project management methodology usage behaviors exist?
- ▶ RQ2: What are the determinants of the usage behaviors?



## Multidimensional research framework addressing the research gaps identified



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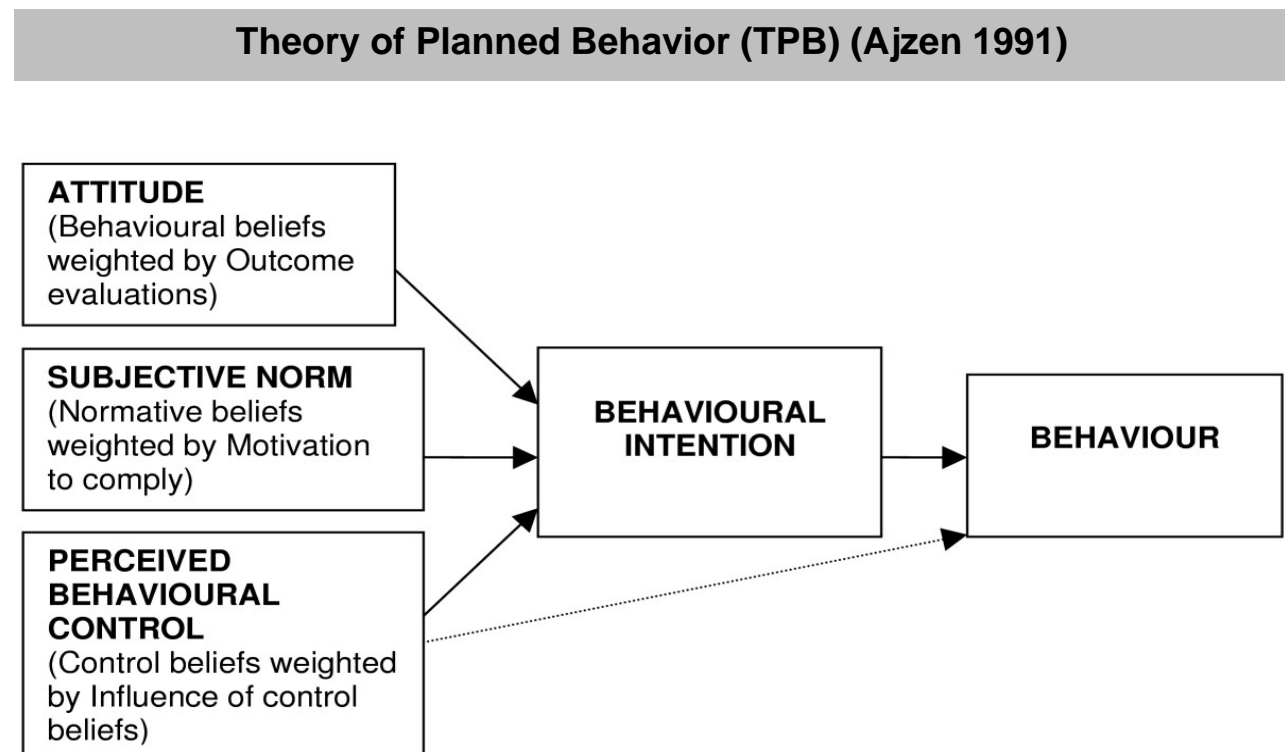
## Behavioral science theories in sociology & psychology are used as a scientific basis for understanding antecedents of methodology adoption and use

- **Persuasion theories** such as the *Theory of Planned Behavior* (Ajzen 1991) and *Triandis' Theory of Interpersonal Behavior* (Triandis 1980) provide the theoretical basis for examining the relations among beliefs, attitudes, behavioral intentions, and behaviors of individuals regarding the use of IS methodologies.
- **Needs theories** such as *Maslow's Hierarchy of Needs Theory* (Maslow 1954) and *Murray's Theory of Psychogenic Needs* (Murray 1938) imply that individuals are motivated to use a particular methodology by their individual desire to satisfy certain needs.



## Persuasion theories I: Use of methodologies is preceded by the intention to do so, and intention is, in turn, influenced by specific beliefs

- **Attitude toward behavior:** an individual's positive or negative evaluation of self-performance of the particular behaviour.
- **Subjective norm:** an individual's perception of social normative pressures, or the relevant beliefs of others that he or she should or should not perform such behaviour.
- **Perceived behavioral control:** the perceived ease or difficulty with which an individual performs a particular behaviour.
- **Behavioral intention:** an indication of an individual's readiness to perform a given behaviour.

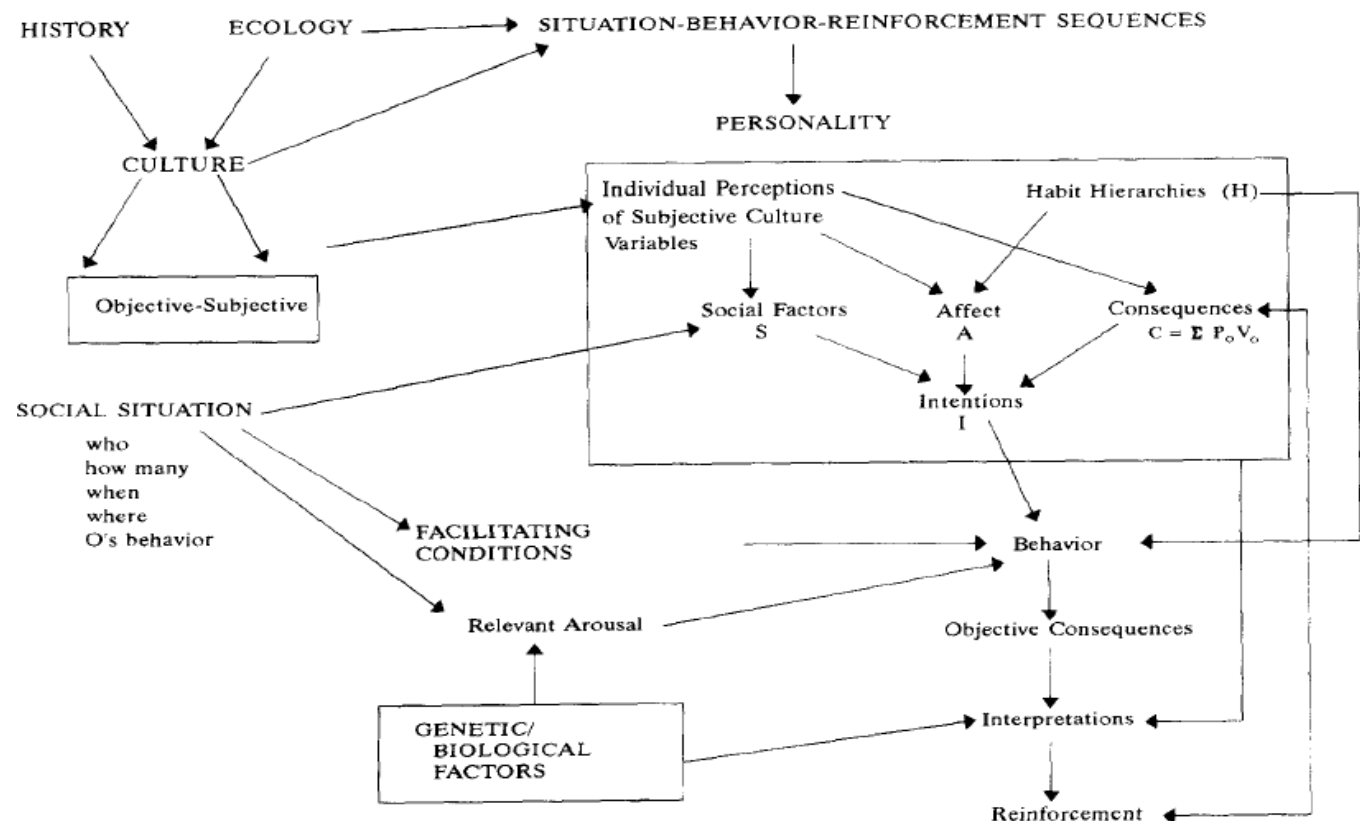


## Persuasion theories II: Triandis' Theory of Interpersonal Behavior is a more holistic approach compared to the Theory of Planned Behavior

### Triandis' Theory of Interpersonal Behavior (Triandis 1980)

#### Additional Variables:

- Affect: Habits, Emotions
- Culture
- Personality
- Behavioral Reinforcement



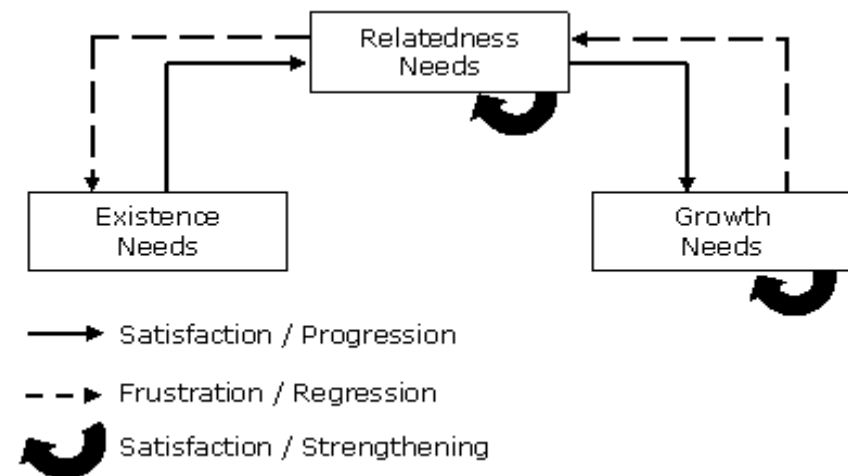
## Needs theories I: Needs theories imply that individuals are motivated to use a particular methodology because of their desire to satisfy certain fundamental needs

### Maslow's hierarchy of needs theory



- The pyramid illustrates the five levels of human needs with the largest and lowest levels of needs at the bottom, and the need for self-actualization at the top.
- According to the theory there exists a hierarchy of needs, and that certain lower needs have to be satisfied in order for higher needs to be recognized as unfulfilled.
- The theory also states that only one need will be pursued at a given time.

### Existence, Relatedness, and Growth (ERG) Theory



- **ERG theory recognizes that the order of importance of the three categories may vary for each individual.**
  - More than one need may motivate at the same time.
  - The importance of needs can differ for different people.

## Needs theories II: Murray's psychogenic needs: A list of 27 fundamental human needs

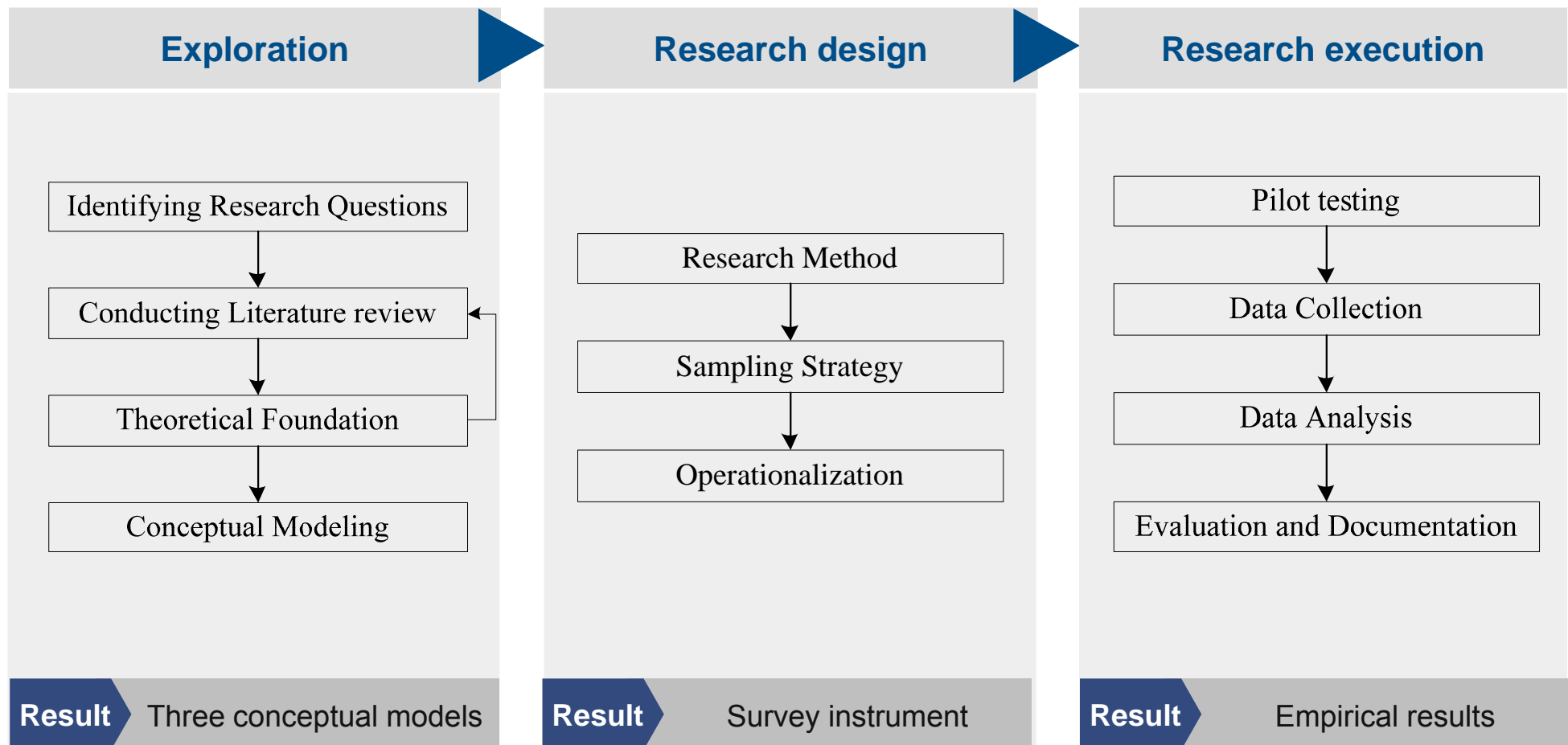
Need	Definition
Abasement	To surrender and submit to others, accept blame and punishment. To enjoy pain and misfortune.
Achievement	To accomplish difficult tasks, overcoming obstacles and becoming expert.
Affiliation	To be close and loyal to another person, pleasing them and winning their friendship and attention.
Aggression	To forcefully overcome an opponent, controlling, taking revenge or punishing them.
Autonomy	To break free from constraints, resisting coercion and dominating authority. To be irresponsible and independent.
Counteraction	To make up for failure by trying again, seeking pridefully to overcome obstacles.
Defendance	To defend oneself against attack or blame, hiding any failure of the self.
Deference	To admire a superior person, praising them and yielding to them and following their rules.
Dominance	To control one's environment, controlling other people through command or subtle persuasion.
Exhibition	To impress others through one's actions and words, even if these are shocking.
Harm avoidance	To escape or avoid pain, injury and death.
Infavoidance	To avoid being humiliated or embarrassed.
Nurturance	To help the helpless, feeding them and keeping them from danger.
Order	To make things clean, neat and tidy.
Play	To have fun, laugh and relax, enjoying oneself.
Rejection	To separate oneself from a negatively viewed object or person, excluding or abandoning it.
Sentience	To seek out and enjoy sensual experiences.
Sex	To form relationships that lead to sexual intercourse.
Succourance	To have one's needs satisfied by someone or something. Includes being loved, nursed, helped, forgiven and consoled.
Understanding	To be curious, ask questions and find answers.

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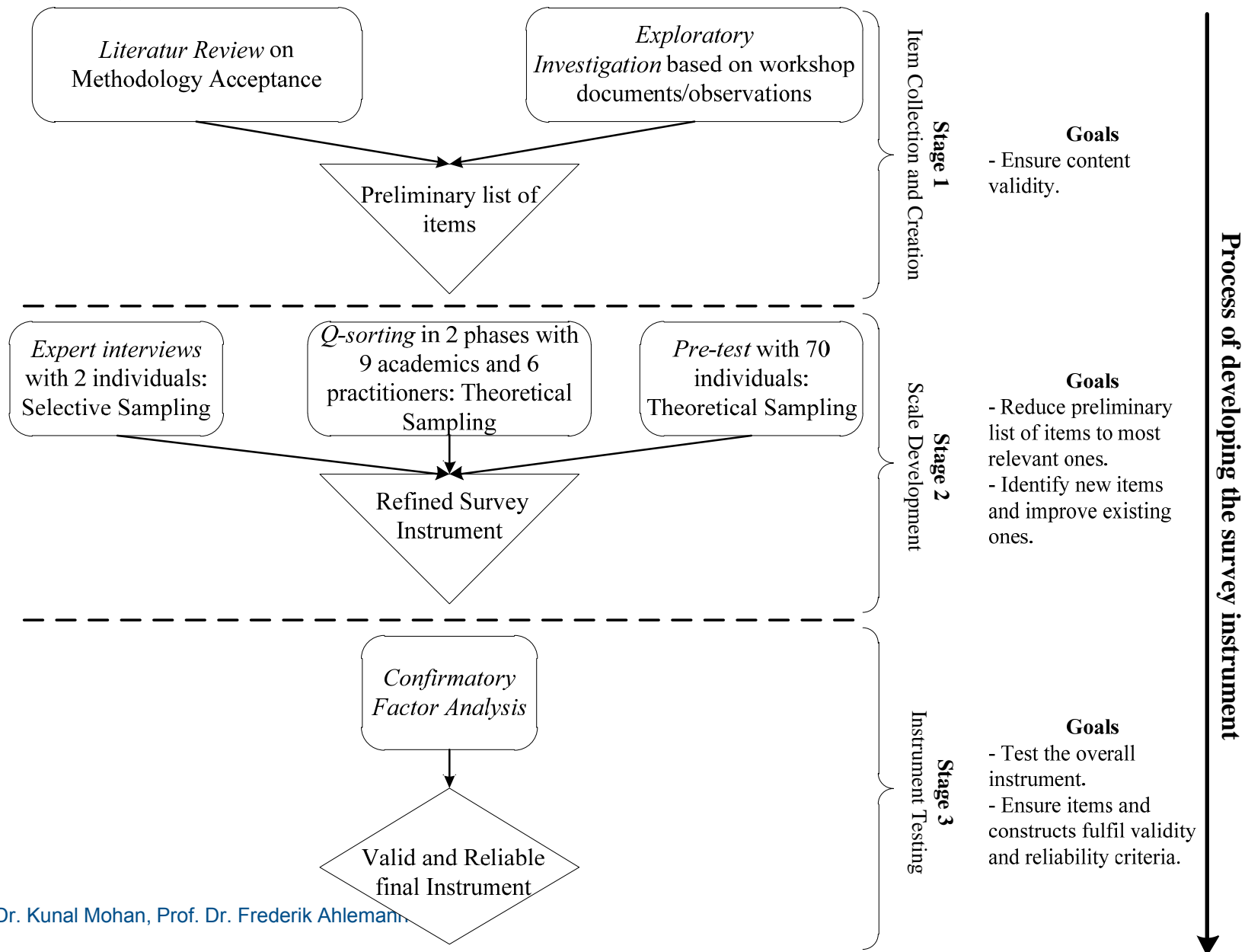
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## Research Process

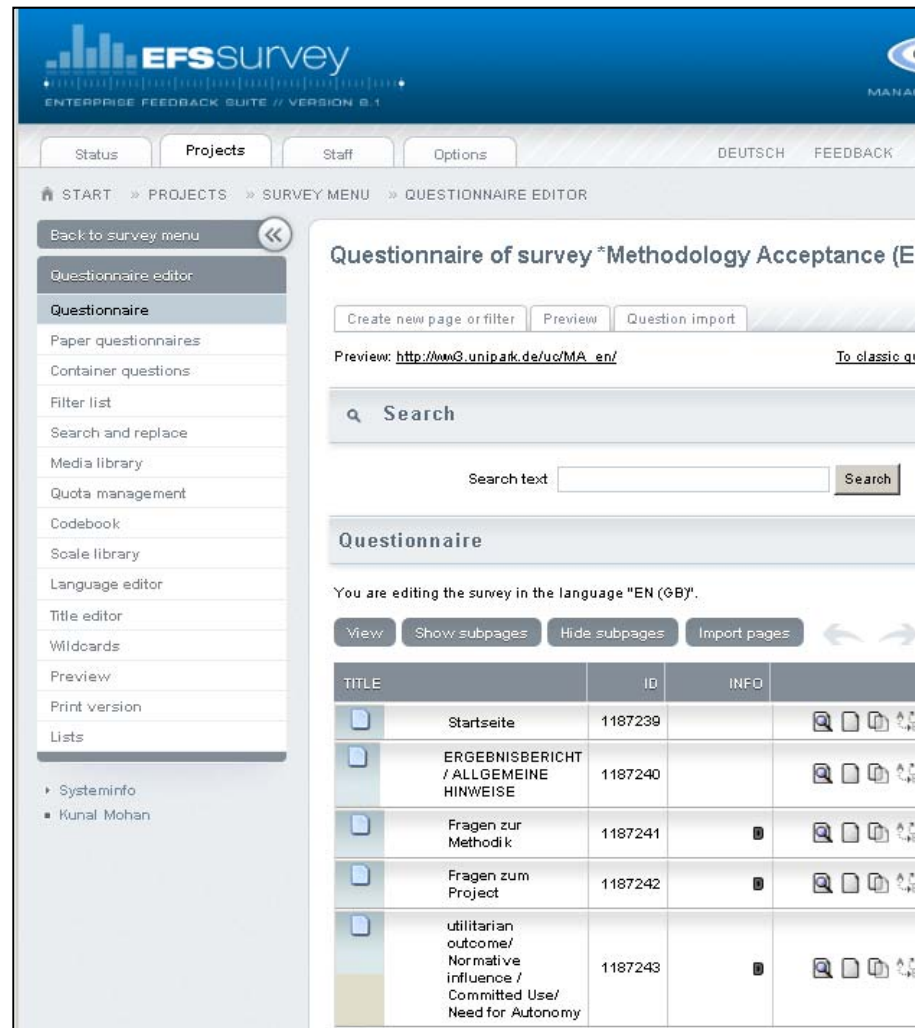
- ▶ The research process was split up in three main phases that were deployed sequentially, with the results from a preceding phase feeding the next.



## The survey instrument is developed consistent with guidelines provided by Straub et al. (2004)



# The final survey instrument was administered using the web-based tool *Unipark*



Tool interface

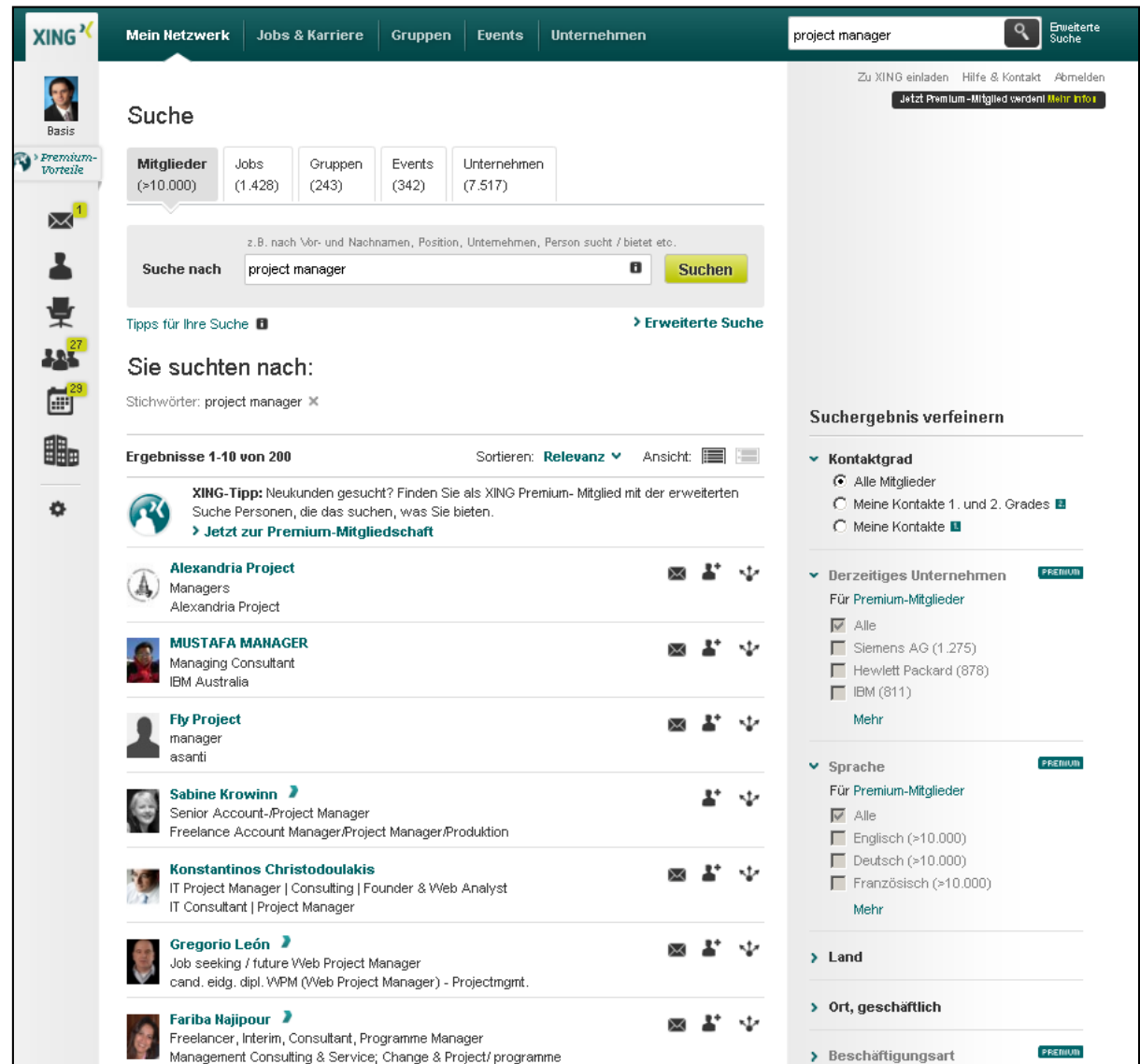


Implementation of questionnaire

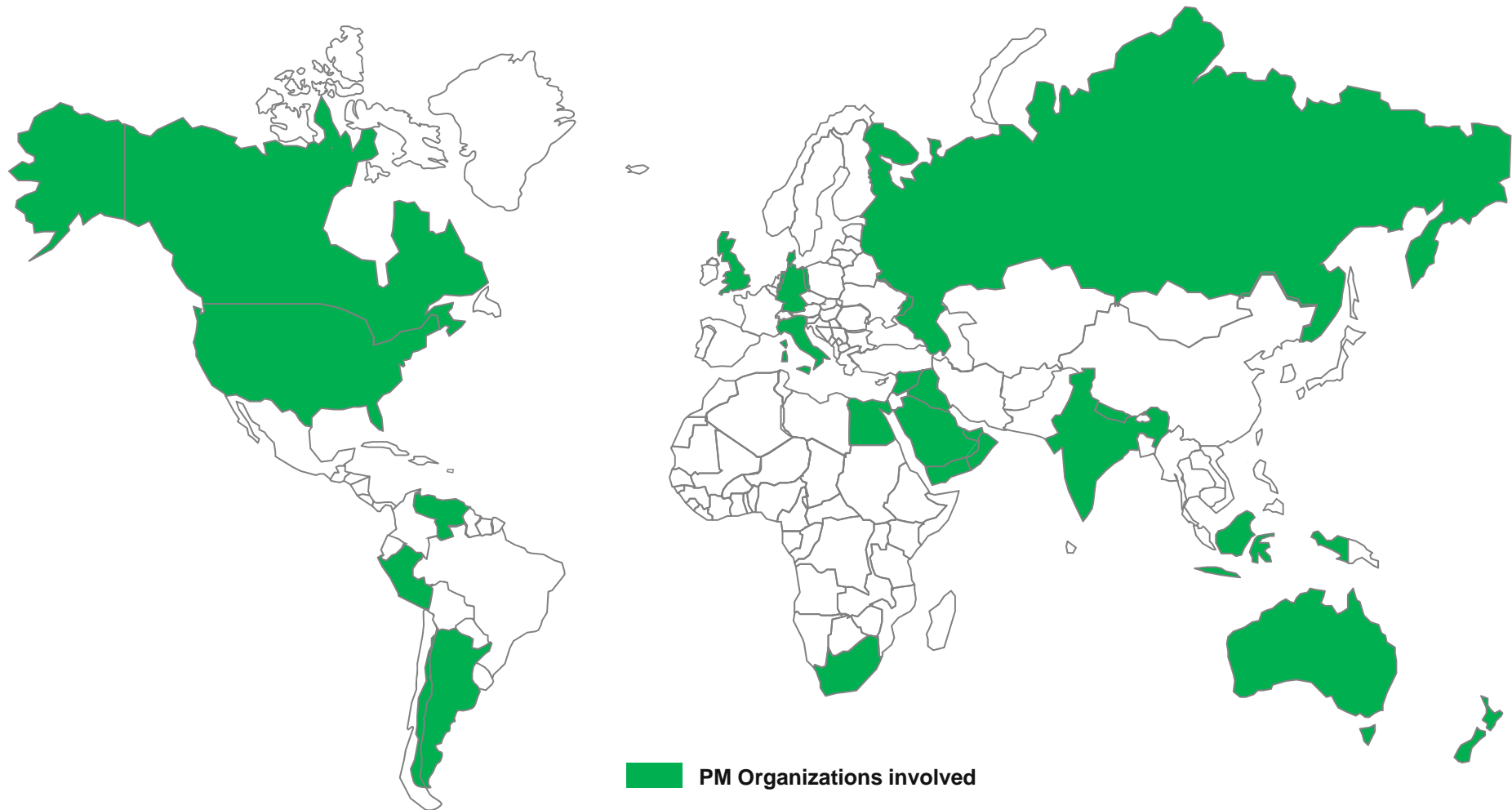


# The questionnaire was administered worldwide to a diverse population of project management methodology users

- ▶ The users were found in databases of professionals (e.g., LinkedIn, XING, CompetenceSite), through a search with keywords such as “IT project manager,” “IT portfolio manager,” etc.



