Some Research on Agile Software Development

Robert Feldt
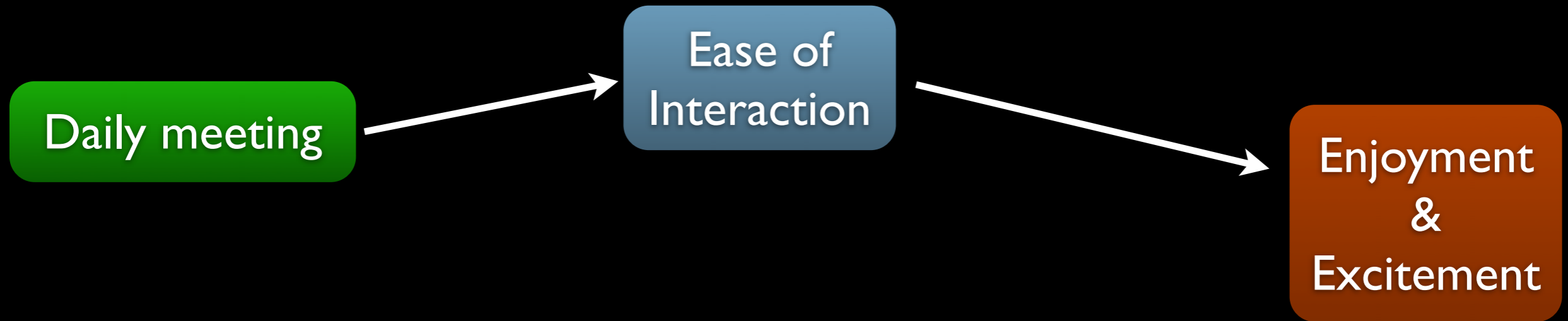
SAST Väst, Lindholmen, 2010-11-23
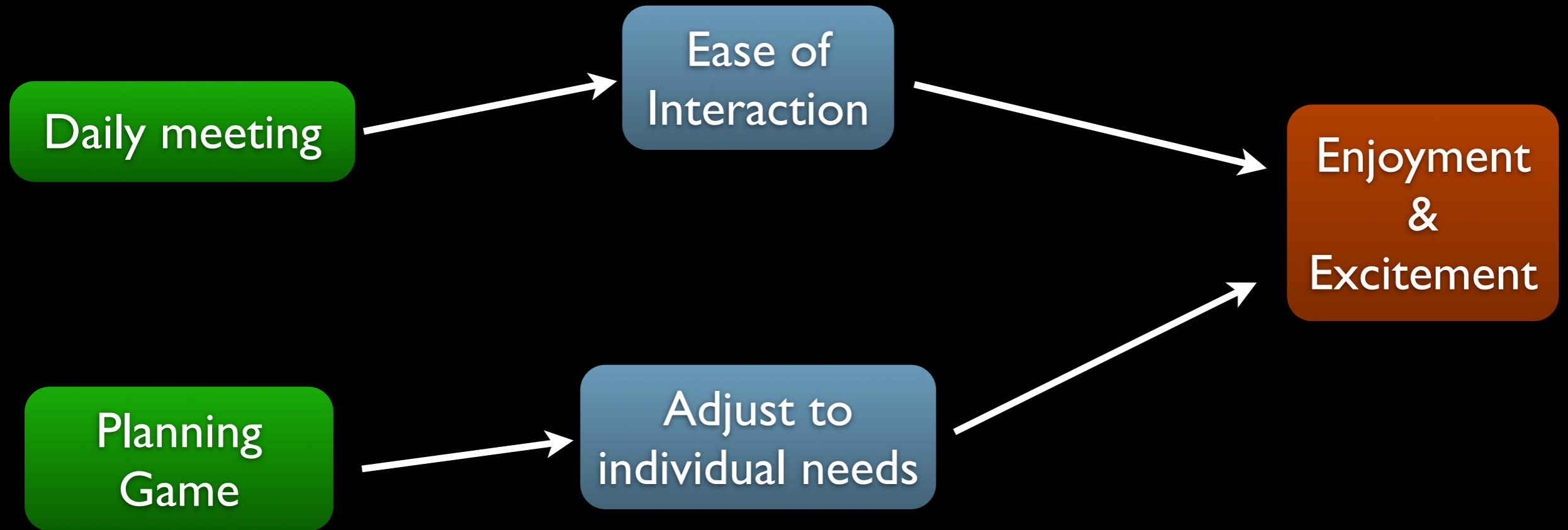
Division of Software Engineering