**Various industry partners and project management organizations helped achieve a large, diverse, and international sample**

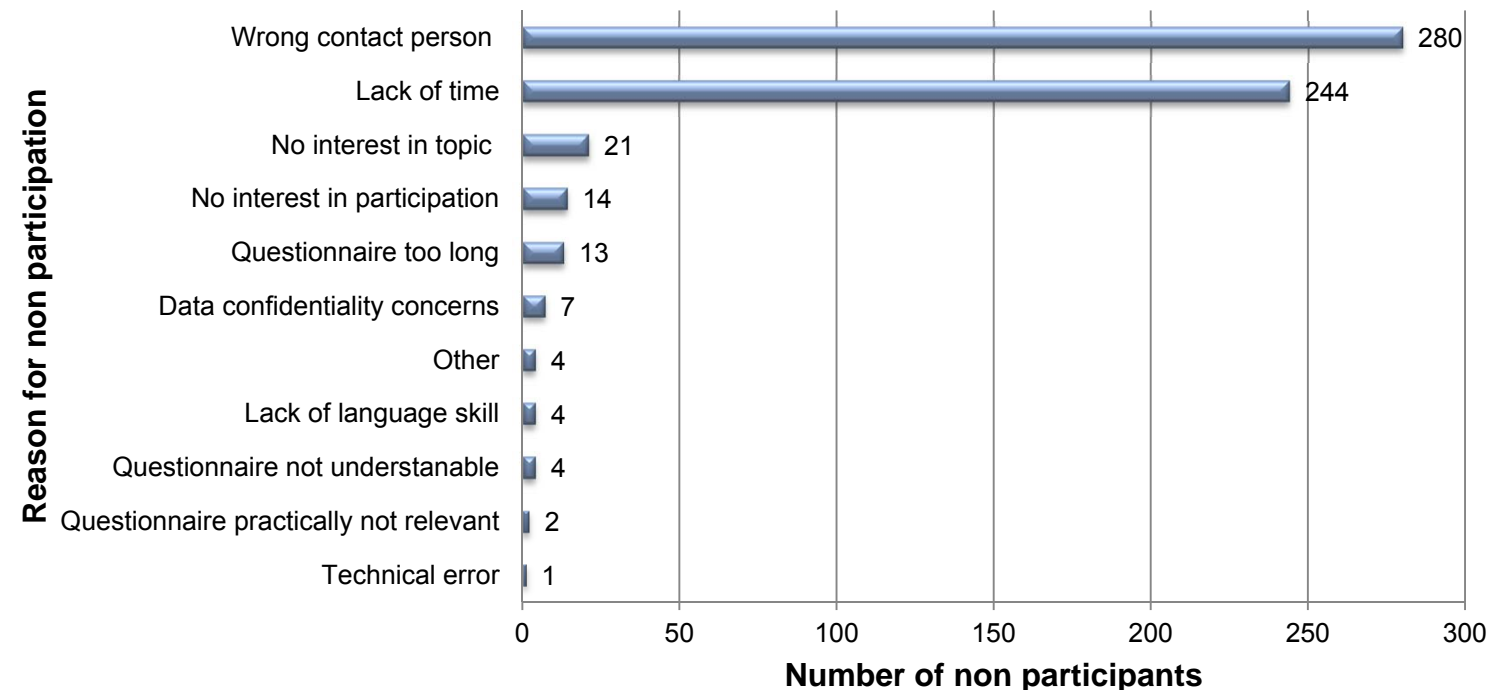


## Data was collected from June 2011 to September 2011










- ▶ Data was collected via a i) personalized, ii) anonymous online survey.
- ▶ The personalized survey URL was sent to a total of 7,982 individuals, of whom 1,249 completed the survey.
- ▶ 1,408 individuals responded anonymously, bringing the total number of participants to 2,651.
- ▶ Non-response bias was addressed by following Rogelberg and Stanton's (2007) recommendations.

- ▶ All individuals who had not participated were contacted via e-mail to inquire about their reasons for non-participation.
- ▶ Overall feedback from 594 non-participants was received.



## Data analysis of all models was conducted via structural equation modeling (SEM) technique

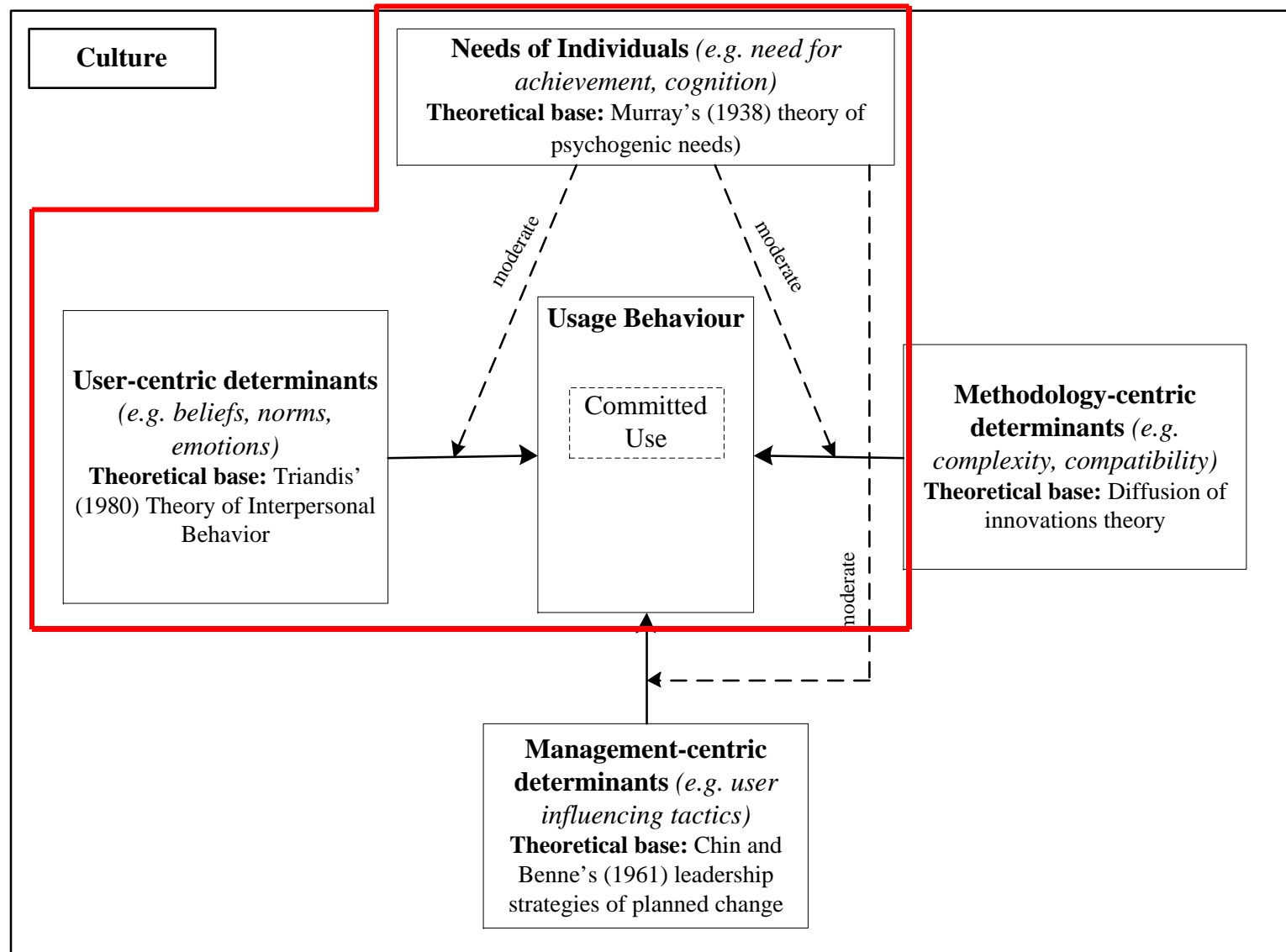
- ▶ Partial least squares (SmartPLS 2.0.M3) was used to test the model fit and to assess the research hypotheses, following guidelines specified by Chin et al. (2003).
- ▶ Carte and Russell's (2003) guidelines and recommendations were used to test and analyse interaction effects.
- ▶ Results show that all models fulfil the recommended scientific quality criteria of validity and reliability.

Quality Criteria	Testing	Result	References
Internal consistency reliability	Cronbach's alpha (CA) > 0.850 Composite reliability (CR) > 0.900		Cronbach (1951); Nunally and Bernstein (1994); Werts et al. (1974)
Indicator reliability	Indicator loadings > 0.700		Chin (1998)
Convergent validity	Average variance extracted > 0.50		Fornell and Larcker (1981)
Discriminant validity	Check of cross loadings Fornell-Larcker criterion		Chin (1998b); Fornell and Larcker (1981)
Model validity	Analysis of R <sup>2</sup> ; analysis of path coefficients, effect size analysis		Chin (1998); Cohen (1988); Stone (1974); Geisser (1975); Fornell and Cha (1994)
Significance of results	Bootstrapping		Efron (1979); Efron and Tibshirani (1993)
Common method bias	Harman's single factor test with EFA (PCA)		Podsakoff (2003)

# Agenda

<b>1</b>	<b>Management Summary</b>
<b>2</b>	<b>Motivation and Prior Research</b>
<b>3</b>	<b>Research Question and Framework</b>
<b>4</b>	<b>Theoretical Background</b>
<b>5</b>	<b>Research Process</b>
<b>6</b>	<b>Results: User, Methodology, and Management-centric Perspective</b>
<b>7</b>	<b>Limitations and Future Research</b>
<b>8</b>	<b>Classifying User Types: Stoics, Performers, and Opportunists</b>
<b>A</b>	<b>Appendices: Demographics, Survey Questions</b>

## Focus on user-centric determinants of committed usage behavior



**Past research shows that the usefulness of a methodology is the most potent factor, and therefore needs to be studied in depth**



## Research Questions

- ▶ Which project management methodology (PMM) usage benefits and costs affect an individual's committed PMM use?
- ▶ How do individuals' basic needs influence the predictive power of these different PMM usage benefits and costs?

## Variables of the model

Variable	Description
<b>Utilitarian outcome</b>	Instrumental task-specific value generated by using a methodology as perceived by the user (for e.g. increasing task performance, efficiency, productivity).
<b>Extrinsic materialistic outcome (EMO)</b>	Material, monetary or status advantages generated by using a methodology as perceived by the user (for e.g. higher salary, bonuses, career possibilities, promotion).
<b>Intrinsic materialistic outcome (IMO)</b>	Intrinsic rewards such as respect and acceptance from peers and seniors generated by using a methodology as perceived by the user.
<b>Hedonic outcome (HO)</b>	Pleasurable feelings that might be generated by using a methodology as perceived by the user (for e.g. fun, pride, excitement, exploration, challenge, loyalty, curiosity, superiority).
<b>Learning costs (LC)</b>	The time and effort required to acquire new skills or know-how in order to use a methodology effectively.
<b>Sunk costs (SC)</b>	Past costs that have already been incurred and cannot be recovered. It reflects the tendency in individuals to invest more future resources in a situation in which a prior investment has been made, compared with a similar situation in which a prior investment has not been made (Strough et al. 2008).
<b>Need for Achievement (nAch)</b>	Refers to an individual's desire to do things better, accomplish difficult tasks, overcome obstacles, become an expert, achieve high performance standards, or needs to attain significant task-related accomplishments (Murray 1938)
<b>Need for cognition (nCog)</b>	Is the desire for knowledge (Reiss 2004), and reasoning (Murray 1938).
<b>Committed use (CU)</b>	Refers to use behavior characterized by an individual's emotional attachment to, identification with, and involvement with methodology use (Meyer and Allen 1991). Committed use in such a context occurs when a user agrees internally to the usage behavior, is enthusiastic about it, and is likely to exercise initiative and demonstrate unusual effort and persistence in order to carry out the necessary actions successfully.



## Existing theories are used to formulate the underlying research hypotheses

### Research Hypotheses

**H1:** Utilitarian outcome (UO) is positively associated with committed usage (CU)

**H2:** Extrinsic materialistic outcome (EMO) will be negatively associated with CU

**H3:** Intrinsic materialistic outcome (IMO) will be positively associated with CU

**H4:** Hedonic outcome (HO) will be positively associated with CU

**H5:** Learning costs (LC) will be negatively associated with CU

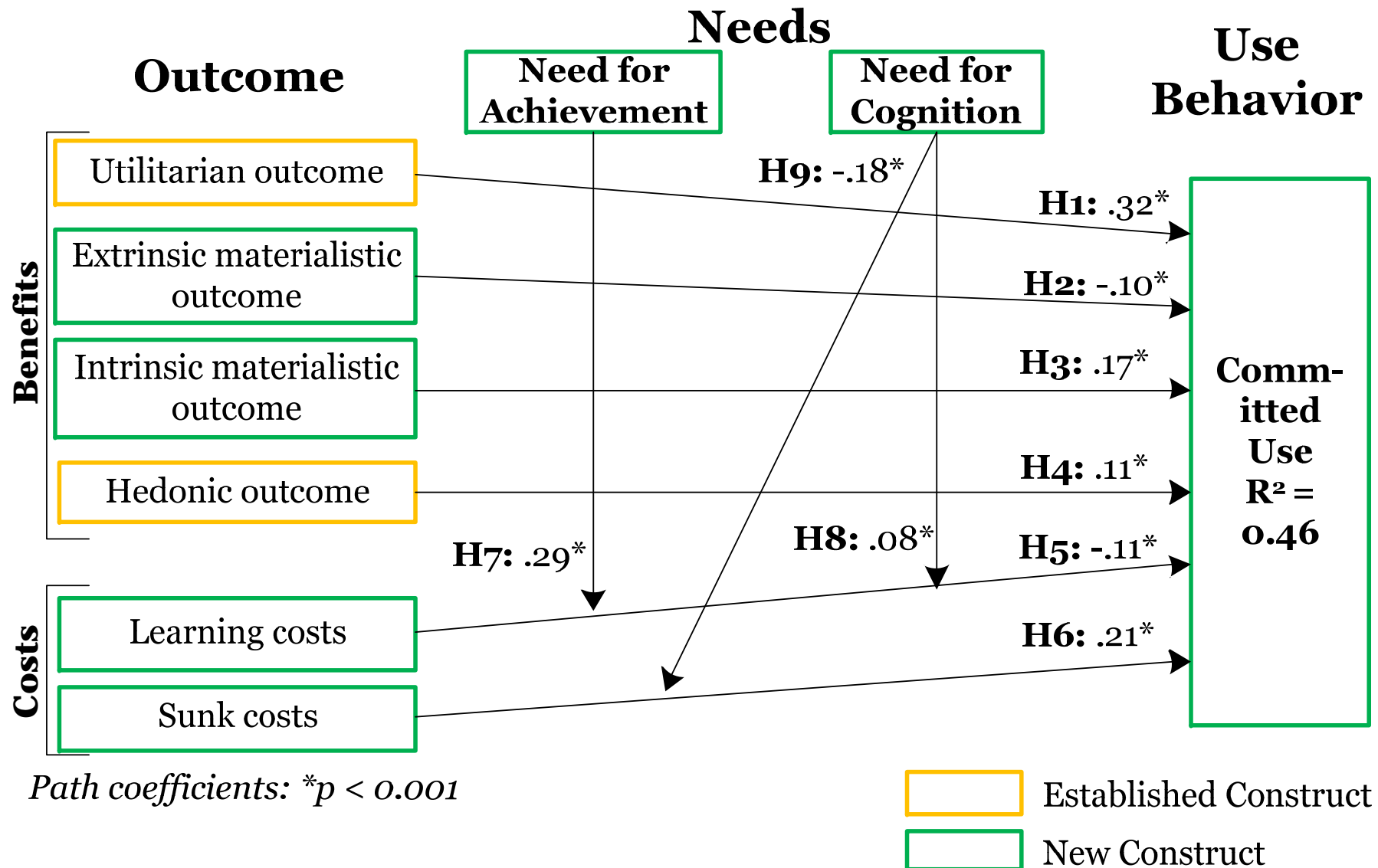
**H6:** Sunk costs (SC) will be positively associated with CU

**H7:** The negative influence of learning costs (LC) on committed usage will be moderated by the need to achieve (nAch), such that the effect will be weaker for individuals with high nAch

**H8:** The negative influence of learning costs (LC) on committed usage will be moderated by the need for cognition (nCog), such that the effect will be weaker for individuals with high nCog

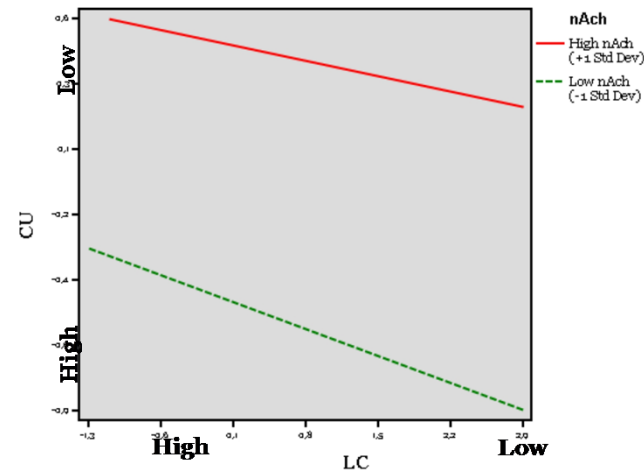
**H9:** The positive influence of sunk costs (SC) on committed usage will be moderated by need for cognition (nCog), such that the effect will be weaker for individuals with high nCog

The conceptual model is based upon sociological, psychological, and economic theories

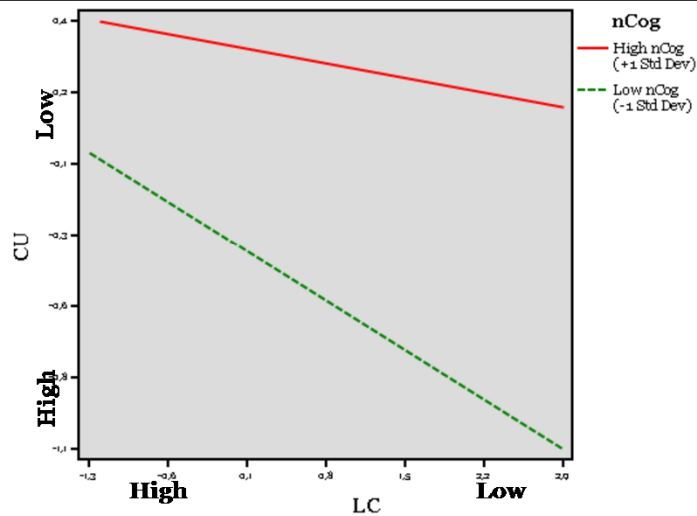


## The psychological needs of employees change the way costs and benefits influence committed usage behavior

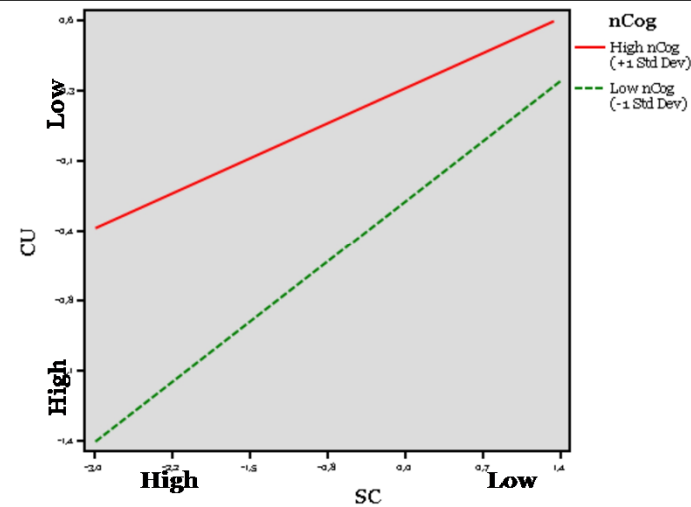
- The interaction between the independent and dependent variable (represented by the slope of the lines in the graphics) is different for people with high (red line) and low (green line) respective psychological needs.



**Moderating Effect of *nAch* on LC → CU**



**Moderating Effect of *nCog* on LC → CU**

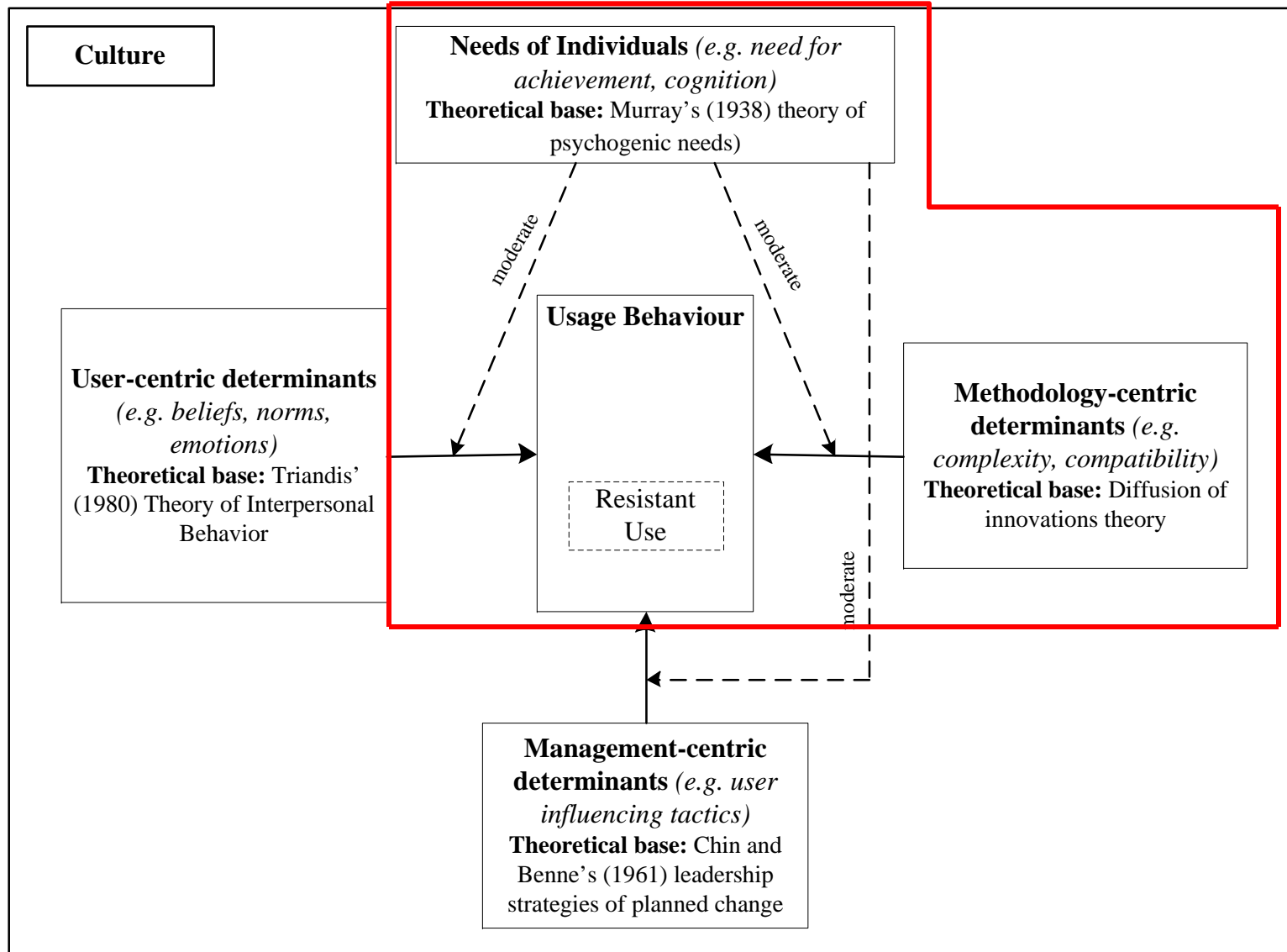


**Moderating Effect of *nCog* on SC → CU**

## Summary of empirical findings

	User-centric perspective	Selected implications and suggestions for practice
Direct effects	<ul style="list-style-type: none"> <li>▪ <i>Utilitarian, intrinsic materialistic, hedonic</i> benefits, and <i>sunk costs</i> generate committed usage.</li> <li>▪ <i>Extrinsic materialistic</i> benefits, and <i>learning costs</i> reduce commitment.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Employees driven by external rewards might simply use the methodology to gain rewards but might be apathetic rather than enthusiastic about usage, making only a minimal or average effort, and might not show any initiative.               <ul style="list-style-type: none"> <li>– Restrain from using extrinsic rewards as sole motivators.</li> </ul> </li> <li>▪ Build organizational culture and structures and that might enable employees to attain intrinsic satisfaction.               <ul style="list-style-type: none"> <li>– Cultivate a culture of open feedback where deserving employees are praised, appreciated, or given some form of symbolic award at official events or meetings.</li> </ul> </li> </ul>
Interaction effects	<ul style="list-style-type: none"> <li>▪ The negative effect of learning costs on committed usage is weaker for people with a high <i>need for achievement</i> and <i>cognition</i>.</li> <li>▪ The positive effect of sunk costs on committed usage is weaker for people with a high <i>need for cognition</i>.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Staff individuals high in nAch and nCog in large projects, since complex and bulky methodologies used in large projects are better suited to provide them with the high degree of intellectual stimulation and challenge they need.</li> <li>▪ Consider investing heavily in educating and training employees in a PMM, especially prior to its implementation, because after employees reflect on the time and effort to learn and master a methodology, they might feel more committed to using the specific methodology.</li> </ul>

## Focus on characteristics of a methodology as determinants of resistant usage behaviour



**Past research shows that inherent characteristics of a methodology influence the way employees use it**



## Research Questions

- ▶ How do PMM characteristics affect an individual's resistant usage behavior use?
- ▶ How do individuals' basic needs influence the predictive power of these different PMM attributes?

## Variables of the model

Variable	Description
<b>Relative advantage</b> (RA)	is the degree to which potential users perceive a methodology to be superior to its precursor, which is either the previous way of doing things (if there is no current way), the current way of doing things, or doing nothing.
<b>Complexity</b> (CL)	is the degree to which a methodology is perceived as difficult to understand and use.
<b>Compatibility</b> (CA)	is the degree to which a methodology is perceived to be consistent with potential users' existing social and cultural values, as well as past experiences.
<b>Need for achievement</b> (nAch)	refers to an individual's desire to do things better, accomplish difficult tasks, overcome obstacles, become an expert, achieve high performance standards, or need to attain significant task-related accomplishments (Murray 1938).
<b>Need for cognition</b> (nCog)	is the desire for knowledge (Reiss 2004) and reasoning (Murray 1938).
<b>Resistant use</b> (CU)	Resistant use occurs when an individual is consciously or unconsciously opposed to the usage behavior, which is either based on a rational cost-benefits analysis or on feelings of anxiety, and actively or passively, overtly or covertly, tries to avoid usage by, for example, refusing, arguing, delaying, or seeking to have the request or order to use the methodology nullified.

## Existing theories are used to formulate the underlying research hypotheses

### Research Hypotheses

*H1: Relative advantage (RA) is negatively associated with the resistant use (RU) of a PMM.*

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*H2: Complexity (CL) will be positively associated with the resistant use of a PMM.*

---

*H3: Compatibility (CA) will be negatively associated with the resistant use of a PMM.*

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*H4: The negative influence of relative advantage (RA) on resistant use will be moderated by the need for achievement (nAch) such that the effect will be weaker for individuals with high nAch.*

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*H5: The positive influence of complexity (CL) on resistant use will be moderated by the need for achievement (nAch) such that the effect will be weaker for individuals with nCog.*

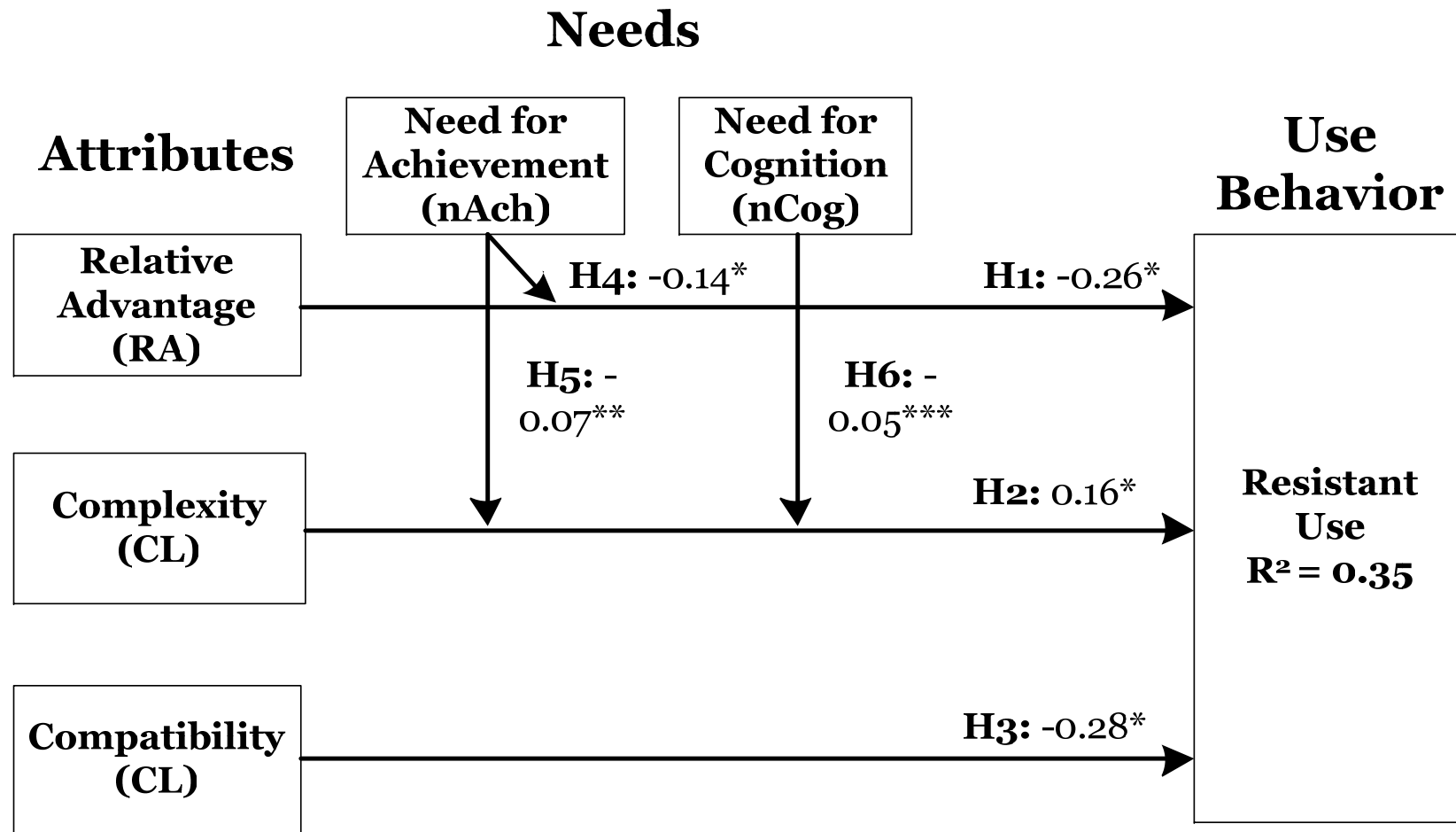
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*H6: The positive influence of complexity (CL) on resistant use will be moderated by the need for cognition (nCog) such that the effect will be weaker for individuals with high nCog.*

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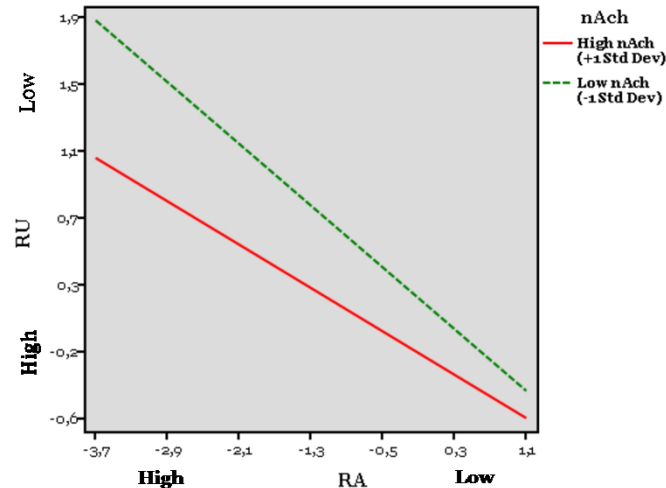


The conceptual model is based upon technological and psychological theories

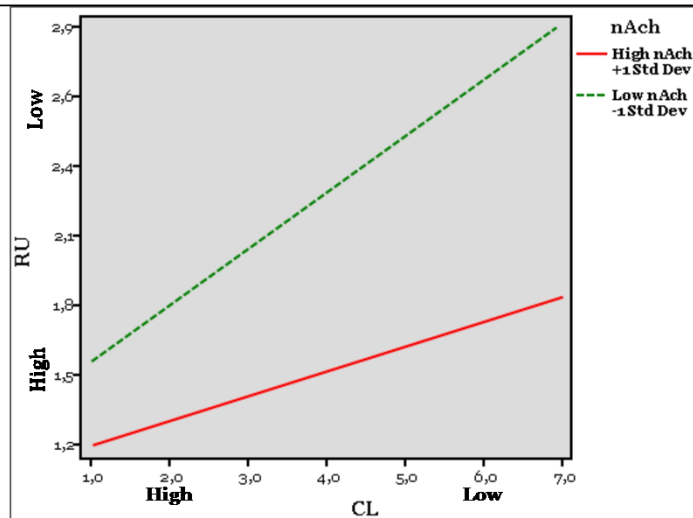


## The psychological needs of employees change the way a methodology's characteristics influence committed usage behavior

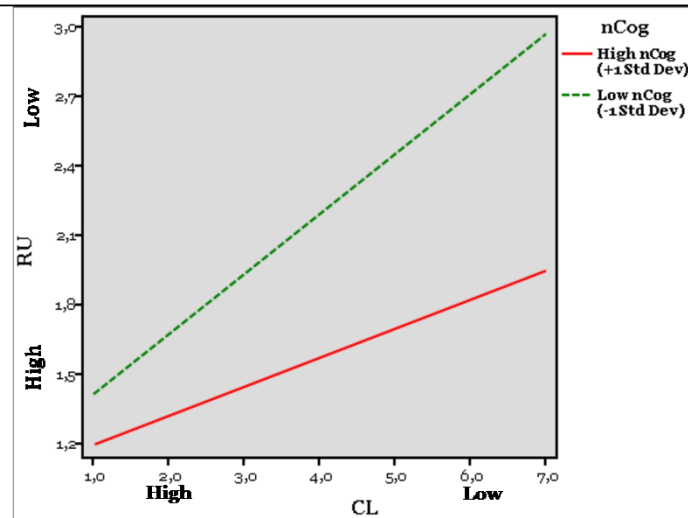
- ▶ The interaction between the independent and dependent variables (represented by the slope of the lines in the graphics) differs for people with high (red line) and low (green line) respective psychological needs.



**Moderating effect of nAch on RA→RU**



**Moderating effect of nAch on CL→RU**

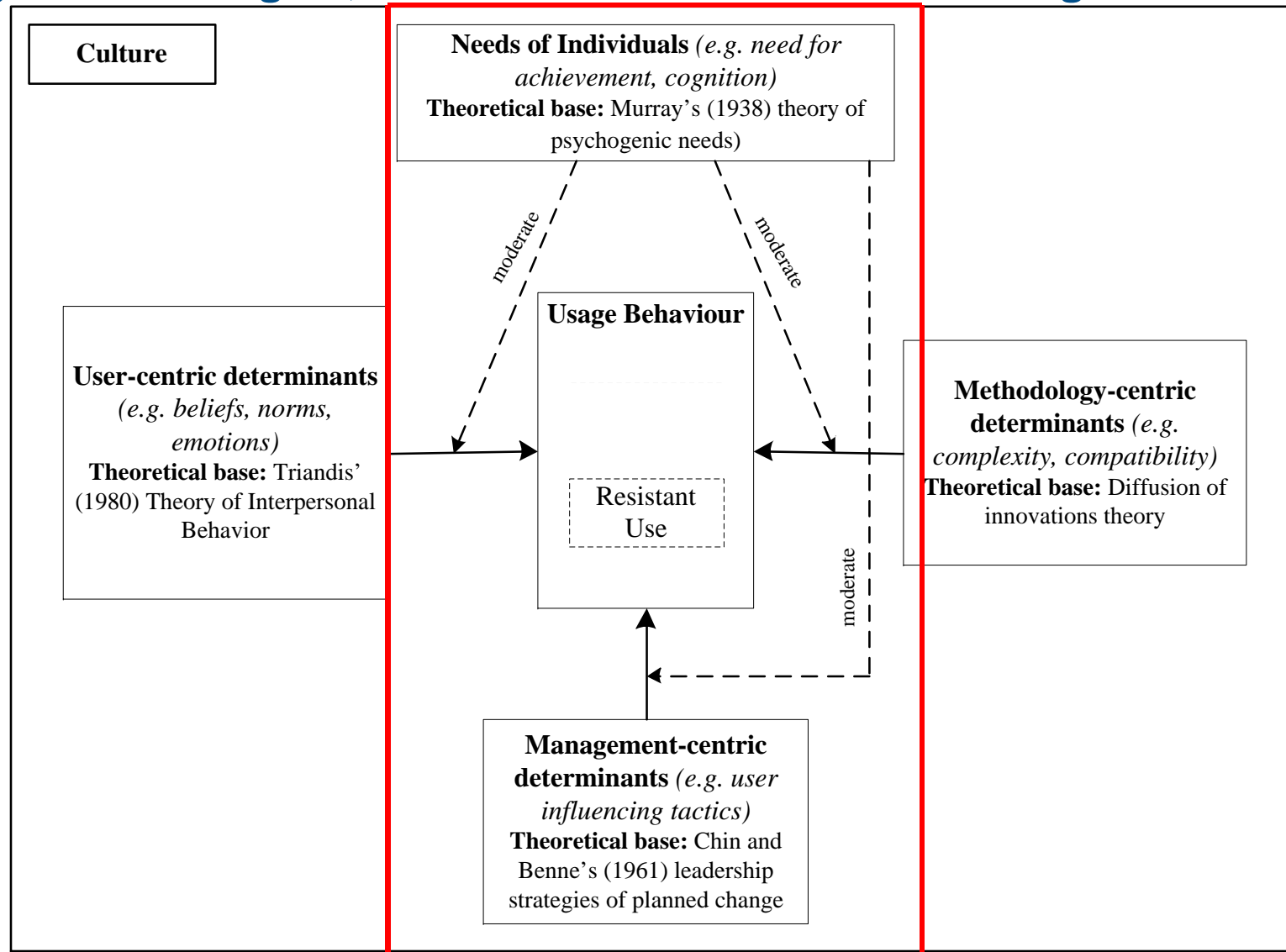


**Moderating effect of nCog on CL→RU**

## Summary of empirical findings

	Methodology-centric perspective	Selected implications and suggestions for practice
Direct effects	<ul style="list-style-type: none"> <li>▪ <i>Relative advantage</i> and <i>compatibility</i> reduce resistant usage.</li> <li>▪ <i>Complexity</i> increases resistant usage.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Employees driven by external rewards might simply use the methodology to gain rewards but might be apathetic rather than enthusiastic about usage, making only a minimal or average effort, and might not show any initiative.</li> <li>▪ Restrain from using extrinsic rewards as sole motivators.</li> <li>▪ Build organizational culture and structures and that might enable employees to attain intrinsic satisfaction, e.g. by cultivating a culture of open feedback where deserving employees are praised, appreciated, or given some form of symbolic award at official events or meetings.</li> </ul>
Interaction effects	<ul style="list-style-type: none"> <li>▪ The negative effect of relative advantage on resistant use is weaker for people with a high <i>need for achievement</i>.</li> <li>▪ The positive effect of influence of complexity on resistant use is weaker for people with a high <i>need for achievement</i> and <i>cognition</i>.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Staff individuals high in nAch and nCog in large projects, since complex and bulky methodologies used in large projects are better suited to provide them with the high degree of intellectual stimulation and challenge they need.</li> <li>▪ Making a methodology compatible with its users' beliefs and habits should be the prime concern during the early stages of introduction/implementation, even if its usefulness has to be compromised (e.g. have less features). Once the employees have become accustomed to the new methodology, management can successively improve the methodology's relative usefulness by means of small upgrades. When change is implemented in small steps, it is most likely met with less resistance. Employees will be much more inclined to use a new PMM if their perception of compatibility is not fundamentally challenged.</li> </ul>

## Focus on tactics management, used to motivate or force employees to apply methodologies, as determinants of resistant usage behavior



**Past research shows that management uses a diverse set of tactics to influence the behavior of employees**



## Research Questions

- ▶ How do user influence tactics (UITs) influence employees' resistant PMM usage behavior?
- ▶ How do individuals' psychological needs influence the potential impact of these UITs?

## Variables of the model

Variable	Description
<b>Rational- utilitarian UIT</b> (RU-UIT)	is a tactic that attempts to influence users through experts' anecdotes, demonstrations, and rational appeals regarding the work-related benefits that can be expected from the methodology use.
<b>Rational- materialistic UIT</b> (RM-UIT)	is a tactic that attempts to influence users by using tangible rewards (monetary advantages, promotion, etc.) to motivate employees to use a methodology.
<b>Cooperative UIT</b> (C-UIT)	revolves around user participation in designing, developing, and implementing the methodology. C-UIT is the collaborative process of collecting and testing relevant data and consequently validating and improving the results (Szabla 2007).
<b>Power-coercive UIT</b> (PC-UIT)	is based on the application of authority (Chin and Benne 1961). Employees under power-coercive influence are not consulted. Management adopts or develops a methodology, then simply announces its implementation, and demands that the target employees use it (Zaltman and Duncan 1977).
<b>Need for achievement</b> (nAch)	refers to an individual's desire to do things better, accomplish difficult tasks, overcome obstacles, become a expert, achieve high performance standards, or need to attain significant task-related accomplishments (Murray 1938).
<b>Need for affiliation</b> (nAffi)	is the desire to achieve acceptance from one's social surroundings. Individuals with a high need for affiliation tend to enjoy being with other people, making friends, and maintaining personal relationships.
<b>Need for blame avoidance</b> (nBla)	refers to the individuals' need to defend themselves against assault, criticism, and blame, and to conceal or justify a misdeed, failure, or humiliation. Defendant individuals are biased in favor of seeking to end behaviors that might involve worrying, fear of uncertainty, and an increased risk of anxiety (Murray 1938).
<b>Resistant use</b> (CU)	Resistant use occurs when an individual is consciously or unconsciously opposed to the usage behavior, which is either based on a rational cost-benefits analysis or on feelings of anxiety, and actively or passively, overtly or covertly, tries to avoid usage by, for example, refusing, arguing, delaying, or seeking to have the request or order to use the methodology nullified.

## Existing theories are used to formulate the underlying research hypotheses

### Research Hypotheses

**H1:** *Rational-materialistic UIT (RM-UIT) is negatively associated with resistant use (RU).*

**H2:** *Rational-utilitarian UIT (RU-UIT) is negatively associated with resistant use.*

**H3:** *Cooperative UIT (C-UIT) is negatively associated with resistant use.*

**H4:** *Power-coercive UIT (PC-UIT) is positively associated with resistant use.*

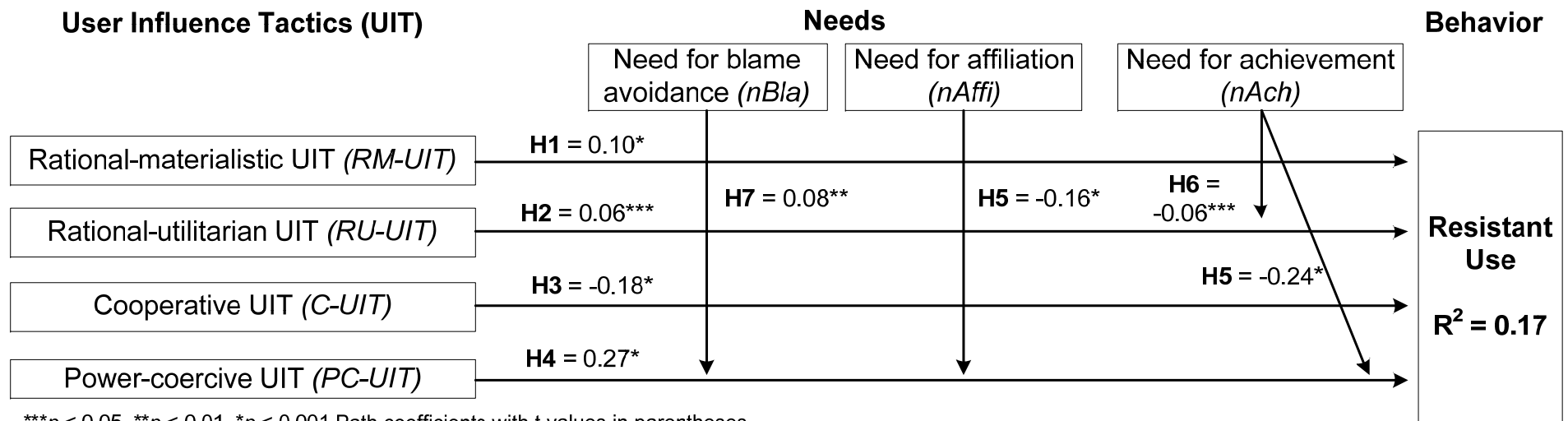
**H5:** *The positive influence of power-coercive UIT (PC-UIT) on resistant use will be moderated by the need for affiliation (nAffi) such that the effect will be weaker for individuals with high nAffi.*

**H6:** *The positive influence of power-coercive UIT (PC-UIT) on resistant use will be moderated by the need for blame avoidance (nBla) such that the effect will be weaker for individuals with high nBla.*

**H7:** *The negative influence of rational-utilitarian UIT (RU-UIT) on resistant use will be moderated by the need for achievement (nAch) such that the effect will be stronger for individuals with high nAch.*

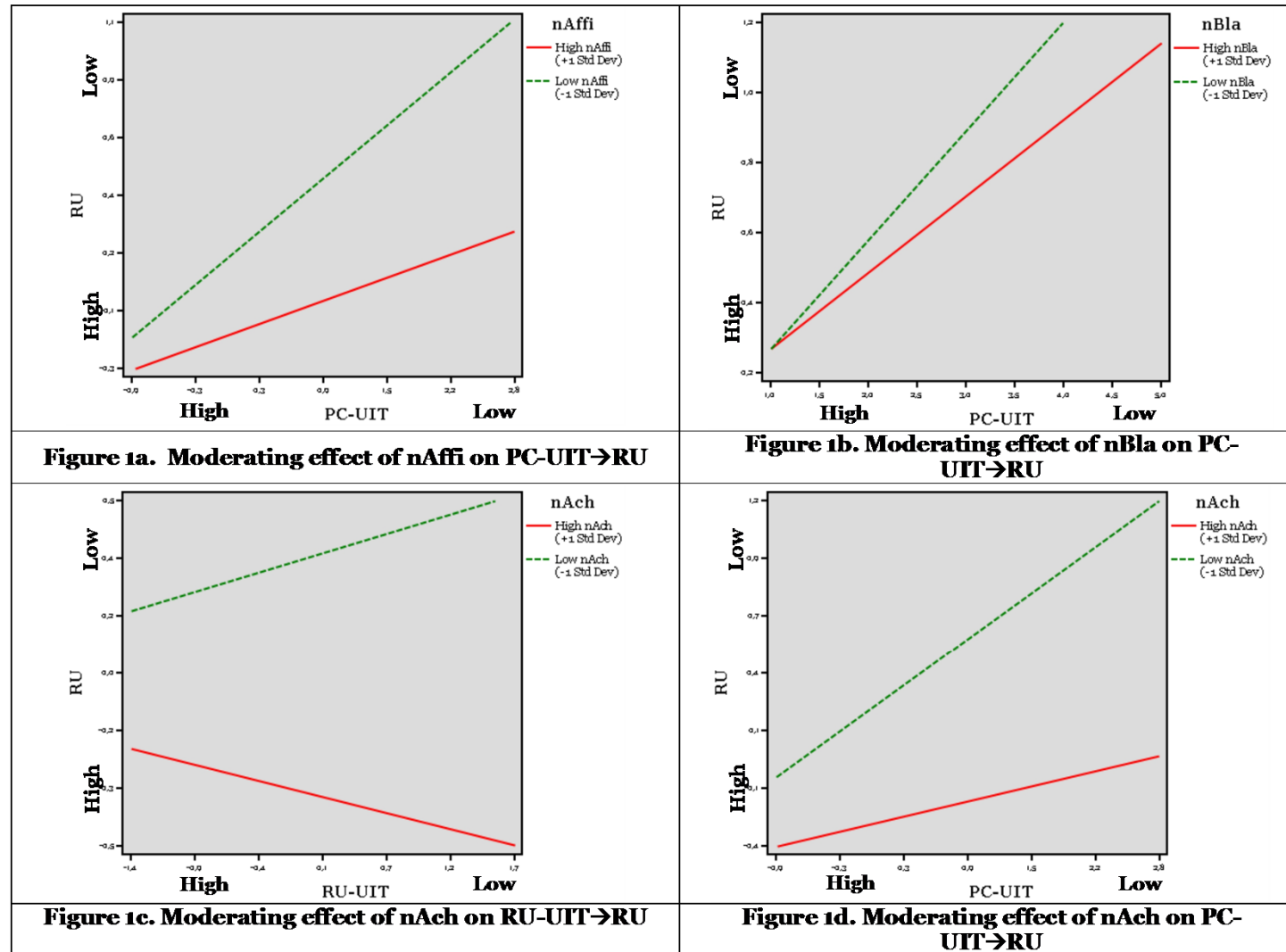
**H8:** *The positive influence of power-coercive UIT (PC-UIT) on resistant use will be moderated by the need for achievement (nAch) such that the effect will be weaker for individuals with high nAch.*

## The conceptual model is based upon technological and psychological theories





# The psychological needs of employees change the way that managerial UITs influence their resistant usage behavior



- The interaction between the independent and dependent variables (represented by the slope of the lines in the graphics) differs for people with high (red line) and low (green line) respective psychological needs.