HOSE Lab (Human-fOcused SE)
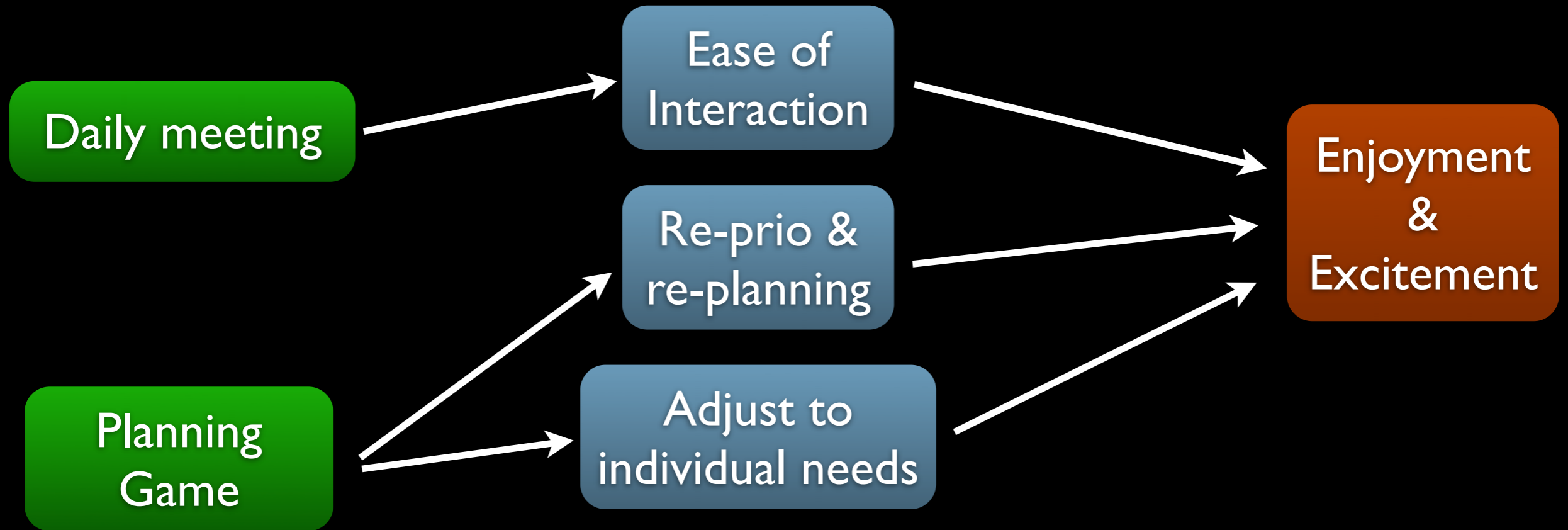
Motivation in 22 agile devs [Whitworth2007]

Motivation in 22 agile devs [Whitworth2007]

```
Daily meeting  →  Ease of Interaction  →  Enjoyment & Excitement
```

Motivation in 22 agile devs [Whitworth2007]

Motivation in 22 agile devs [Whitworth2007]

Daily meeting → Ease of Interaction → Enjoyment & Excitement

Planning Game → Re-prio & re-planning → Enjoyment & Excitement

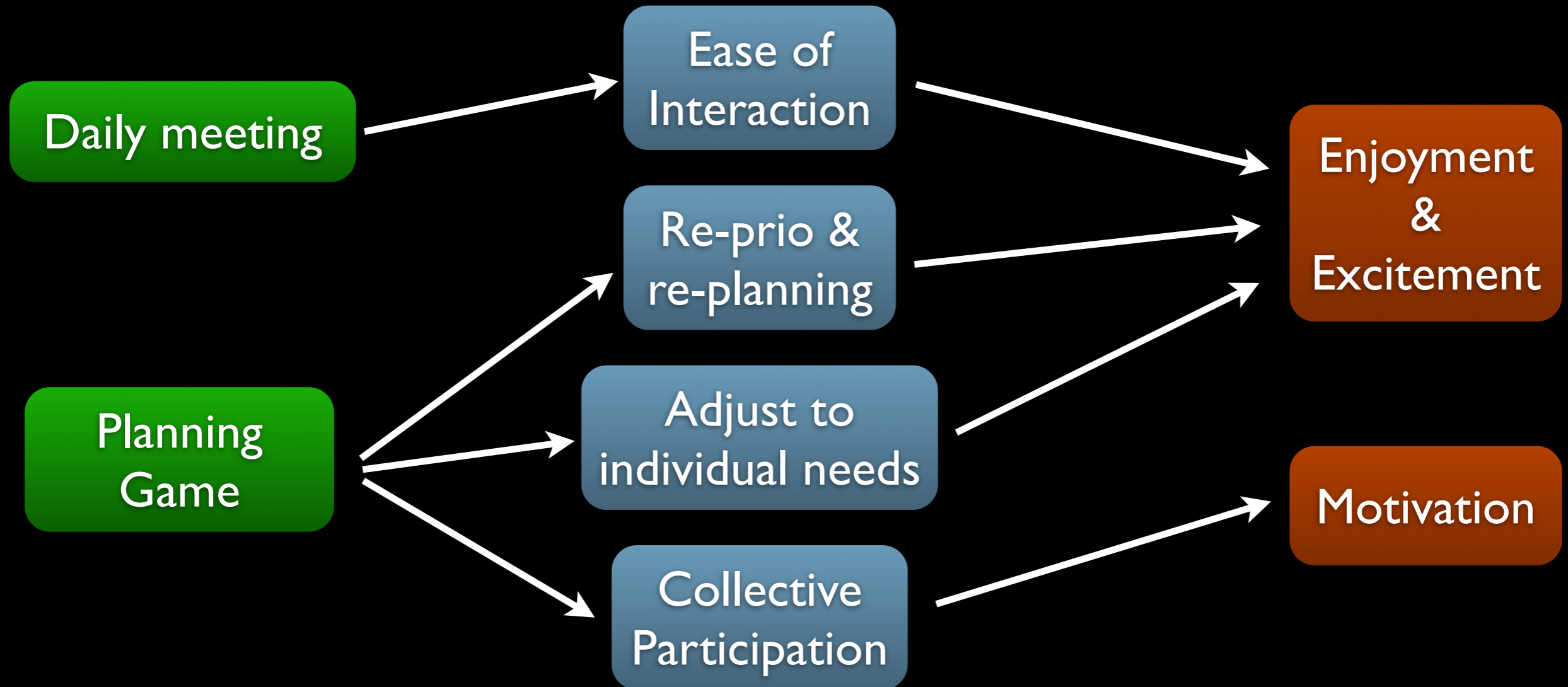Planning Game → Adjust to individual needs → Enjoyment & Excitement