## Summary of empirical findings

	Management-centric perspective	Selected implications and suggestions for practice
Direct effects	<ul style="list-style-type: none"> <li>▪ <i>Rational-materialistic, rational-utilitarian, and cooperative user influence tactics (UIT)</i> reduce resistant usage.</li> <li>▪ <i>Power-coercive UIT</i> increases resistant usage.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Although the use of power and pressure to force employees to use PMMs might make people use the methodology, this usage might be of a resistant, counterproductive, and destructive nature.</li> <li>▪ Cooperative managerial strategy which includes the employees in the methodology selection and development process lead to a reduced usage resistance.</li> <li>▪ While creating awareness of the PMM's instrumental usefulness among employees weakens employee resistance, using purely extrinsic PMM usage benefits, such as money and perks, as motivators increases resistance.</li> </ul>
Interaction effects	<ul style="list-style-type: none"> <li>▪ The positive effect of <i>power-coercive UIT</i> on resistant use is weaker for people with a high <i>need for affiliation, blame avoidance, and achievement</i>.</li> <li>▪ The <i>rational-utilitarian UIT</i> on resistant use is stronger for people with a high <i>need for achievement</i>.</li> </ul>	<ul style="list-style-type: none"> <li>▪ However, individuals high in nAch, in particular males, are more willing to submit to managerial demands in order to be viewed more favorably by superiors and acquire scarce resources that are critical for their work success.</li> <li>▪ A similar effect can be noticed in employees with a strong need to avoid being blamed for mistakes, as well as those who want to be liked by others and have deep interpersonal relationships with them.</li> <li>▪ If called for, superiors should use pressure and power only on those employees who have a strong need for achievement, affiliation, and blame avoidance. Use of authority and pressure to influence the usage behavior of employees low in the above-mentioned needs might backfire and cause them to become highly resistant and counterproductive.</li> </ul>

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# Limitations and future research

## Limitations

- The use of **perception-based measures** rather than objective ones are known to be influenced by personal biases and can therefore often contaminate the results.
- **Newly developed constructs** should be further refined.
- **Confirmation and recall bias** of participants when answering questions.

## Future Research

- Understanding how **culture** influences the importance assigned by individuals to the specific attributes.
- Examine how use behaviour affects productivity and/or efficiency.
- **Longitudinal** study to better understand the evolution and development of attitude and needs.
- **Multi-method approach** involving both qualitative as well as quantitative techniques.
- Verification of the models in **other contexts**.

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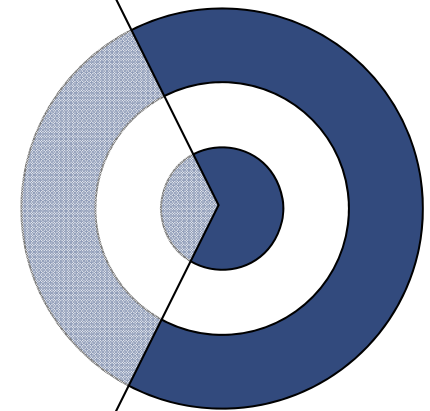
**In addition to the variables examined earlier, empirical evidence from our explorative, qualitative study suggests additional determinants**

<b>Habits</b>	People are usually willing to accept methodologies if they are <b>accustomed to the work practices involved</b> .
<b>Emotions and needs</b>	When people master and apply a methodology successfully, they experience <b>pride, loyalty, excitement, accomplishment, and self-actualization</b> .
<b>Self-perception</b>	Inexperienced professionals often <b>doubt their skills and knowledge</b> regarding the correct use of a methodology.
<b>Different kinds of use</b>	People use methodologies in very different ways. Sometimes they are <b>highly committed</b> , sometimes they just do the <b>bare minimum</b> to comply with the rules.
<b>Role of experts</b>	People are <b>responsive to external expert advice</b> when it comes to selecting and using a methodology.

This sub-research aims to uncover the different types of **PMM** users

## Research Questions (RQ)

What are the different **types of users**?

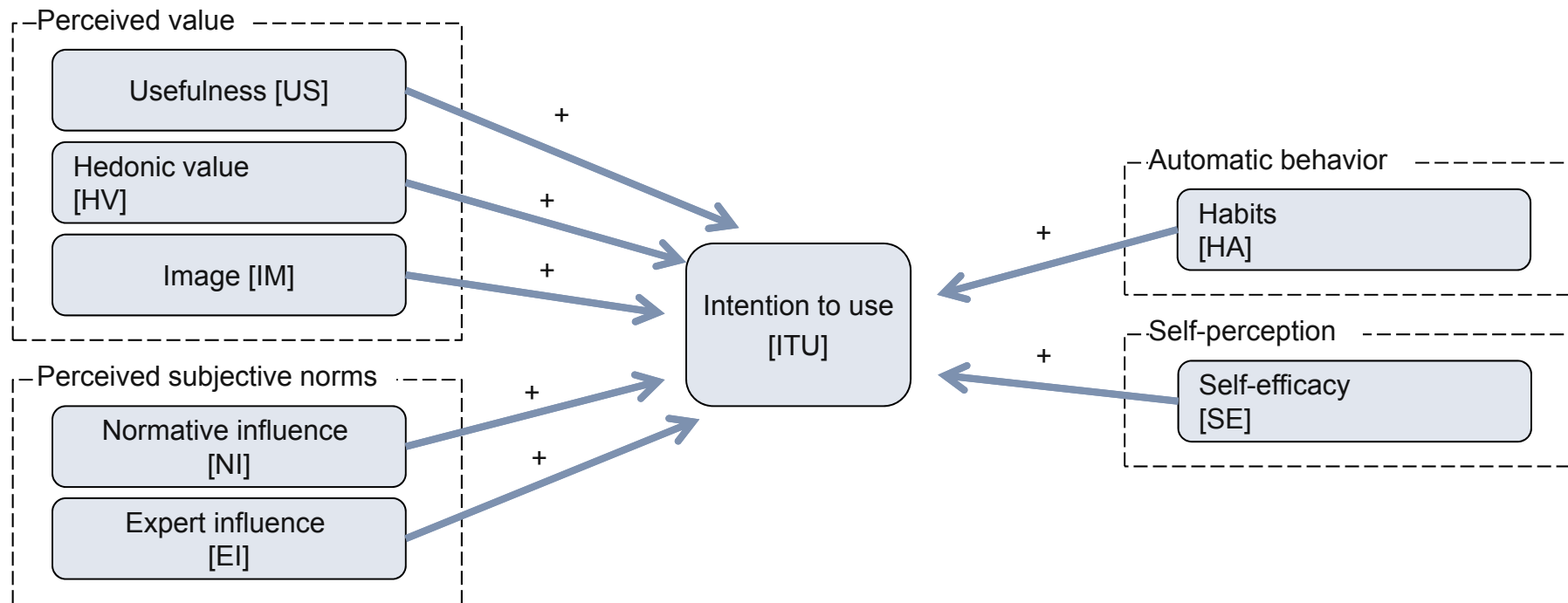


## To answer the research question, five new constructs are added to the model

Habit (HA)	The degree to which someone <b>is used to apply</b> a methodology. (Limayem et al. 2007), (Guinea et al. 2009)
Hedonic value (HV)	The degree to which the application of a methodology leads to <b>positive emotions</b> . (Babin et al. 1994), (Van der Heijden 2004)
Image (IM)	The degree to which the <b>image and status</b> or perception through others is improved by using a methodology. (Holloway 1977), (Moore et al. 1991)
Self-efficacy (SE)	The degree to which a person believes to be <b>capable of mastering the methodology</b> . (Bandura 1988), (Wood et al. 1989)
Expert influence (EI)	The degree to which a person <b>consults experts</b> prior to using a methodology. (Bearden et al. 1989)



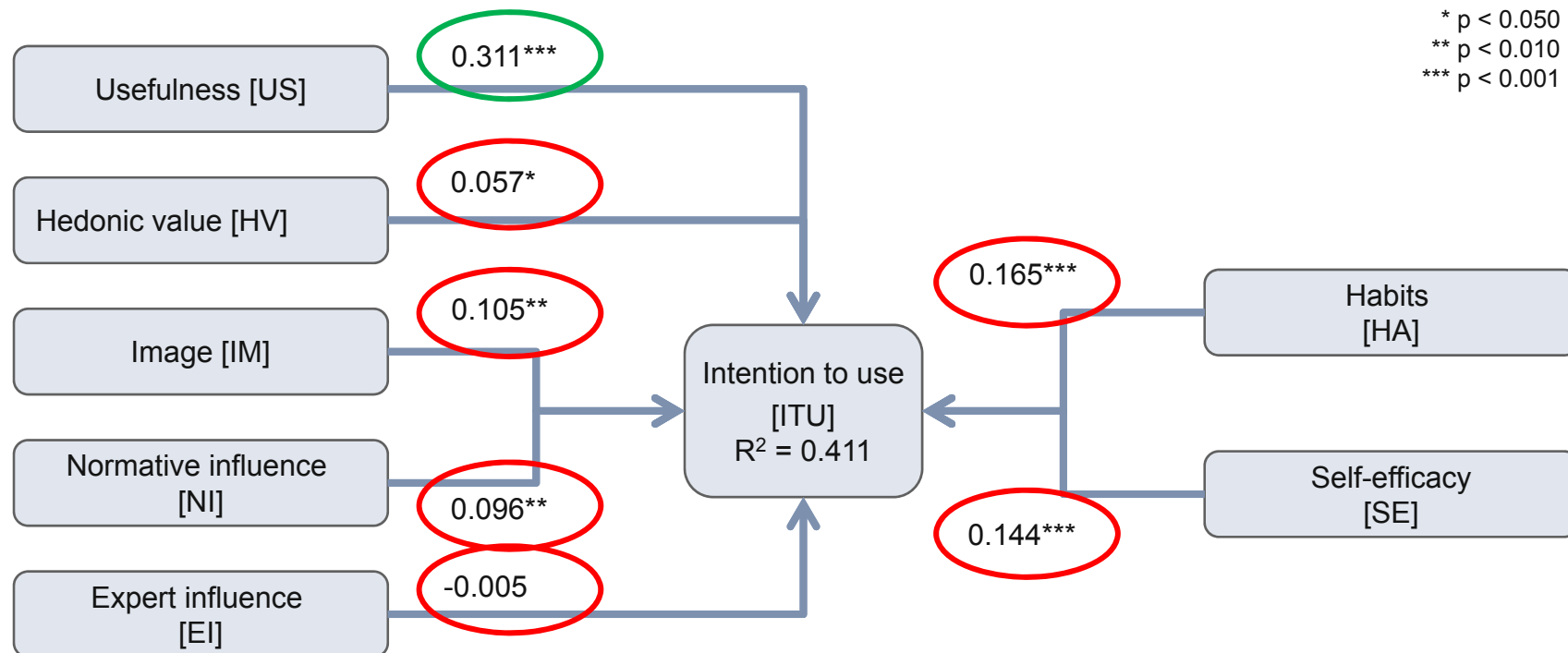
## This leads to an improved model for methodology acceptance



## The sample of 899 respondents is highly heterogeneous

Control variables	Values
Project management experience	From 0 to 41 years; 11 years on average
Age	41 years on average
Methodology experience	6 years on average; involved in 14 projects
Certification	58% have a certified PM education
Project duration	19 months on average
Industries	All industries
Project types	All types, including infrastructure and software development, process management, and product development
Gender	85% male, 15% female
Project role	64% project managers, 12% team members, 10% program managers, 6% PMO, 8% other
Countries	Germany 26%, USA 11%, Switzerland 7%, Hungary 7%, India 6%, UK 6%, 37% other (85 countries)

The results of the first parameter estimations were disappointing...



## Using FIMIX-PLS, we divided the sample into segments

### FIMIX PLS

- Finite mixture implementation in SmartPLS (Sarstedt and Ringle 2010).
- Based on the work of (Hahn et al. 2002).
- Sample is divided into segments so that path coefficients for the segments are maximized.
- Application of the heuristic expectation maximization (EM) algorithm.
- Approach: (a) assign objects to segments, (b) estimate parameters, (c) reassign to segments based on probability of assignment, continue with (b). Terminate when (b) and (c) no longer lead to improved results.

### Identification of segments

- Identified number of segments by comparing results of 2, 3, 4, 5 segments, with 3 segments producing the best results.
- Used the previous model for the segmentation process.
- Constraint: Segments need to have a suitable size for estimating parameters (i.e. not too small).
- Quality criterion used: CAIC (Consistent Akaike's Information Criterion) proposed by (Sarstedt and Salcher 2007).

## FIMIX-PLS reveals that there is significant heterogeneity in the sample

Characteristics	Segment 1 “Stoics”	Segment 2 “Performers”	Segment 3 “Opportunists”
Segment size	39.87%	40.42%	19.71%
Interpretation	<ul style="list-style-type: none"> <li>• Have a strong focus on accustomed work practices.</li> <li>• Do not like to change their behavior.</li> <li>• Stick to “successful” practices as long as possible.</li> <li>• Have limited perseverance when a work practice is not enjoyable.</li> </ul>	<ul style="list-style-type: none"> <li>• Have a strong focus on performance improvements.</li> <li>• Judge behavior based on performance expectations.</li> <li>• Have a high degree of perseverance.</li> </ul>	<ul style="list-style-type: none"> <li>• Behavioral intentions are based on social expectations and social influence.</li> <li>• Have limited perseverance when a work practice is not enjoyable.</li> <li>• Are “carefully curious.”</li> </ul>
Variance	Medium	Low	High

**Stoics want to reuse, performers want to optimize, and opportunists do whatever their boss demands**

### Path coefficients

<u>Intention to use (ITU)</u>	ITU R <sup>2</sup>	US (Usefulness)	HV (Hedonic value)	IM (Image)	NI (Normative influence)	EI (Expert influence)	HA (Habits)	SE (Self-efficacy)
Stoics	0.756	0.097***	0.025	-0.003	0.055***	0.024	<b>0.744***</b>	0.103***
Performers	0.970	<b>0.999***</b>	-0.009	-0.027***	0.014*	-0.010*	-0.038***	0.030***
Opportunists	0.181	-0.024	<b>0.142***</b>	<b>0.269***</b>	<b>0.180***</b>	-0.161***	-0.265***	0.115***
All	0.411	<b>0.311***</b>	0.057	0.105***	0.096***	-0.005	<b>0.165***</b>	<b>0.144***</b>

\* p < 0.050  
 \*\* p < 0.010  
 \*\*\* p < 0.001

**Based on four usage constructs and three segments, 16 models can be estimated**

Dependent variable Segment	Intention to use (ITU)	Committed use (CU)	Compliant use (CU)	Resistant use (RU)
<b>Stoics</b>	Model 1a	Model 1b	Model 1c	Model 1d
<b>Performers</b>	Model 2a	Model 2b	Model 2c	Model 2d
<b>Opportunists</b>	Model 3a	Model 3b	Model 3c	Model 3d
<b>Complete sample</b>	Model 4a	Model 4b	Model 4c	Model 4d

## Committed use can be expected when the methodology is useful and applicable

### Path coefficients

<u>Committed use (CU)</u>	<b>CU R<sup>2</sup></b>	<b>US</b> (Usefulness)	<b>HV</b> (Hedonic value)	<b>IM</b> (Image)	<b>NI</b> (Normative influence)	<b>EI</b> (Expert influence)	<b>HA</b> (Habits)	<b>SE</b> (Self-efficacy)
Stoics (1b)	0.356	<b>0.151**</b>	<b>0.157***</b>	0.143***	0.019	0.073**	<b>0.155***</b>	<b>0.235***</b>
Performers (2b)	0.620	<b>0.560***</b>	0.038	0.019	0.014	0.084***	-0.095**	<b>0.315***</b>
Opportunists (3b)	0.298	<b>0.190***</b>	0.072**	0.105***	0.077***	0.122***	0.010	<b>0.379***</b>
All (4b)	<b>0.441</b>	<b>0.305***</b>	0.086***	0.094***	0.029	0.079***	0.012	<b>0.332***</b>

\* p < 0.050  
 \*\* p < 0.010  
 \*\*\* p < 0.001



## User types switch to compliant use for different reasons

### Path coefficients

<u>Compliant use (CPU)</u>	<b>CPU R<sup>2</sup></b>	<b>US</b> (Usefulness)	<b>HV</b> (Hedonic value)	<b>IM</b> (Image)	<b>NI</b> (Normative influence)	<b>EI</b> (Expert influence)	<b>HA</b> (Habits)	<b>SE</b> (Self-efficacy)
Stoics (1c)	0.166	0.031	<b>-0.277***</b>	0.013	-0.001	0.034	-0.107**	<b>-0.179***</b>
Performers (2c)	0.195	<b>-0.354***</b>	-0.074*	0.092**	-0.042	0.139*	0.011**	-0.102**
Opportunists (3c)	0.301	-0.029	<b>-0.387***</b>	0.032	-0.074**	0.166	-0.124***	<b>-0.148***</b>
All (4c)	<b>0.173</b>	-0.094**	<b>-0.223***</b>	0.050	0.001	0.106	-0.073*	<b>-0.160***</b>

\* p < 0.050  
 \*\* p < 0.010  
 \*\*\* p < 0.001

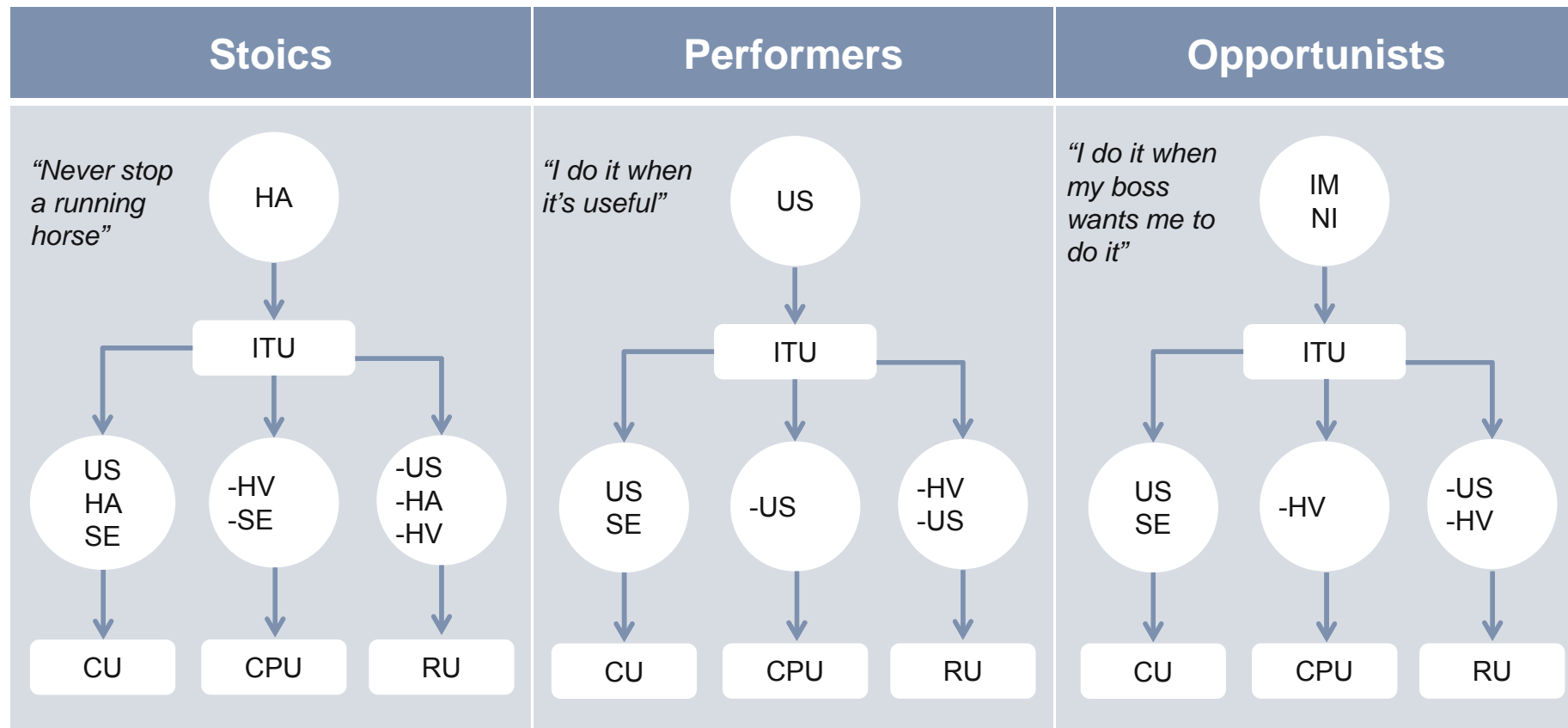
## Resistant use is the result of perceiving a multitude of possible deficiencies

### Path coefficients

<u>Resistant use</u> (RU)	<b>RU</b> <b>R<sup>2</sup></b>	<b>US</b> (Usefulness)	<b>HV</b> (Hedonic value)	<b>IM</b> (Image)	<b>NI</b> (Normative influence)	<b>EI</b> (Expert influence)	<b>HA</b> (Habits)	<b>SE</b> (Self-efficacy)
Stoics (1d)	0.285	<b>-0.183***</b>	<b>-0.203***</b>	0.088***	-0.013	0.119*	-0.257***	-0.116***
Performers (2d)	0.462	<b>-0.629***</b>	<b>-0.170***</b>	0.130***	-0.017	0.048**	0.071**	-0.090**
Opportunists (3d)	0.427	<b>-0.172***</b>	<b>-0.399***</b>	-0.113***	-0.122***	0.155***	-0.070**	-0.092***
<b>All</b> <b>(4d)</b>	0.338	<b>-0.293***</b>	<b>-0.261***</b>	0.046	-0.035	<b>0.092***</b>	-0.091**	-0.126***

\* p < 0.050  
 \*\* p < 0.010  
 \*\*\* p < 0.001

## Stoics, performers, and opportunists have different archetypical usage patterns



## There is a clear theoretical contribution

- There are different kinds of usage behaviors.
- Existing models can only explain committed use.
- Habits and a methodology's perceived hedonic value can explain compliant and resistant use very well.
- Methodology users are not a homogeneous group.
- Segmentation based on usefulness, habits, and image seems to be most promising.



Deeper understanding of the **nature of methodology use.**

First step towards understanding the **influence of personality traits and their effects on usage behavior.**

## There are also managerial implications

- When designing methodologies:
  - **Include accustomed and established work practices** as much as possible (follow a participatory design approach).
  - **Enable easy learning, exploration, and professional self-actualization**, e.g. by giving degrees of freedom to the users.
  - **Consider individual usefulness.**

⇒ **Focus on individuals instead of focusing solely on organizational impact.**
- When introducing methodologies:
  - Implement training and change activities **targeting each user segment's individual needs** (e.g. focus on “*what changes and why*” versus “*how can I improve my performance*”).
  - Provide **opportunities to explore** the new methodology.
  - **Be prepared to identify compliant and resistant use** and to react to it (monitoring system).

## The study still has some limitations

### Limitations and next steps

- It currently focuses solely on **project management**. (A study with enterprise architecture methodologies is ongoing.)
- **The characterization of segments** needs to be refined .  
(The personality trait constructs have been collected.)
- The **role of moderators** has not been analyzed so far, e.g. age or gender. (This will be done with a larger sample collected in the meantime.)
- It is unclear **which methodology characteristics** lead to increased hedonic value.
- There might be a **bias in the sample** due to the data collection approach.

# Agenda

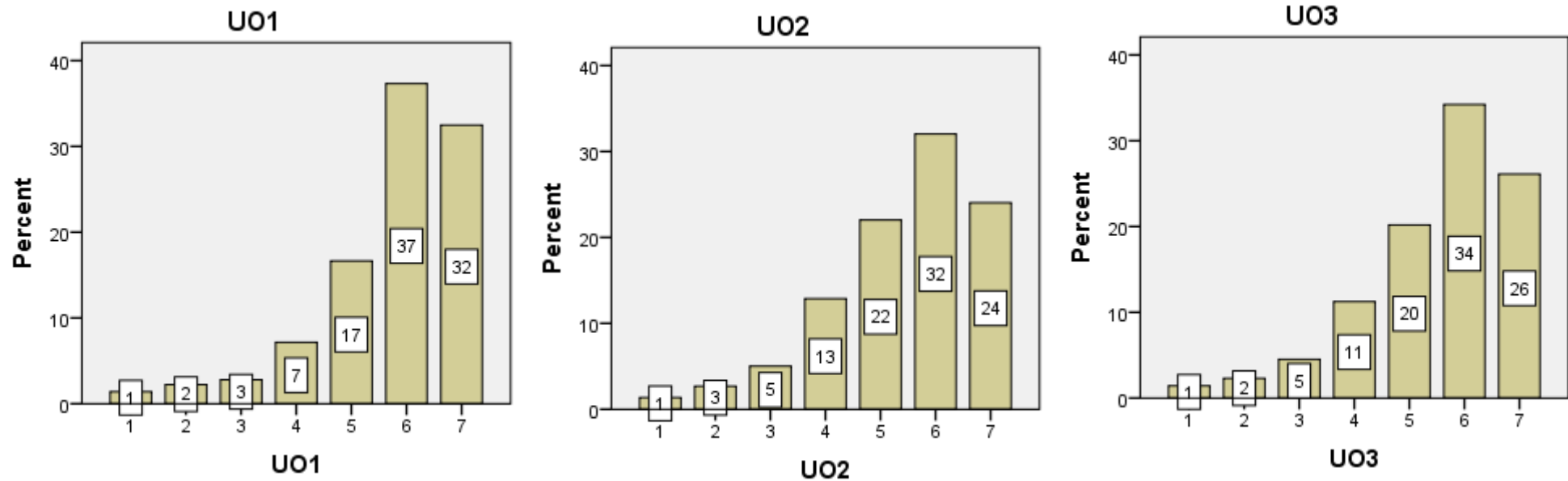
<b>1</b>	<b>Management Summary</b>
<b>2</b>	<b>Motivation and Prior Research</b>
<b>3</b>	<b>Research Question and Framework</b>
<b>4</b>	<b>Theoretical Background</b>
<b>5</b>	<b>Research Process</b>
<b>6</b>	<b>Results: User, Methodology, and Management-centric Perspective</b>
<b>7</b>	<b>Limitations and Future Research</b>
<b>8</b>	<b>Classifying User Types: Stoics, Performers, and Opportunists</b>
<b>A</b>	<b>Appendices: Demographics, Survey Questions</b>

## Descriptive overview of responses\*: Utilitarian outcome

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
UO1	Using the methodology improves my job performance.
UO2	Using the methodology in my job increases my productivity.
UO3	Using the methodology enhances my effectiveness on the job.



\* Based on a sample size of 2651 participants

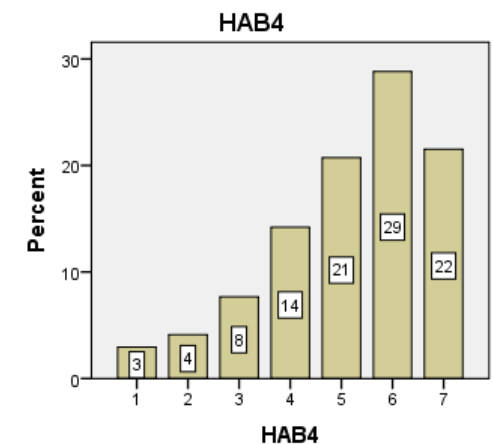
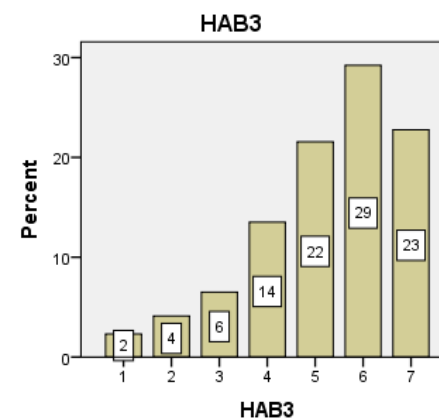
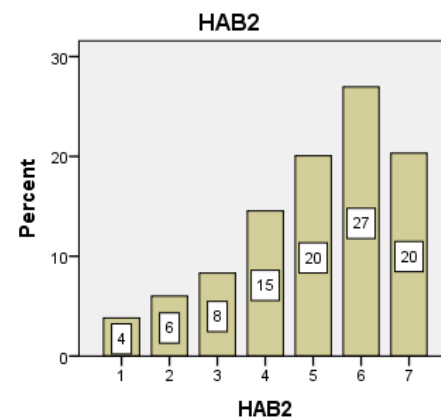
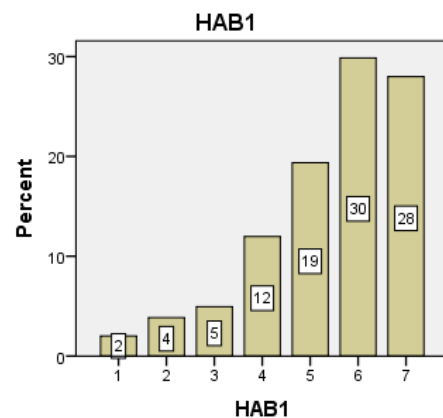


# Descriptive overview of responses: Habit

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
HAB1	The use of the methodology has become a habit for me.
HAB2	I don't even think twice before using the methodology.
HAB3	Using the methodology has become natural to me.
HAB4	I automatically use the methodology in my job.

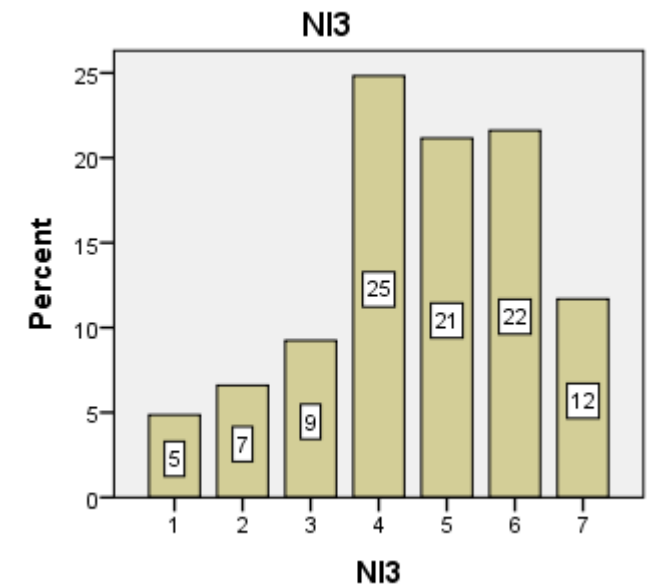
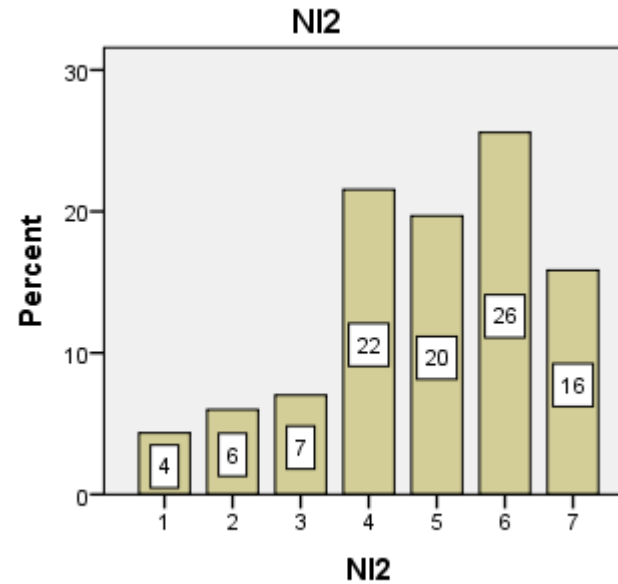
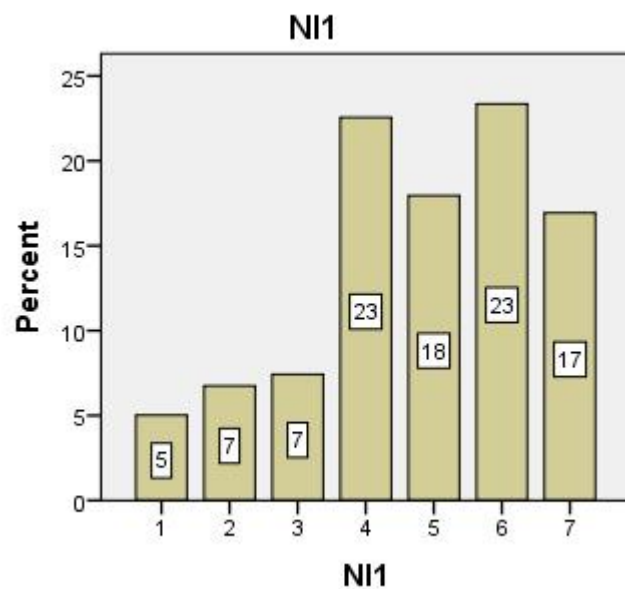


# Descriptive overview of responses: Normative influence

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
NI1	People at work who influence my behavior (e.g. superiors, colleagues) think that I should use the methodology.
NI2	People at work who are important to me (e.g. superiors, colleagues) think that I should use the methodology.
NI3	People in my organization who I work with think that I should use the methodology.

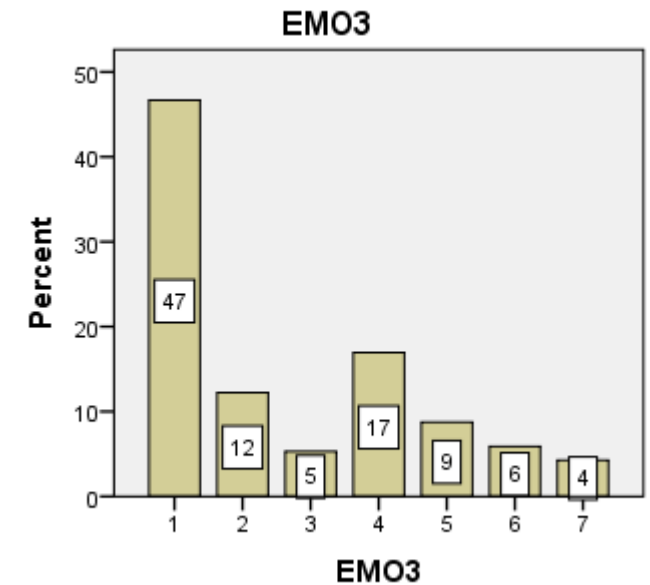
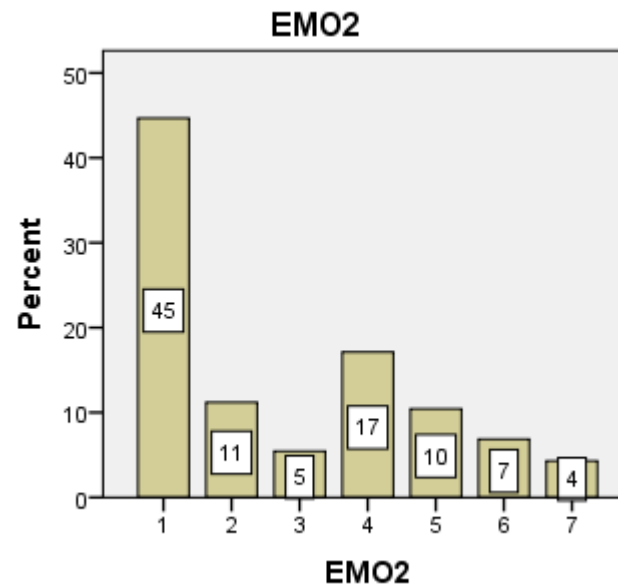
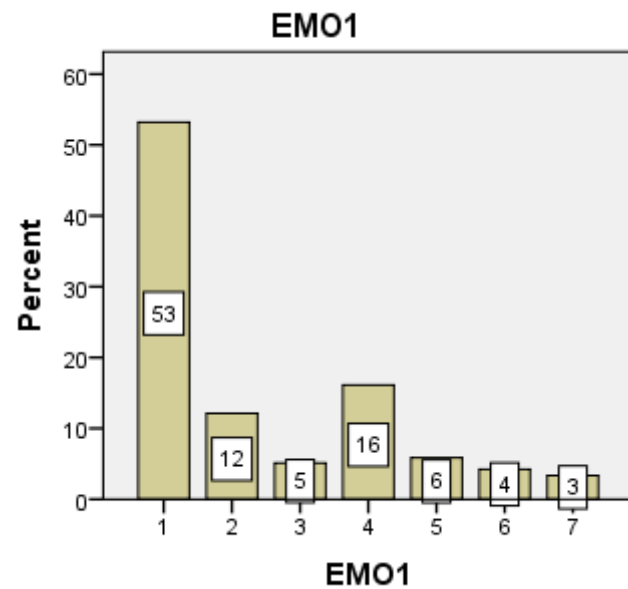


# Descriptive overview of responses: Extrinsic materialistic outcome

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
EMO1	I might receive monetary rewards (e.g. bonus, conference trips, promotion points, etc.) in return for using the methodology.
EMO2	Using the methodology might help me to acquire monetary incentives.
EMO3	If I use the methodology I might be able to get monetary rewards.

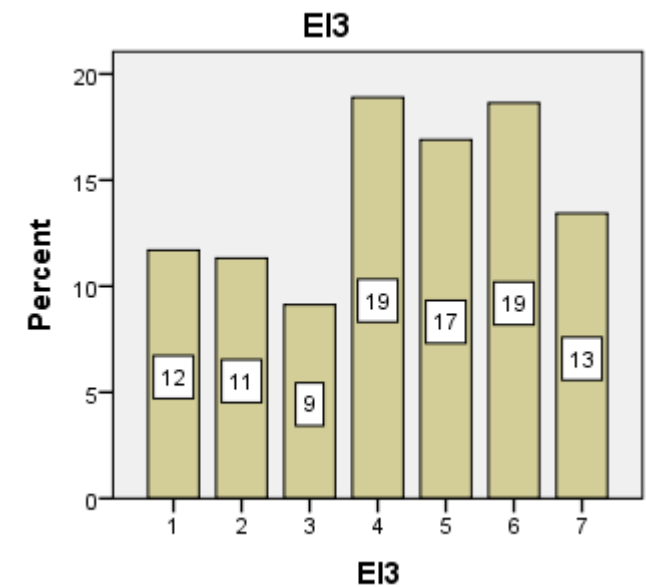
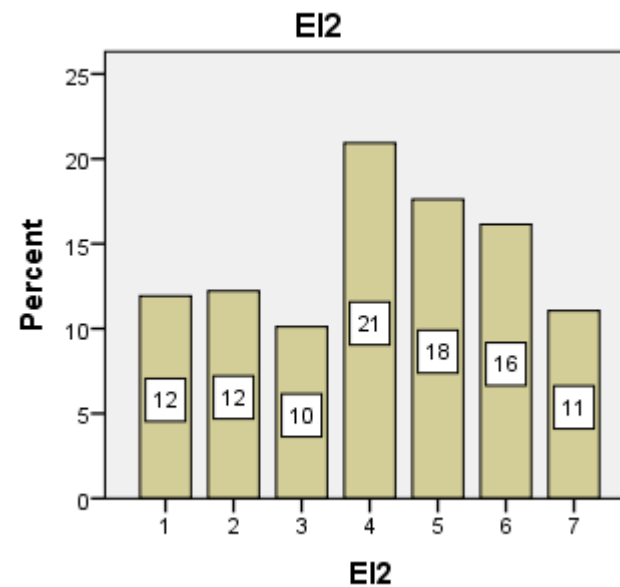
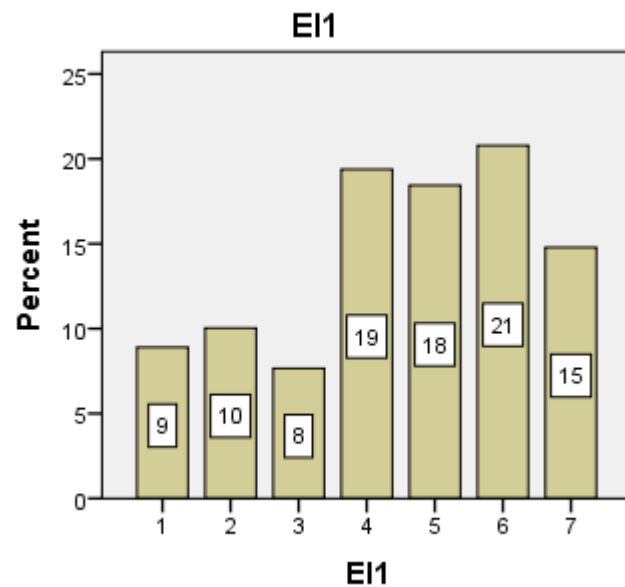


# Descriptive overview of responses: Expert influence

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
EI1	To make sure if the methodology is right for me, I often consult others who have considerable experience with the methodology.
EI2	I often consult experts who are knowledgeable in the use of the methodology before I decide using it.
EI3	I frequently gather information from experts who are knowledgeable in the use of the methodology before I decide to use it.

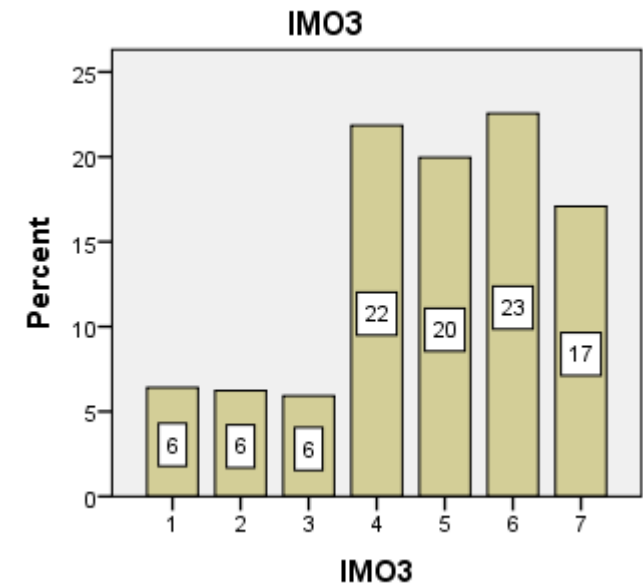
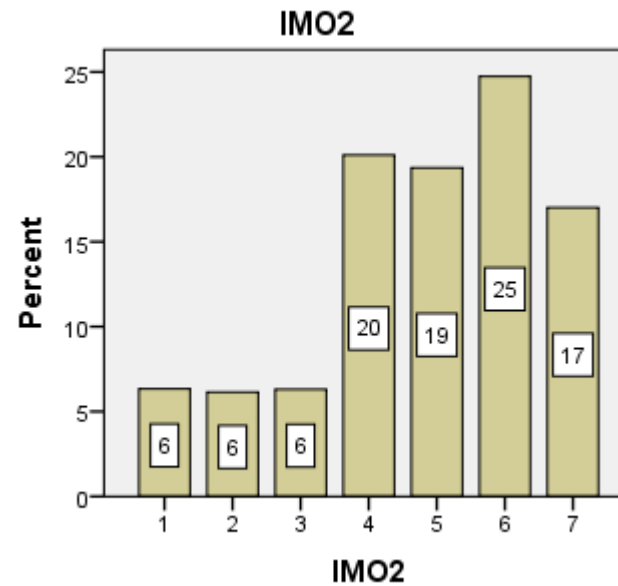
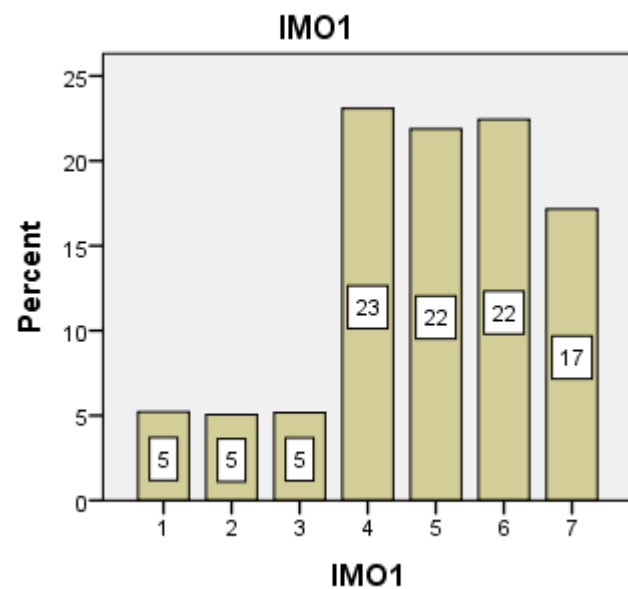


## Descriptive overview of responses: Intrinsic materialistic outcome

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
IMO1	By using the methodology I am able to build a high profile in my organization.
IMO2	Because of my use of the methodology, others in my organization see me as a more valuable employee.
IMO3	Using the methodology improves my image within the organization.

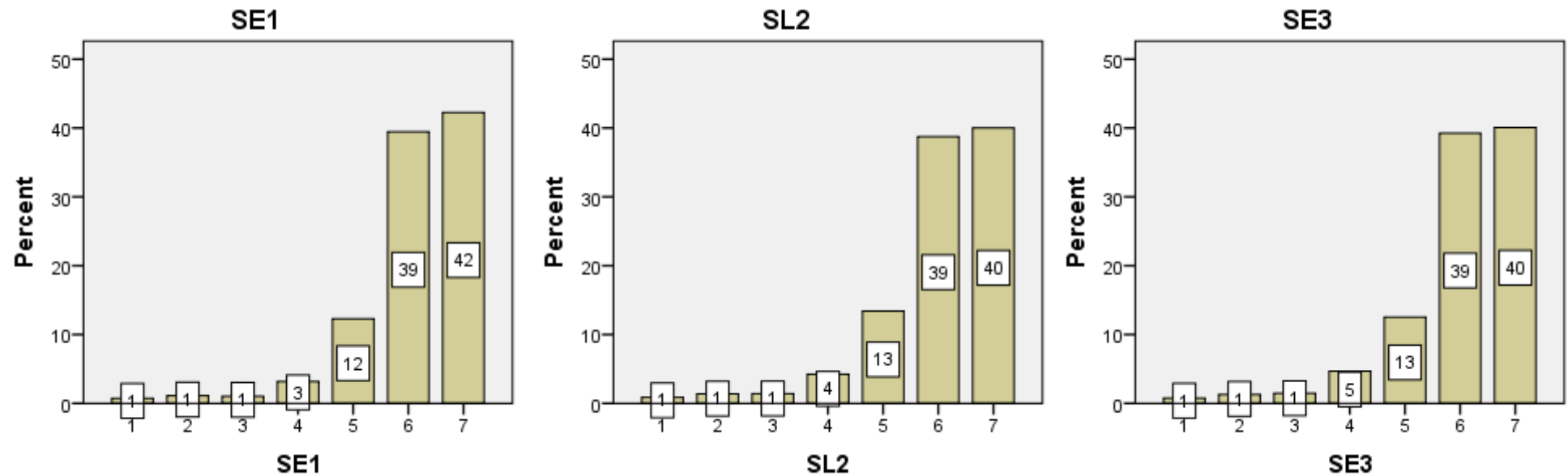


# Descriptive overview of responses: Self-efficacy

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
I have the necessary _____ to use the methodology	
SE1	skills
SE2	knowledge
SE3	competencies

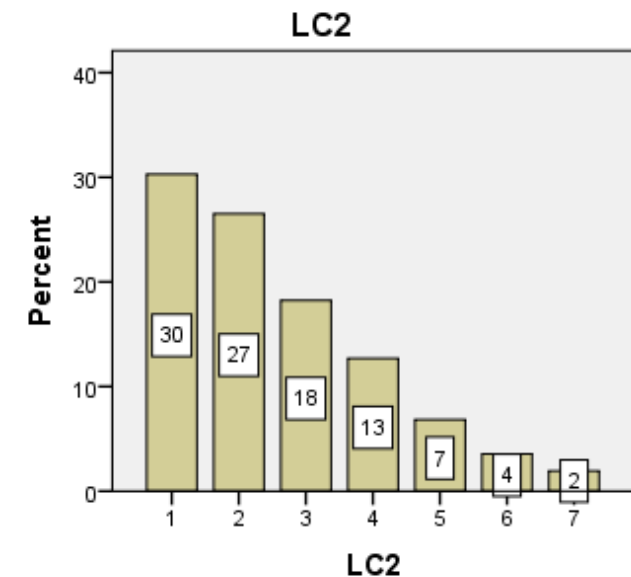
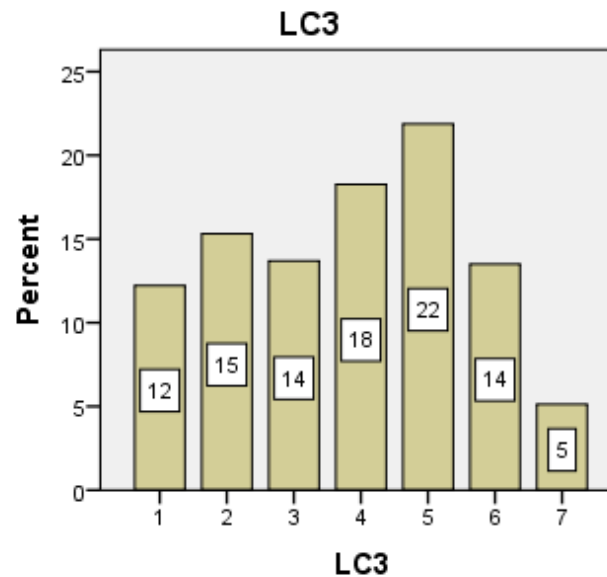
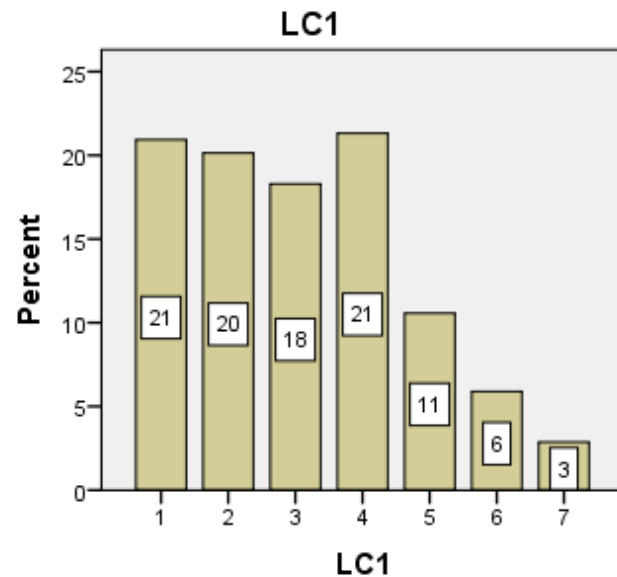


# Descriptive overview of responses: Learning costs

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
LC1	Learning to use the methodology would take time.
LC2	It would take time to “get up to speed” with the methodology.
LC3	It would take too long to learn how to use the methodology to make it worth the effort.

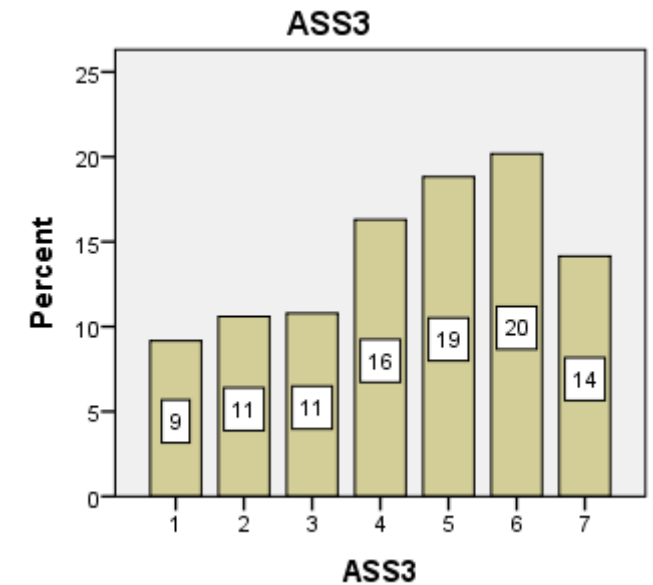
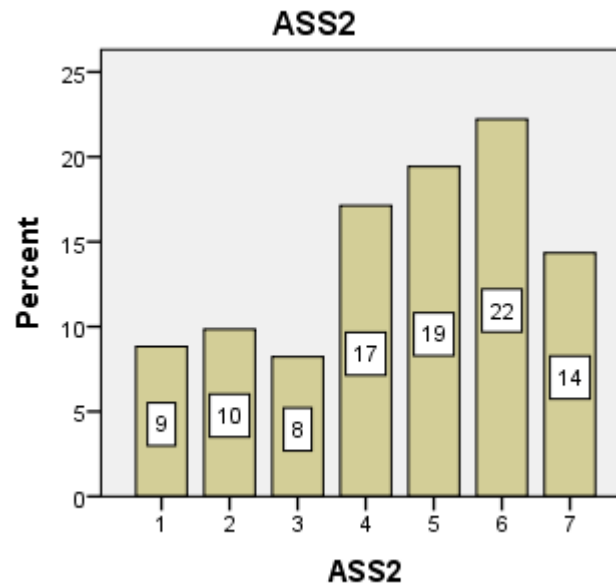
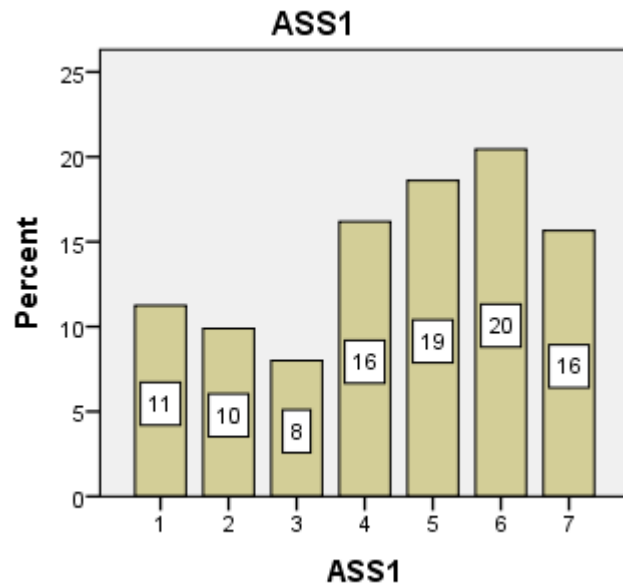


# Descriptive overview of responses: Assistance

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
ASS1	A specific person or group (e.g. support, project management office) would be available for assistance with difficulties related to the methodology.
ASS2	I expect to get the help I need in using the methodology.
ASS3	It would be easy for me to get assistance when I am having trouble using the methodology.



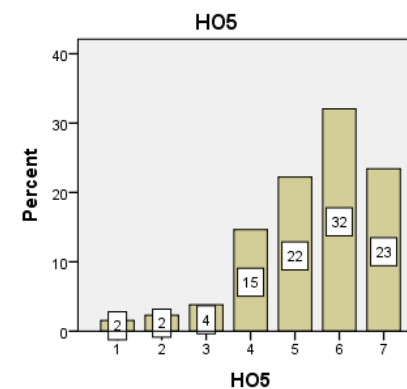
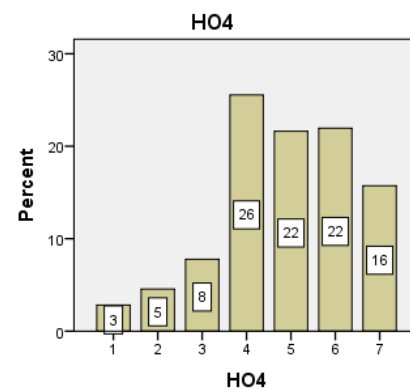
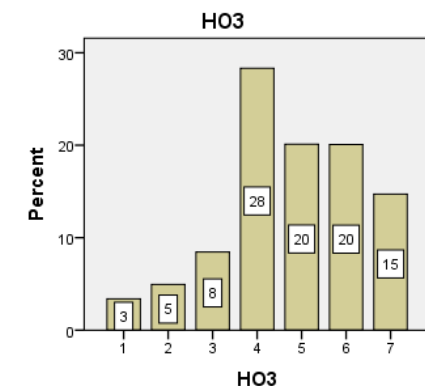
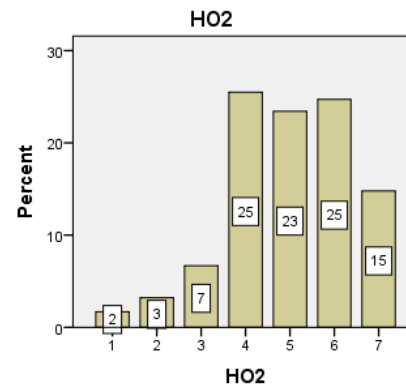
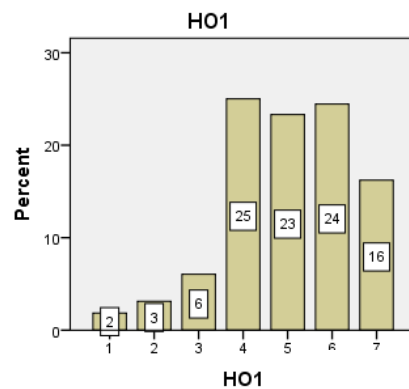


# Descriptive overview of responses: Hedonic outcome

Note:

- Y axis: Percentage of respondents
- X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
Using the methodology....	
HO1	... is enjoyable.
HO2	... is pleasant.
HO3	... is something I love to do.
HO4	... is exciting.
HO5	... is interesting.

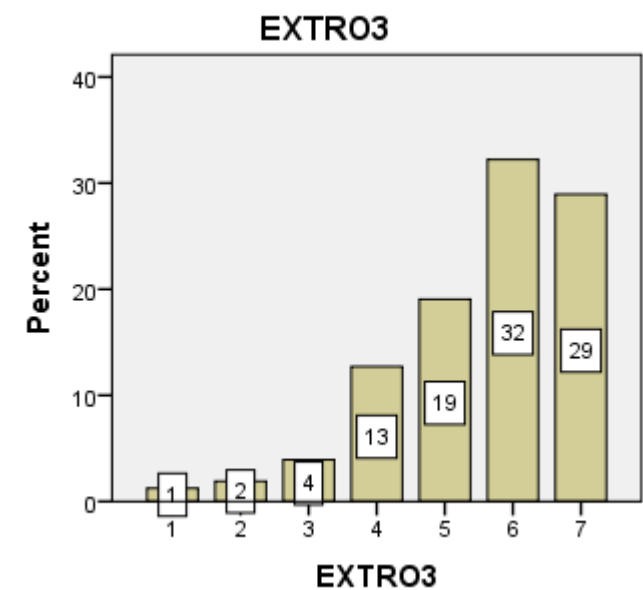
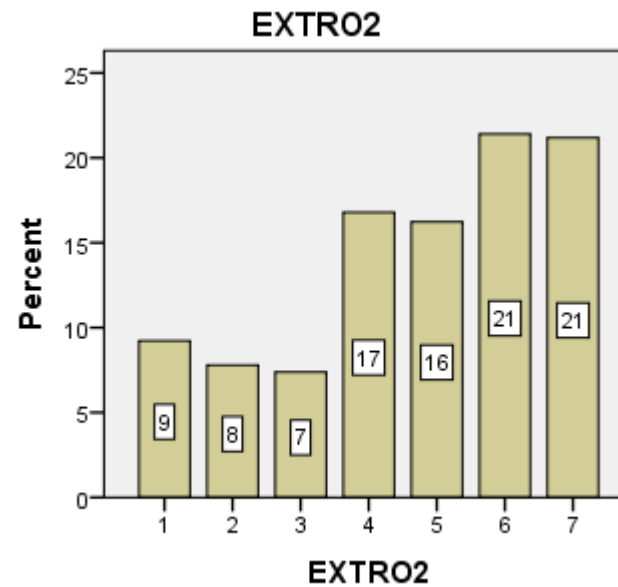
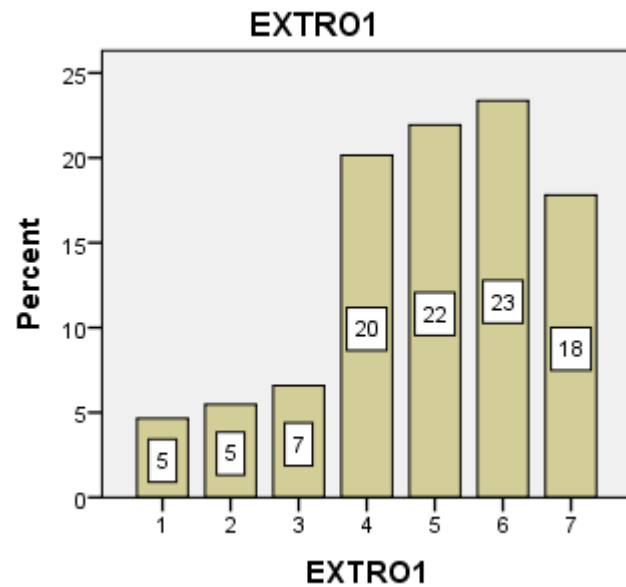


# Descriptive overview of responses: Extraversion

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
EXTR01	I like to win, even if the activity isn't very important.
EXTR02	I would like to attain the highest position in an organization someday.
EXTR03	I am always looking for opportunities to start new projects.

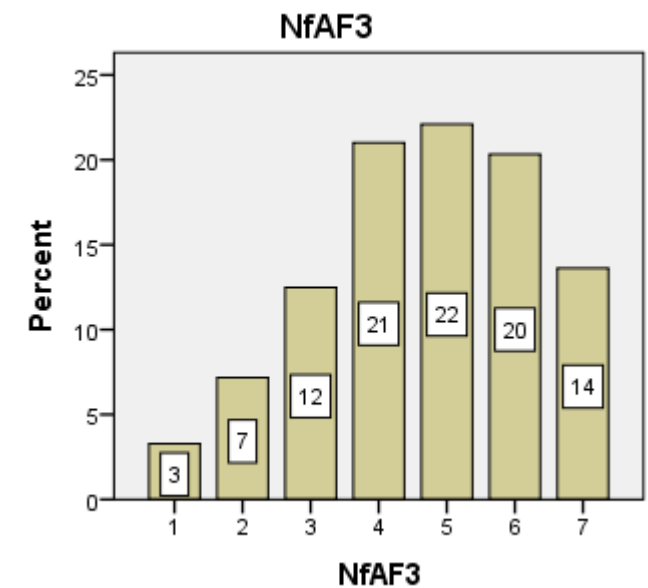
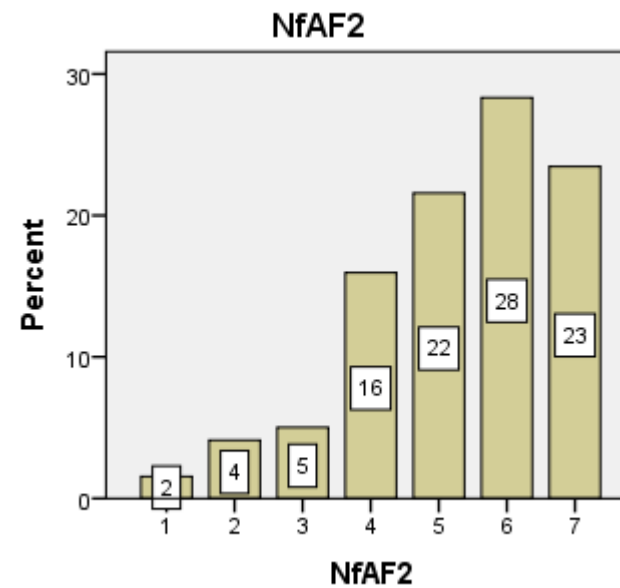
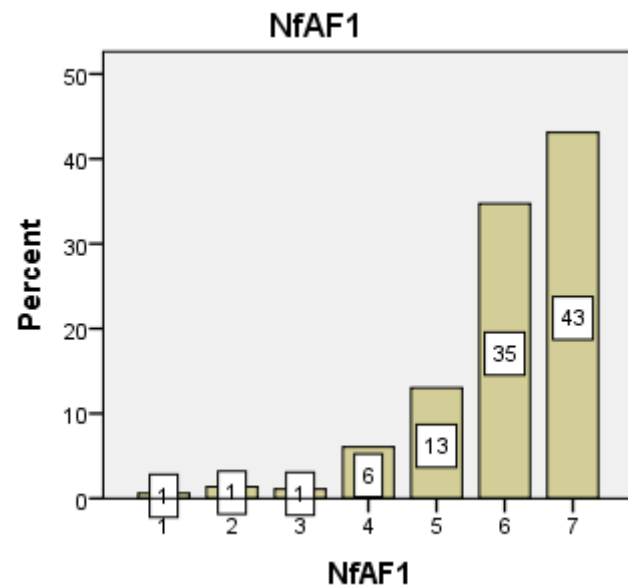


# Descriptive overview of responses: Need for affiliation

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
nfAF1	I like to make a effort to get along with my colleagues.
nfAF2	I like to talk to other colleagues about non-work related matters.
nfAF3	I like to spend a lot of time talking to colleagues.

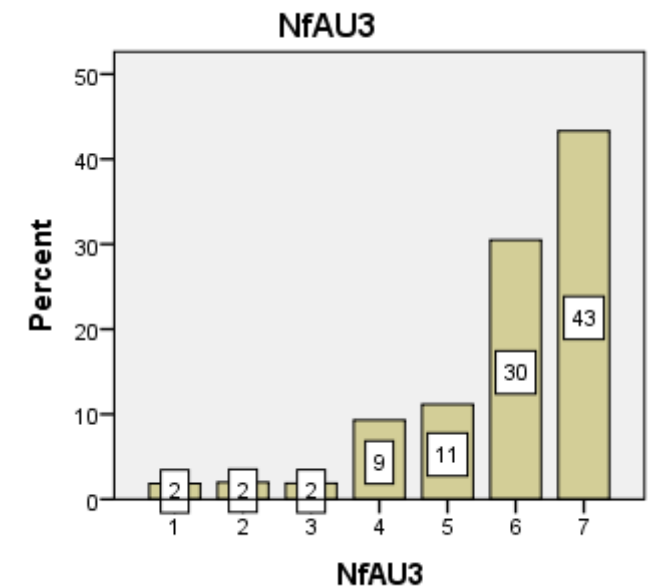
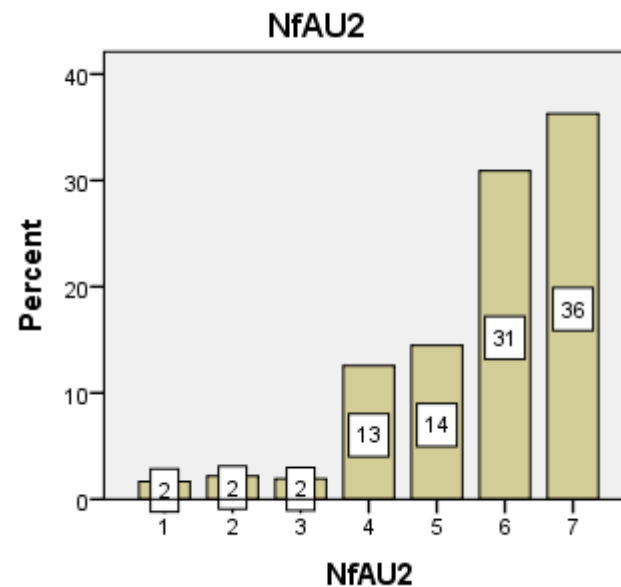
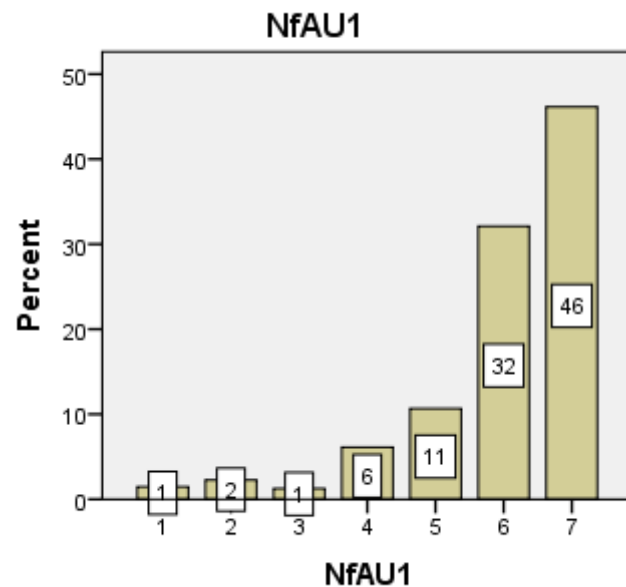


# Descriptive overview of responses: Need for autonomy

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
nfAU1	I like to make my own decisions.
nfAU2	I like to be my own boss.
nfAU3	I like to be my own boss in my work projects.

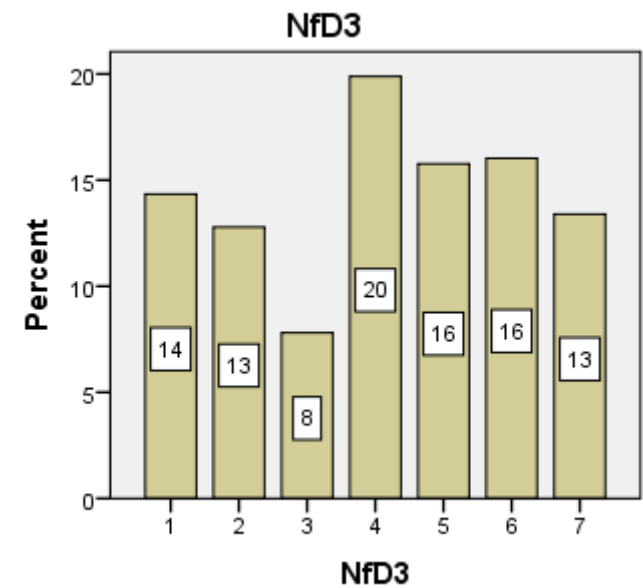
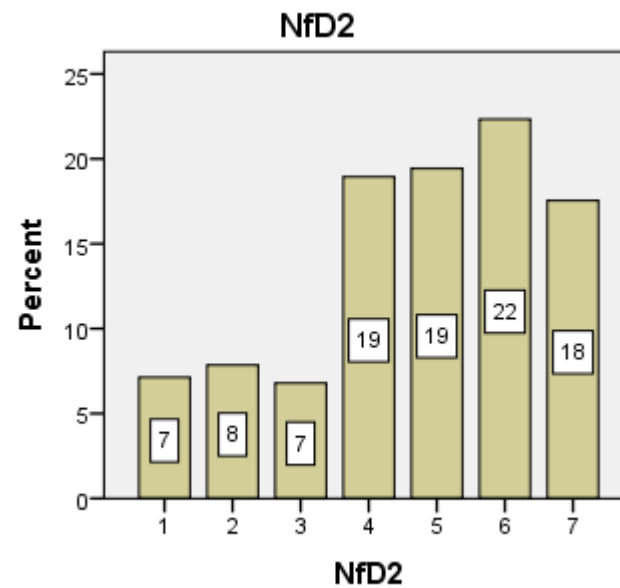
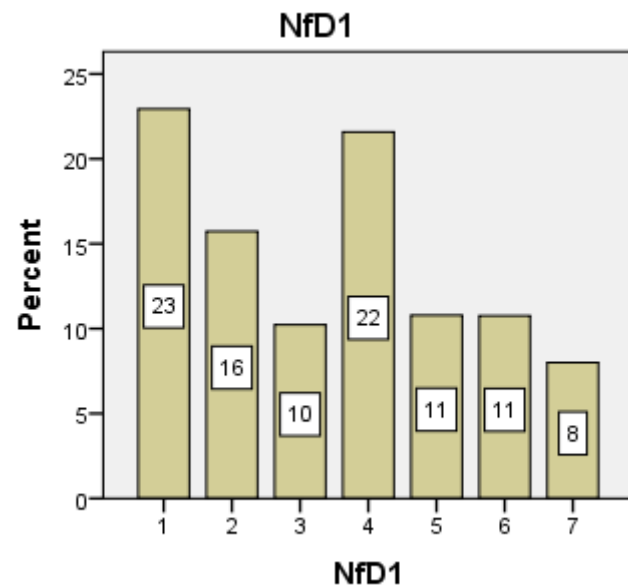


# Descriptive overview of responses: Need for blame avoidance

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
nfD1	I like to ensure that I am not held responsible for mistakes/problems.
nfD2	I like to be able to defend myself against criticism.
nfD3	I want to be always able to defend myself against being made held responsible for problems.

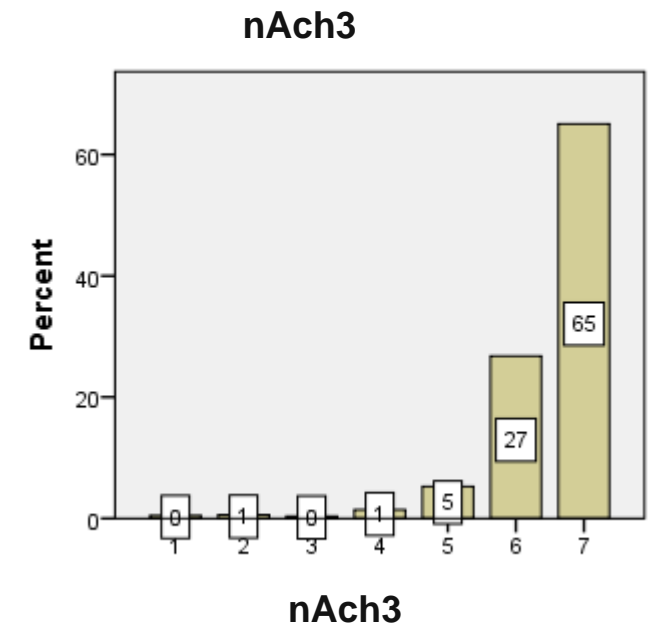
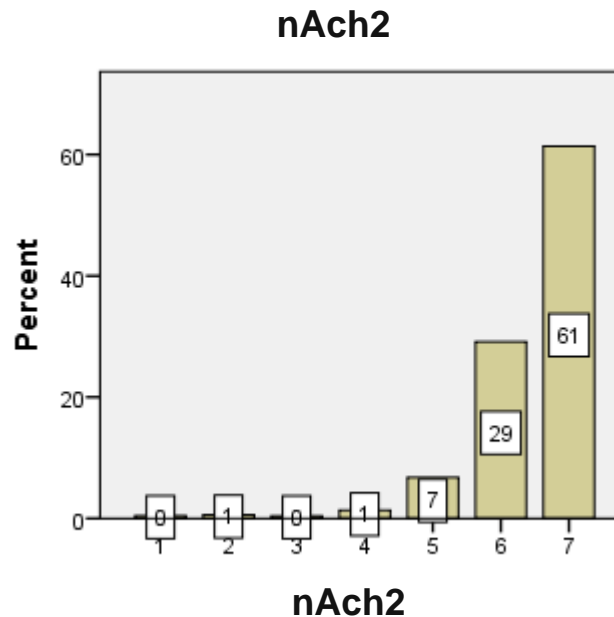
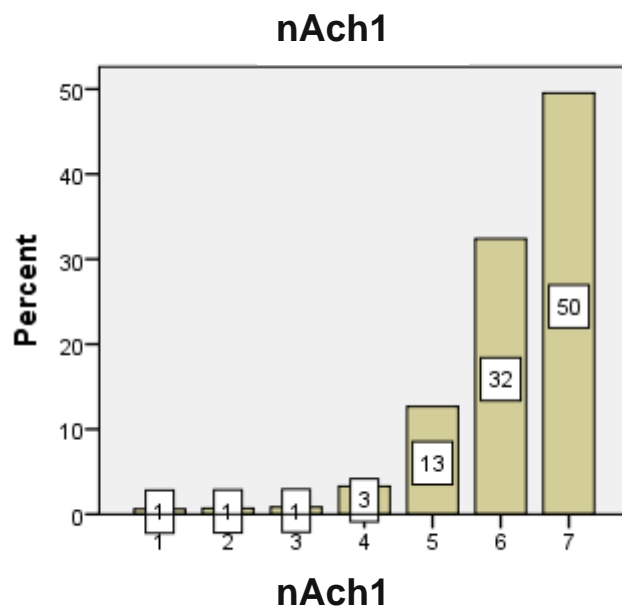


# Descriptive overview of responses: Need for achievement

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
nAch1	I like to try very hard to improve on my previous work performance.
nAch2	I like trying to perform my best at work.
nAch3	I like to do the best job possible.

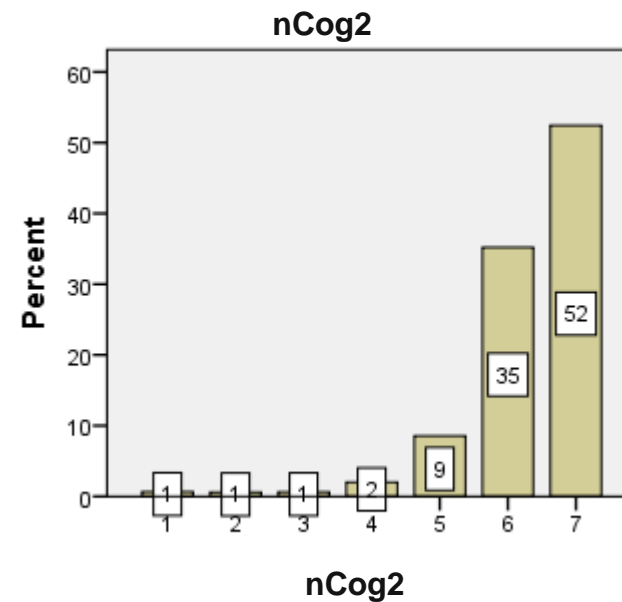
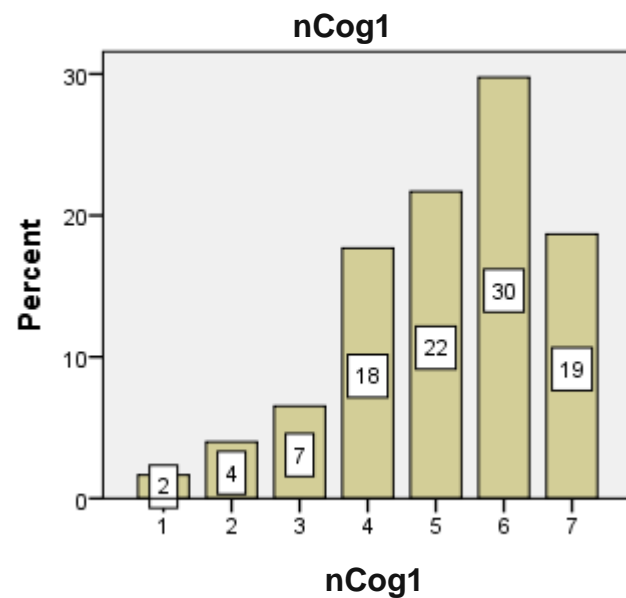


## Descriptive overview of responses: Need for cognition

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
nCog1	I like to deliberate about issues even when they do not affect me personally.
nCog2	I like activities that challenge my thinking abilities.

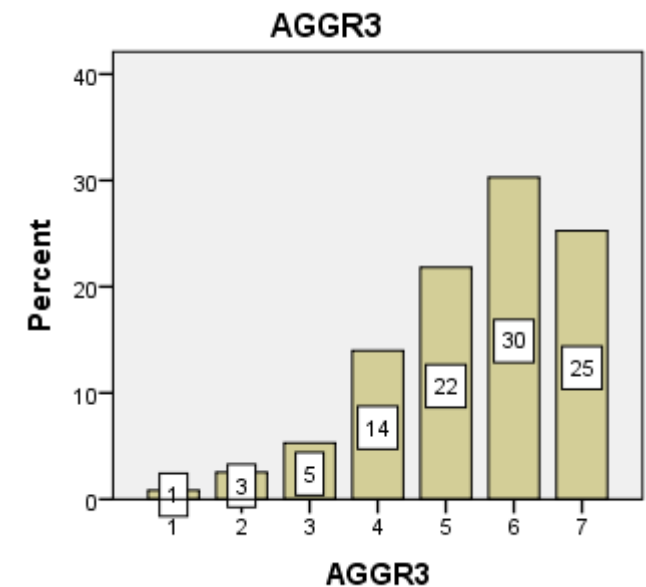
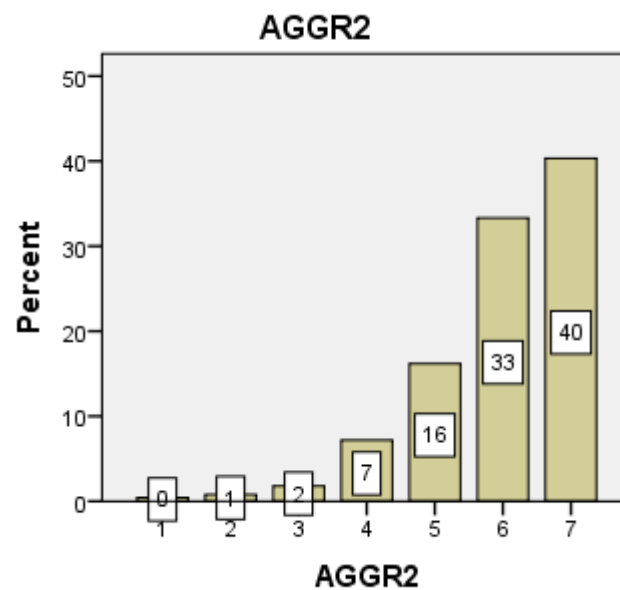
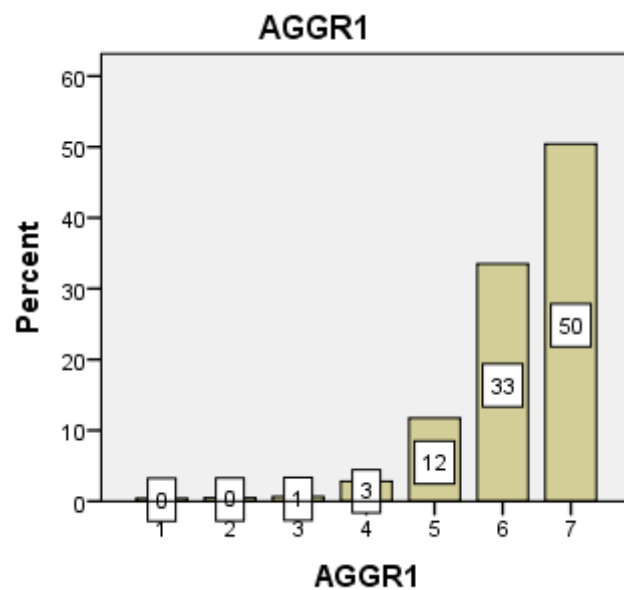


# Descriptive overview of responses: Agreeableness

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
I believe in....	
AGGR1	.... establishing good rapport with my peers.
AGGR2	.... in maintaining harmonious relationships with my peers.
AGGR3	.... in the importance of achieving agreement with my peers before I make decisions.



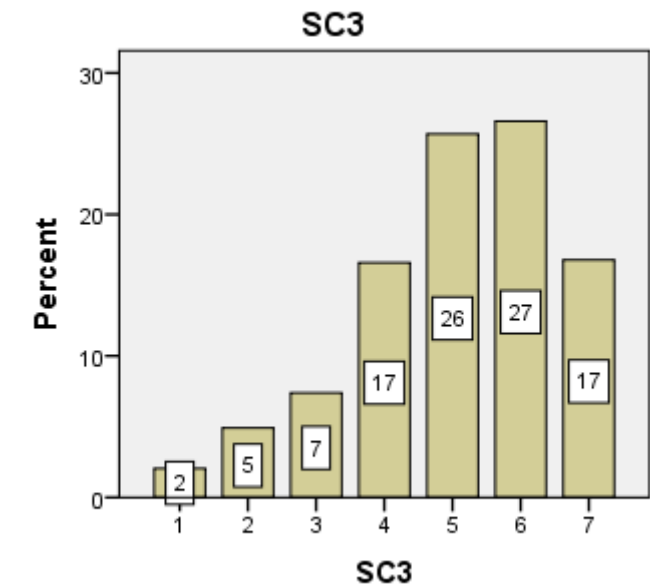
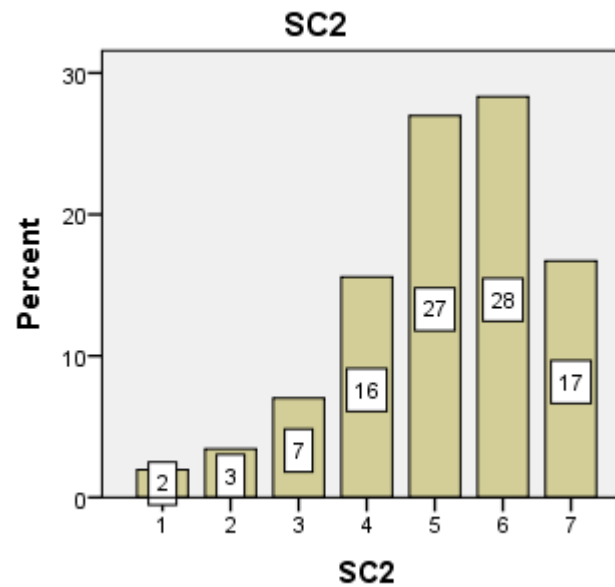
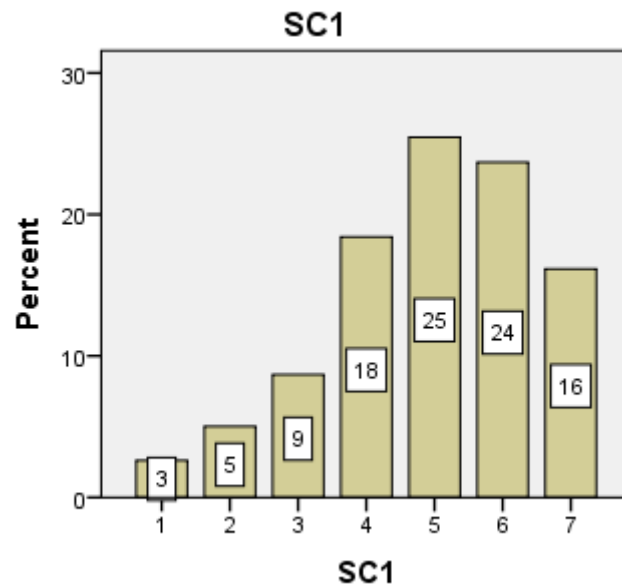


# Descriptive overview of responses: Sunk costs

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
SC1	A lot of energy, time, and effort have already gone into mastering this methodology.
SC2	Overall, I have already invested a lot of effort in this methodology.
SC3	All things considered, I have already put a lot into becoming good at using this methodology.

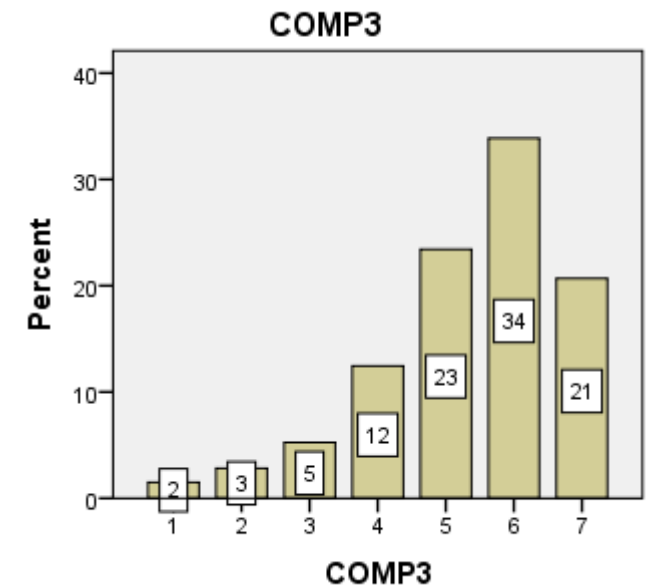
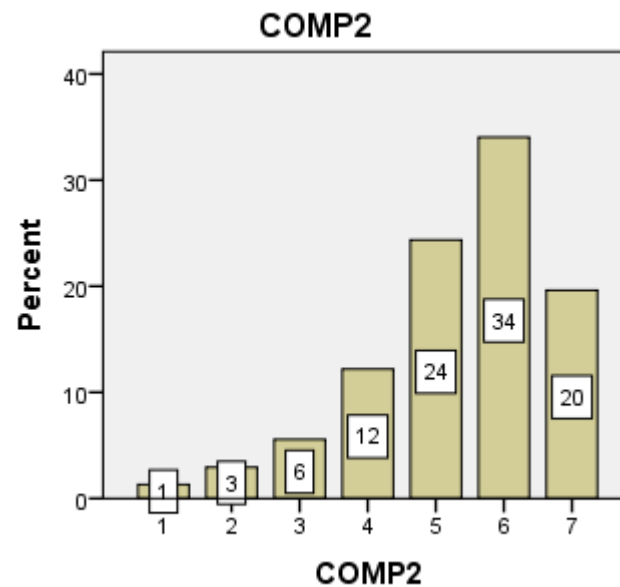
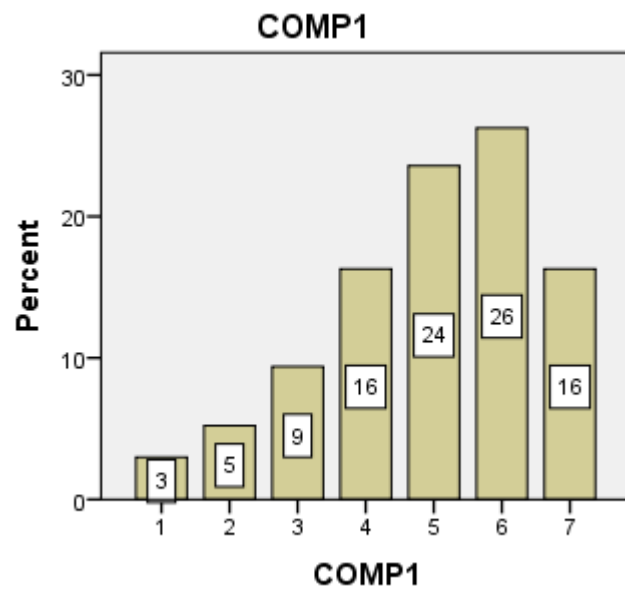


# Descriptive overview of responses: Compatibility

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
COMP1	Using the methodology is compatible with all aspects of my work.
COMP2	Using the methodology fits into my work style.
COMP3	I think that using the methodology fits well with the way I like to work.

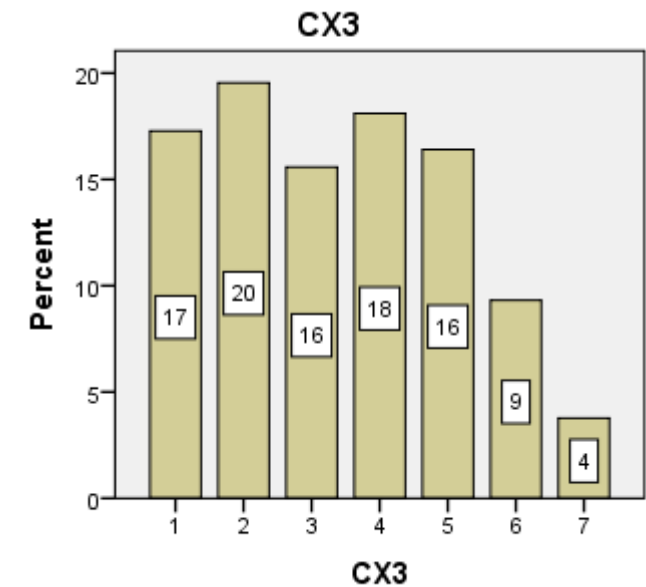
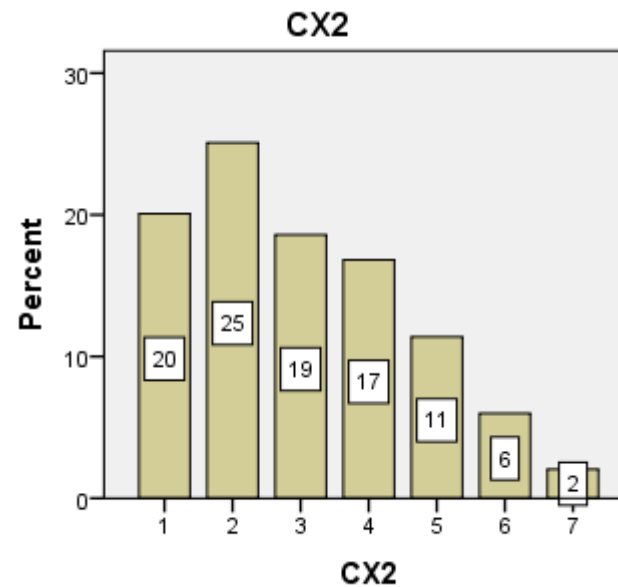
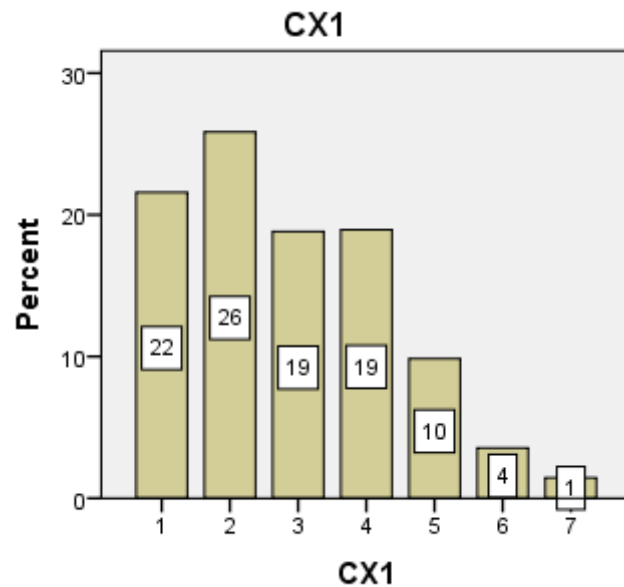


# Descriptive overview of responses: Complexity

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
CX1	I feel the methodology is difficult to use because of its <b>complexity</b> .
CX2	I feel the methodology is quite <b>complicated</b> to master.
CX3	I feel the methodology is <b>complex</b> .

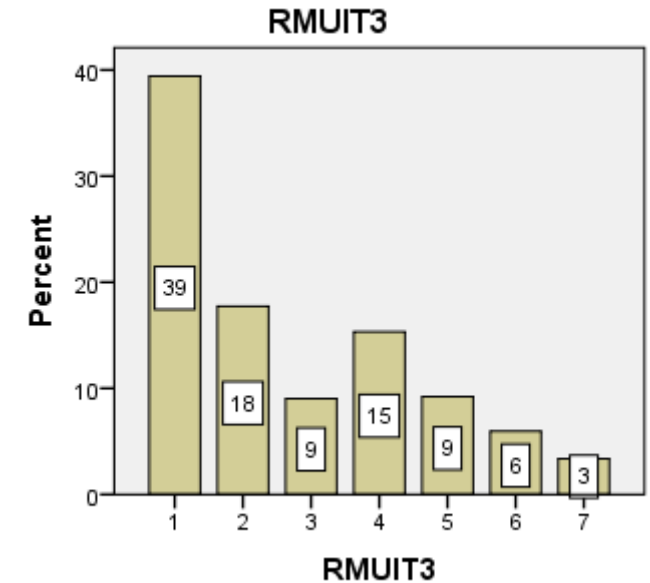
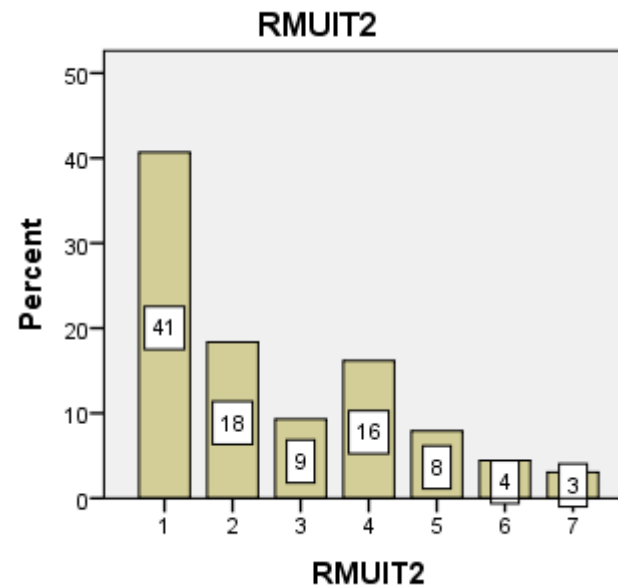
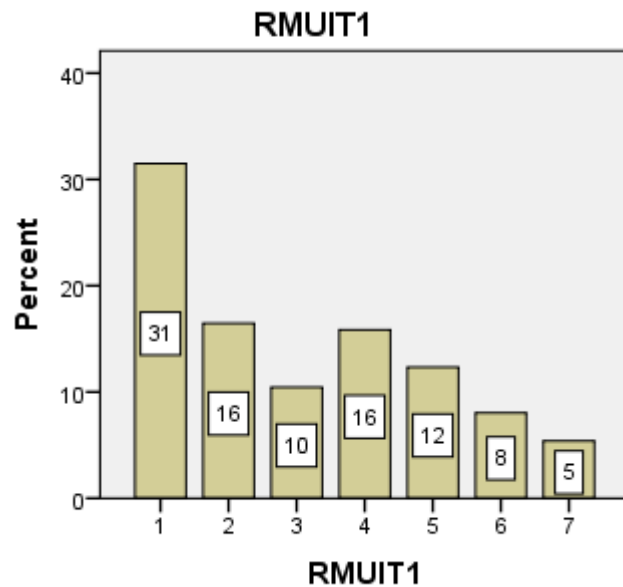


# Descriptive overview of responses: Rational-materialistic user influence tactic

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
<b>Organizational representatives.....</b>	
RMUIT1	...explained how using the methodology could help my career.
RMUIT2	...explained how using the methodology could help me attain a promotion and/or bonus.
RMUIT3	...provided a clear picture of the material benefits I could gain from using the methodology (e.g. get perks, enhance my reputation).

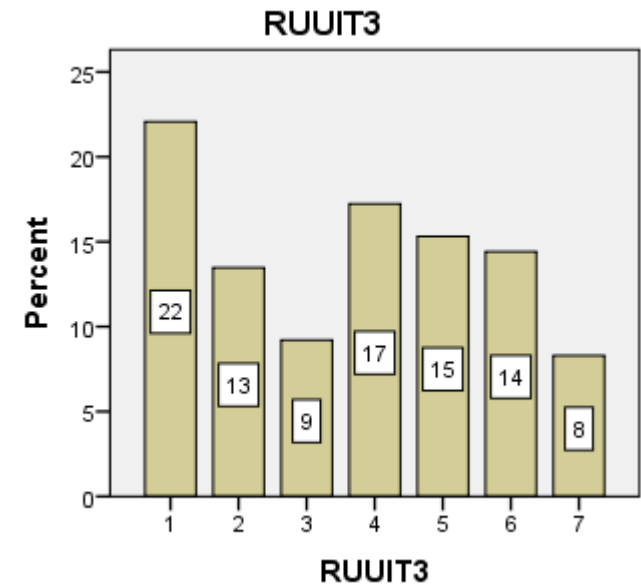
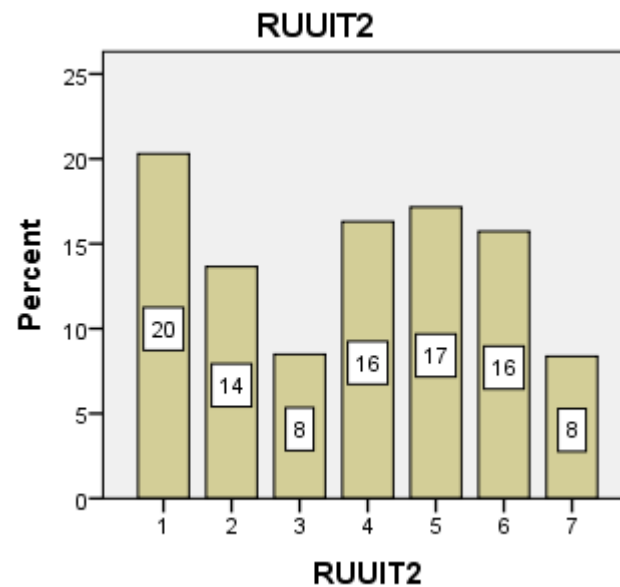
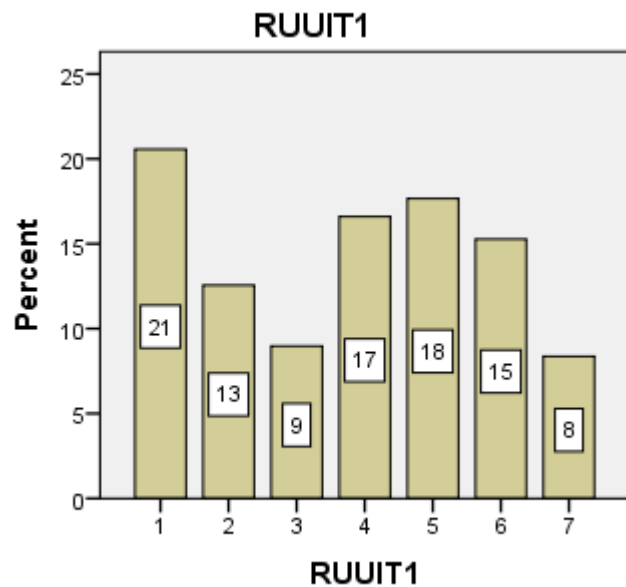


# Descriptive overview of responses: Rational-utilitarian user influence tactic

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
Organizational representatives.....	
RUUIT1	...explained clearly why using the methodology is necessary to attain a task objective.
RUUIT2	...explained why using the methodology would be practical and/or cost effective.
RUUIT3	...provided information or evidence to show that using the methodology is likely to make me more successful in my work.

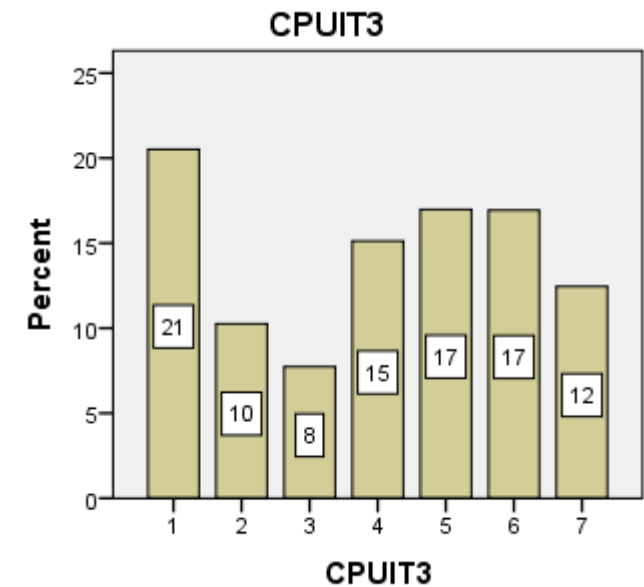
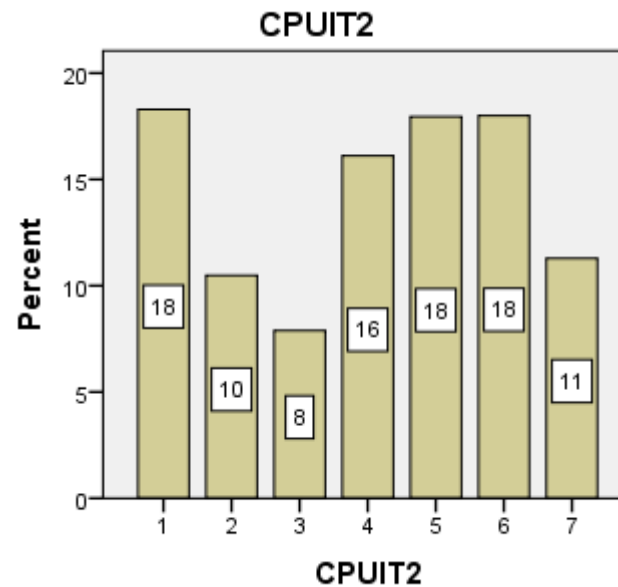
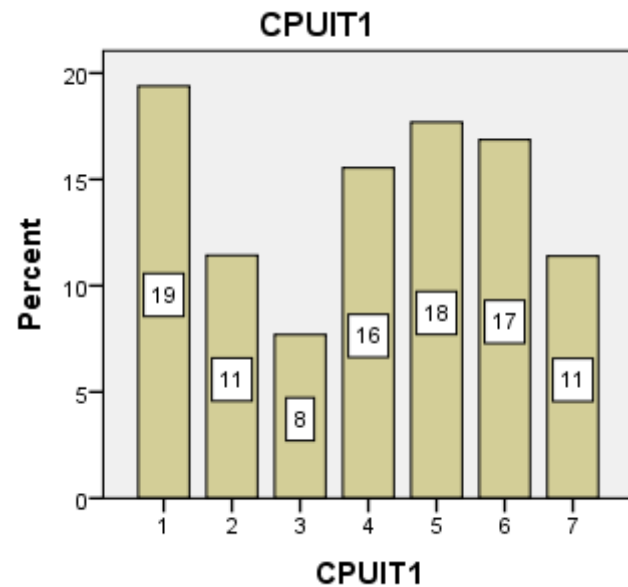


# Descriptive overview of responses: Cooperative user influence tactic

Note:

- Y axis: Percentage of respondents
- X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
Organizational representatives.....	
CPUIT1	...consulted with me to get my ideas about the methodology that he/she wants me to use.
CPUIT2	...encouraged me to express any concerns I may have about the methodology he/she wants me to use.
CPUIT3	...invited me to suggest ways to improve an early version of the methodology that he/she wants me to use.

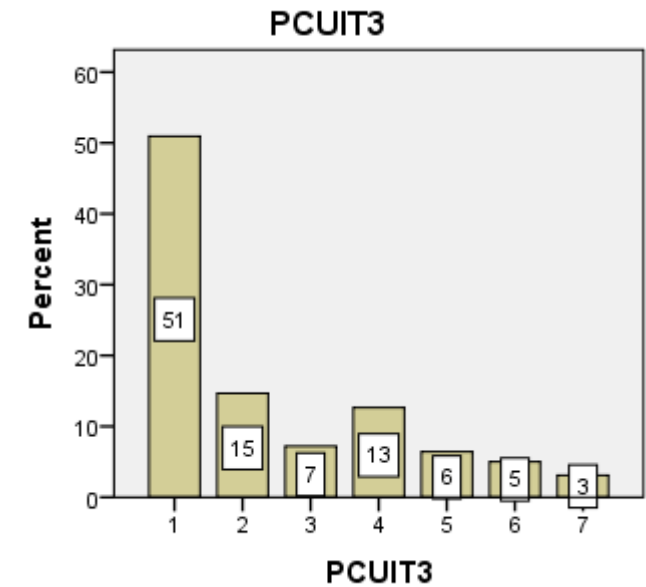
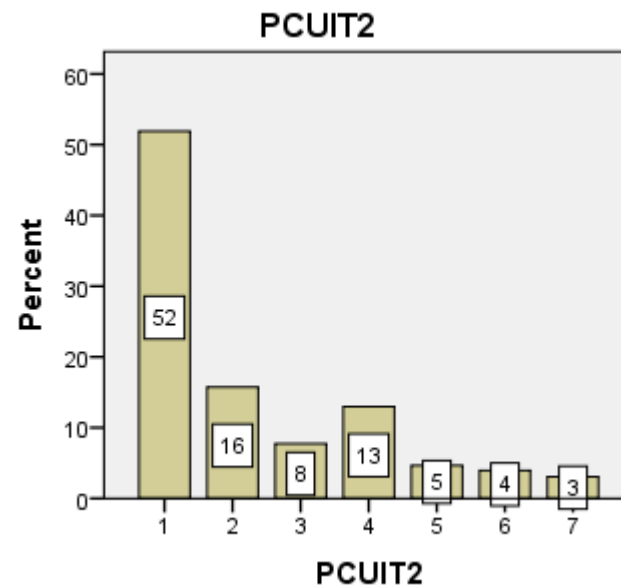
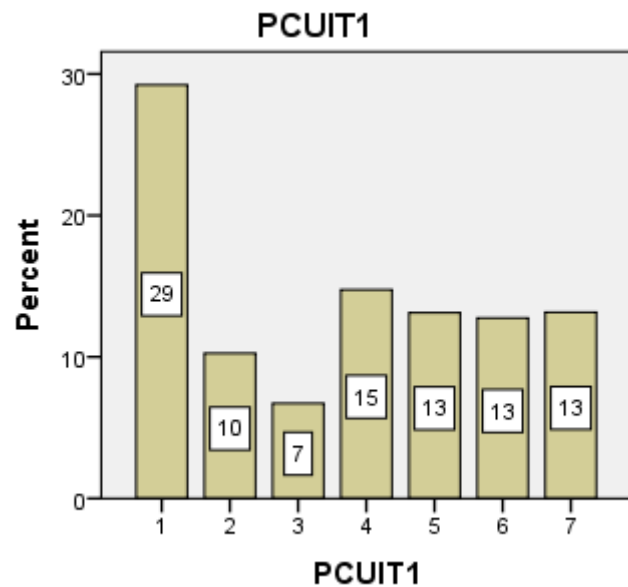


# Descriptive overview of responses: Power-coercive user influence tactic

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
Organizational representatives.....	
PCUIT1	...demanded that I use the methodology.
PCUIT2	...used threats or warnings when trying to get me to use the methodology.
PCUIT3	...tried to pressure me to use the methodology.

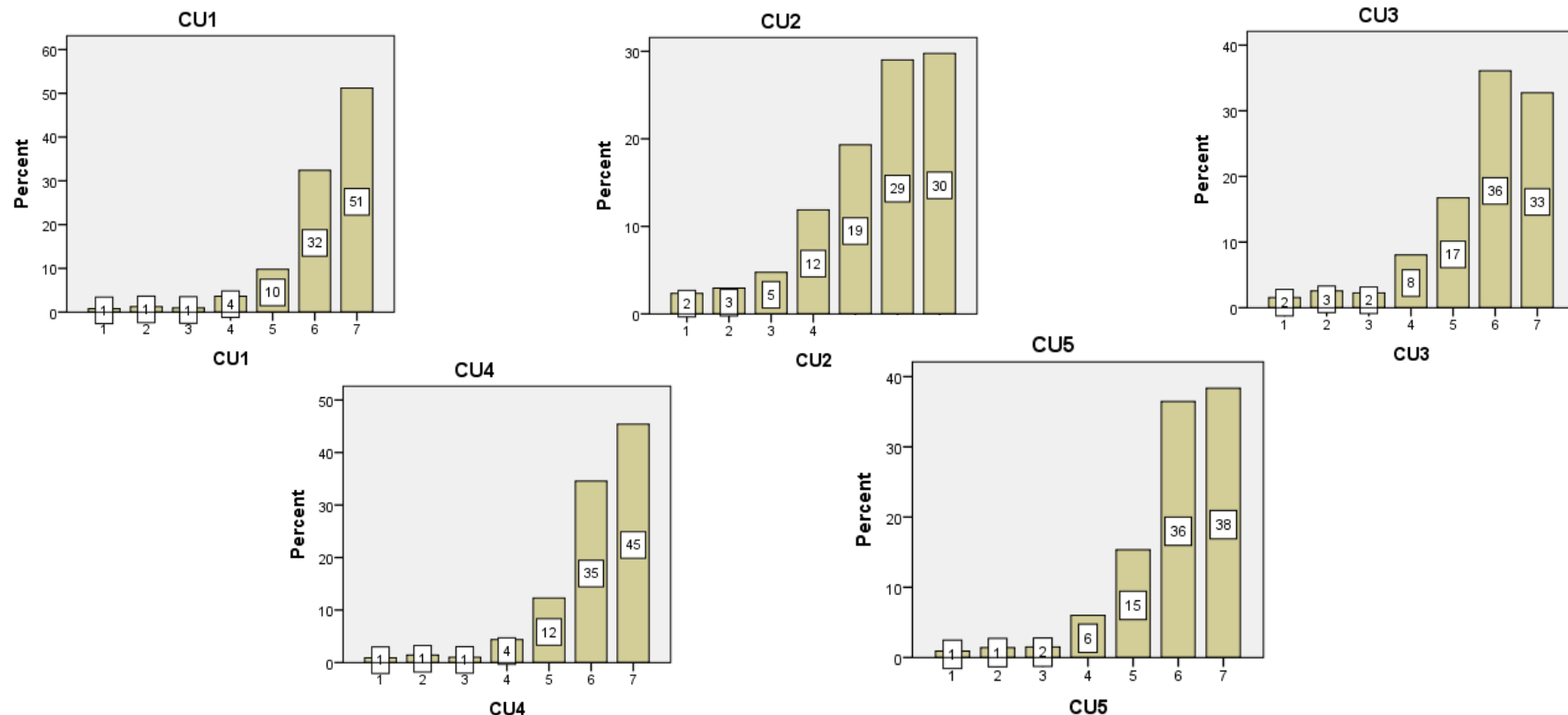


# Descriptive overview of responses: Committed use

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
CU1	When using the methodology I try to get the best out of it.
CU2	I try to make an extra effort to use the methodology right.
CU3	When using the methodology I try not to give up easily even when faced with problems.
CU4	I try to use the methodology in the best possible way.
CU5	Even when faced with problems, I try to get the best out of the methodology.



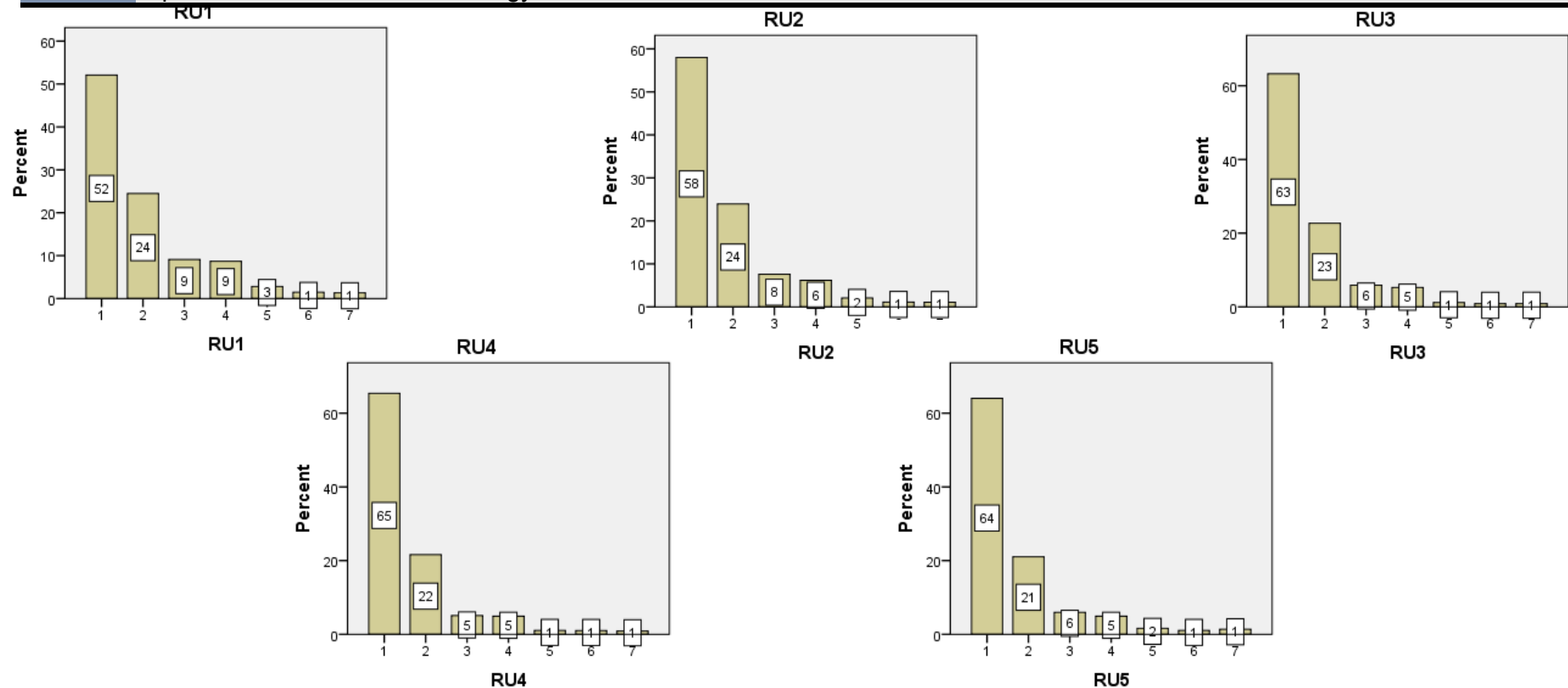


# Descriptive overview of responses: Resistant use

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
RU1	Whenever I have a choice, I don't use the methodology.
RU2	I avoid using the methodology whenever possible.
RU3	Whenever possible, I try to argue against using the methodology.
RU4	Whenever possible, I advise <i>against</i> using the methodology.
RU5	I prefer not to use the methodology.

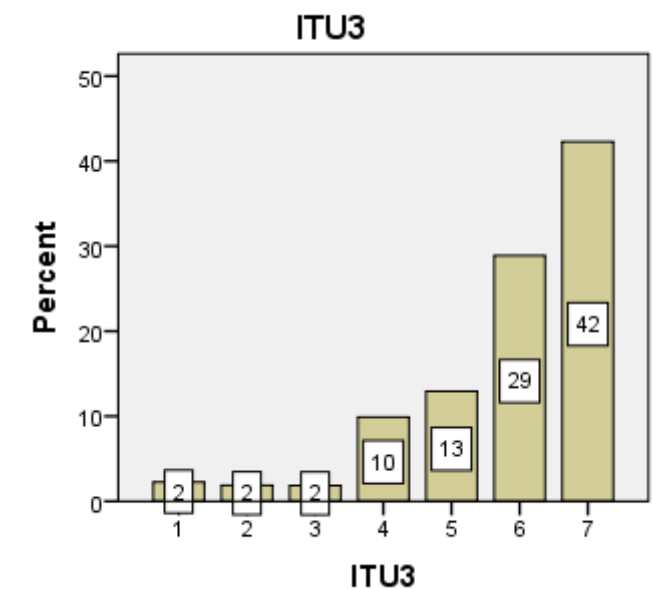
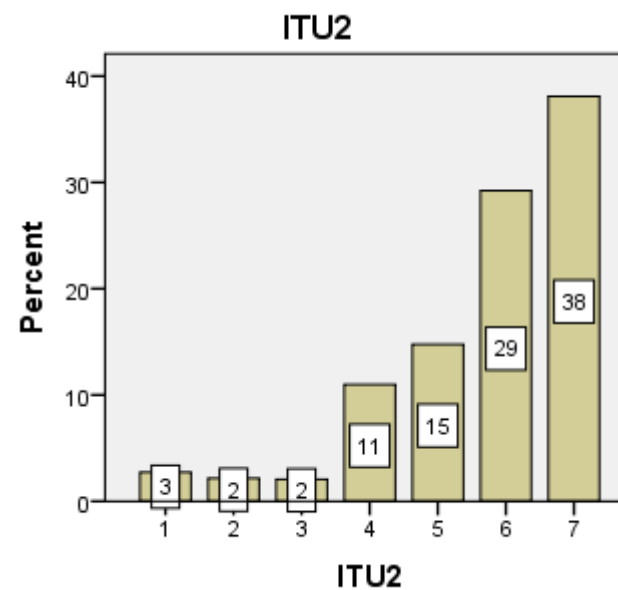
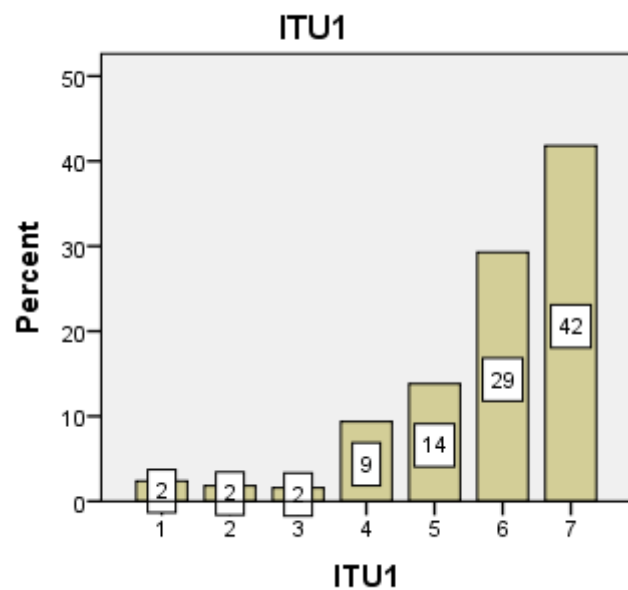


# Descriptive overview of responses: Intention to use

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
ITU1	I intend to use the methodology at the next opportunity.
ITU2	I predict I would use the methodology at the next opportunity.
ITU3	I plan to use the methodology at the next opportunity.

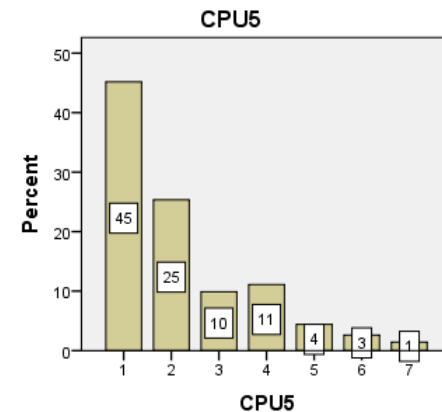
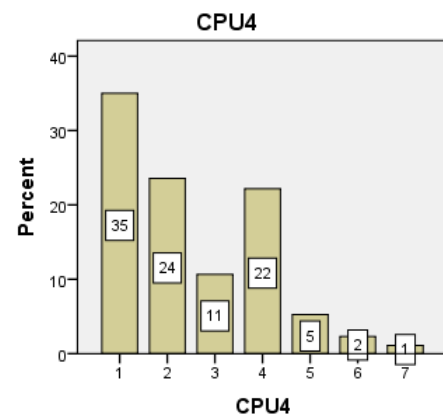
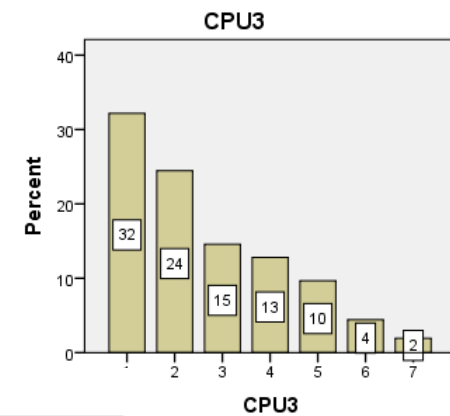
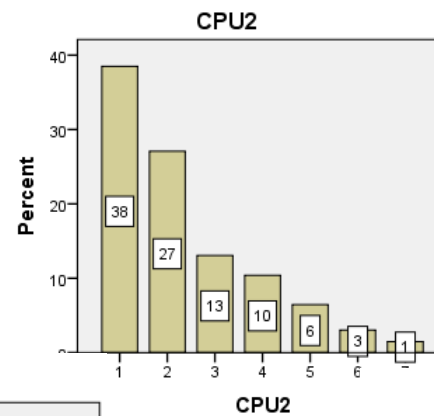
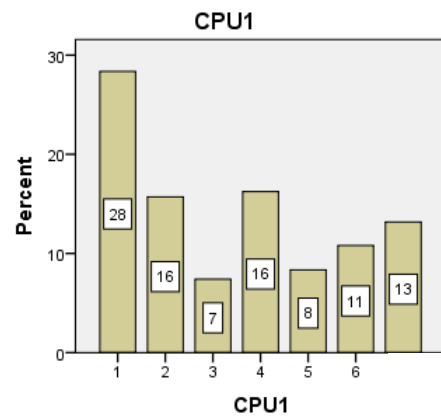


# Descriptive overview of responses: Compliant use

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
CPU1	I am not concerned about using the methodology.
CPU2	When using the methodology I just do the bare minimum.
CPU3	When using the methodology I just comply with the basic rules and instructions.
CPU4	When using the methodology i don't exert particularly.
CPU5	When using the methodology I just do what I am told to do.

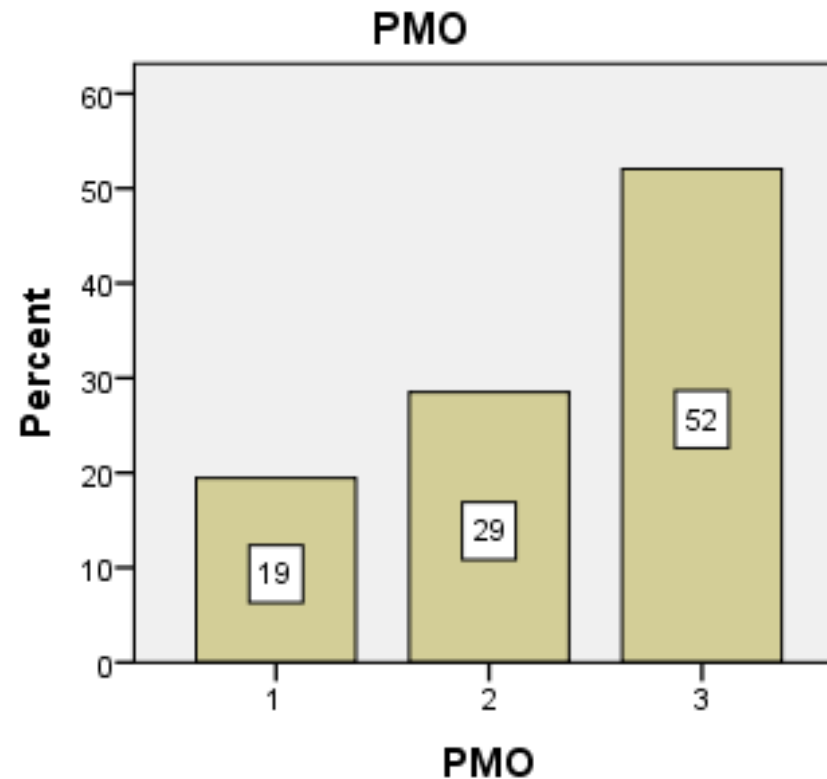


## Descriptive overview of responses: PMO maturity

Note:

- ▶ Y axis: Percentage of respondents

Value on x axis	PMO type
1	Type A: Coaching, Training und Education, Support.
2	Type B: Type A and Administration, collecting and reporting of project data, Analysis und Review.
3	Type C: Type B and Project/ Program Portfolio Management, overall project management, enforcement of project management standards.

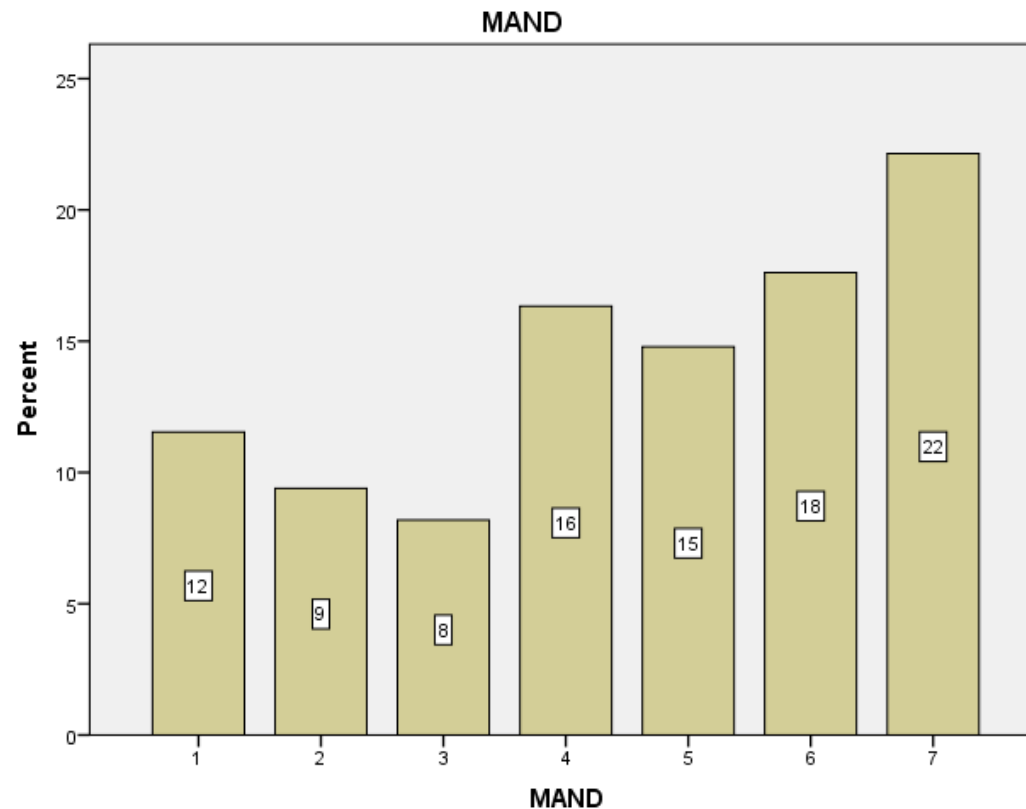


## Descriptive overview of responses: Mandatory methodology

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Strongly disagree (1) and Strongly agree (7)

Code	Question
MAND	The use of the methodology is mandatory in my organization (in which the project was executed).

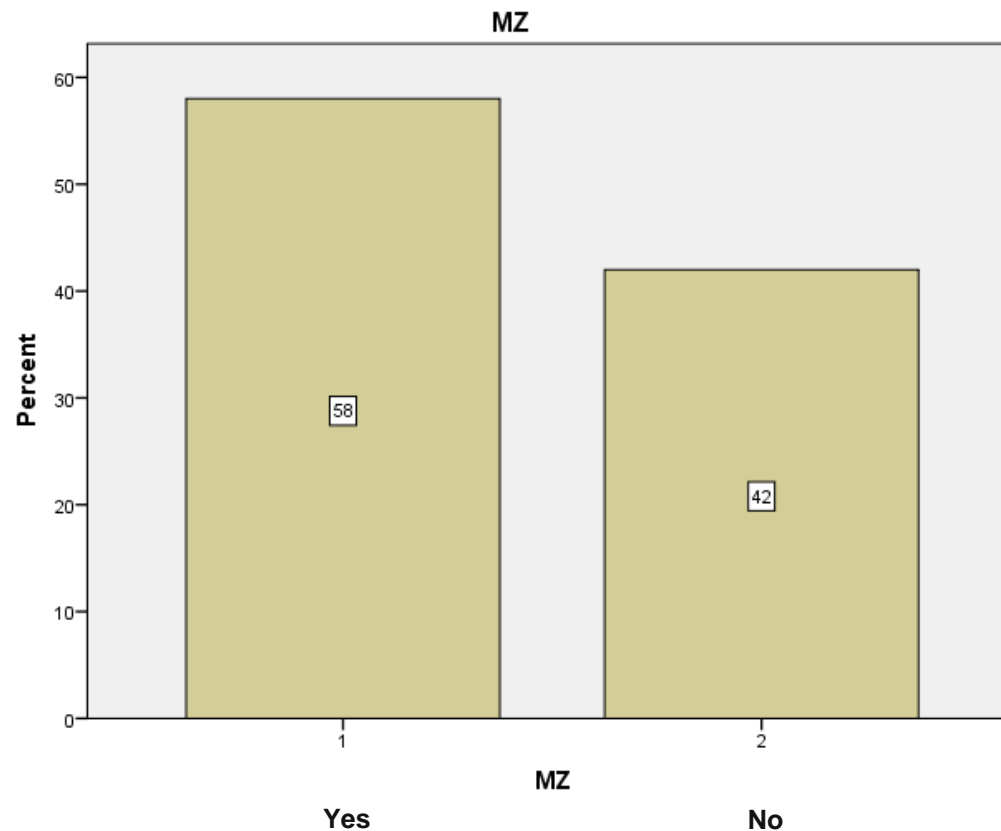


## Descriptive overview of responses: Methodology certification

Note:

- ▶ Y axis: Percentage of respondents
- ▶ X axis: Yes (1) and No (2)

Code	Question
MZ	Do you have any professional certification regarding the specific methodology used?



## Demographics: Profile of the Respondents, Projects, and Organization (1/5)

Project type		
	Frequency	Percent
IT-Hardware. Machine related (Development. Implementation. Maintenance. Repair etc.)	317	12
Software related (Development. Implementation. Maintenance etc.)	1459	55
General techonology related	210	8
Organizational project	226	9
Administration project		
Research	30	1
Product development	134	5
Marketing. Communication. PR	30	1
Construction. Plant construction	145	6
Not specified	100	4
Total	2651	100

Primary role in the project		
	Frequency	Percent
Project manager	1837	69
Project team member	284	11
Project sponsor	38	1
Controlling	20	1
Program manager	262	10
Portfolio manager	54	2
Member of a project office / competence center project management	116	4
Other	40	2
Total	2651	100

## Demographics: Profile of the Respondents, Projects, and Organization (2/5)

Experience in use of the Methodology (no. of years)		
	Frequency	Percent
less than 1	64	2
1 - 5	1017	38
5 - 10	932	35
10 - 15	434	16
15 - 20	104	4
More than 20	72	3
Not specified	28	1
Total	2651	100

No of projects Methodology used in		
	Frequency	Percent
less than 5	850	32
5 - 10	626	24
10 - 20	496	19
20 - 30	249	9.4
30 - 40	98	4
More than 40	255	10
Not specified	77	3
Total	2651	100



## Demographics: Profile of the Respondents, Projects, and Organization (3/5)

Age (years)		
	Frequency	Percent
Less than 20	1	0.0
20 - 30	201	8
30 - 40	1025	39
40 - 50	938	35
50 - 60	399	15
More than 60	75	3
Not specified	12	1
Total	2651	100

Gender		
	Frequency	Percent
Male	2136	81
Female	515	19
Total	2651	100

Project manager certification		
	Frequency	Percent
Yes	1707	64
No	917	35
Not specified	27	1
Total	2651	100

## Demographics: Profile of the Respondents, Projects, and Organization (4/5)

Project management experience (in years)		
	Frequency	Percent
Less than 1	23	1
1 - 5	375	14
5 - 10	820	31
10 - 15	665	25
15 - 20	387	15
More than 20	361	14
Not specified	20	1
Total	2651	100

How many employees does your organization have <u>worldwide</u> ?		
	Frequency	Percent
Less than 500	665	25
500 -1000	125	5
1000 – 5000	432	16
5000 – 10000	197	7
10000 – 50000	473	18
More than 50000	588	22
Not specified	171	7
Total	2651	100

## Demographics: Profile of the Respondents, Projects, and Organization (5/5)

In which sector (in which the project was executed) does your organisation primarily operate?		
	Frequency	Percent
Automobile	99	4
Finance. Bank and Insurance	424	16
Transportation. Logistics and Warehousing	121	5
Wholesale/ Retail Trade	80	3
Agriculture. Forestry. Fishing and Hunting	8	0
Construction. Electrical Apparatus & Equipment. Machine and plant construction	178	7
Mining	9	0
Pharmaceutical. Chemical	106	4
Information and Communications technology	647	24
Professional services (e.g. consulting. advertisement)	268	10
Other non-professional services	9	0
Telecommunication	266	10
Education	55	2
Public services	132	5
Manufacturing	41	2
Electric. Gas & Sanitary Services	111	4
Other	97	4
Total	2651	100

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