Motivation in 22 agile devs [Whitworth2007]

Motivation in 22 agile devs [Whitworth2007]
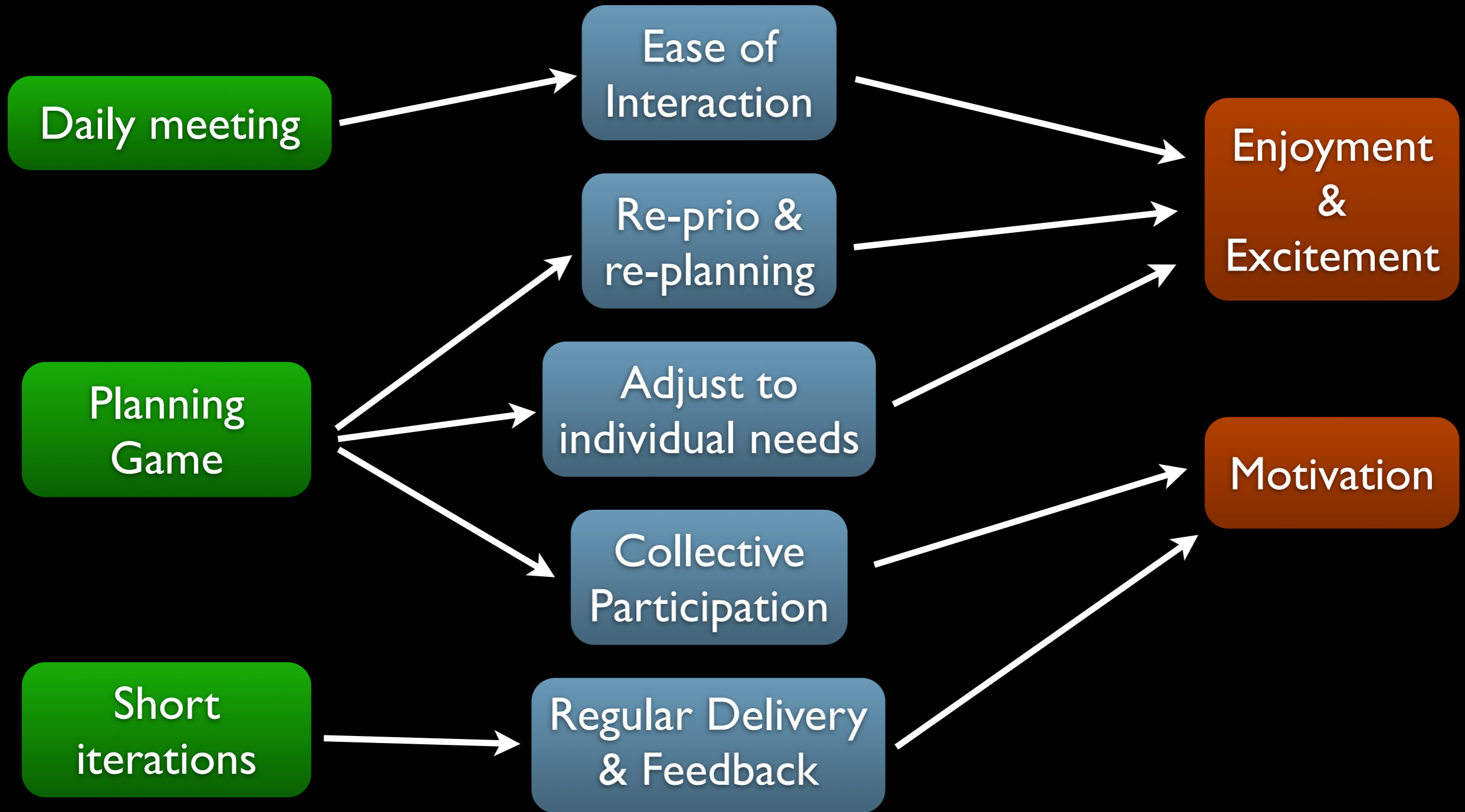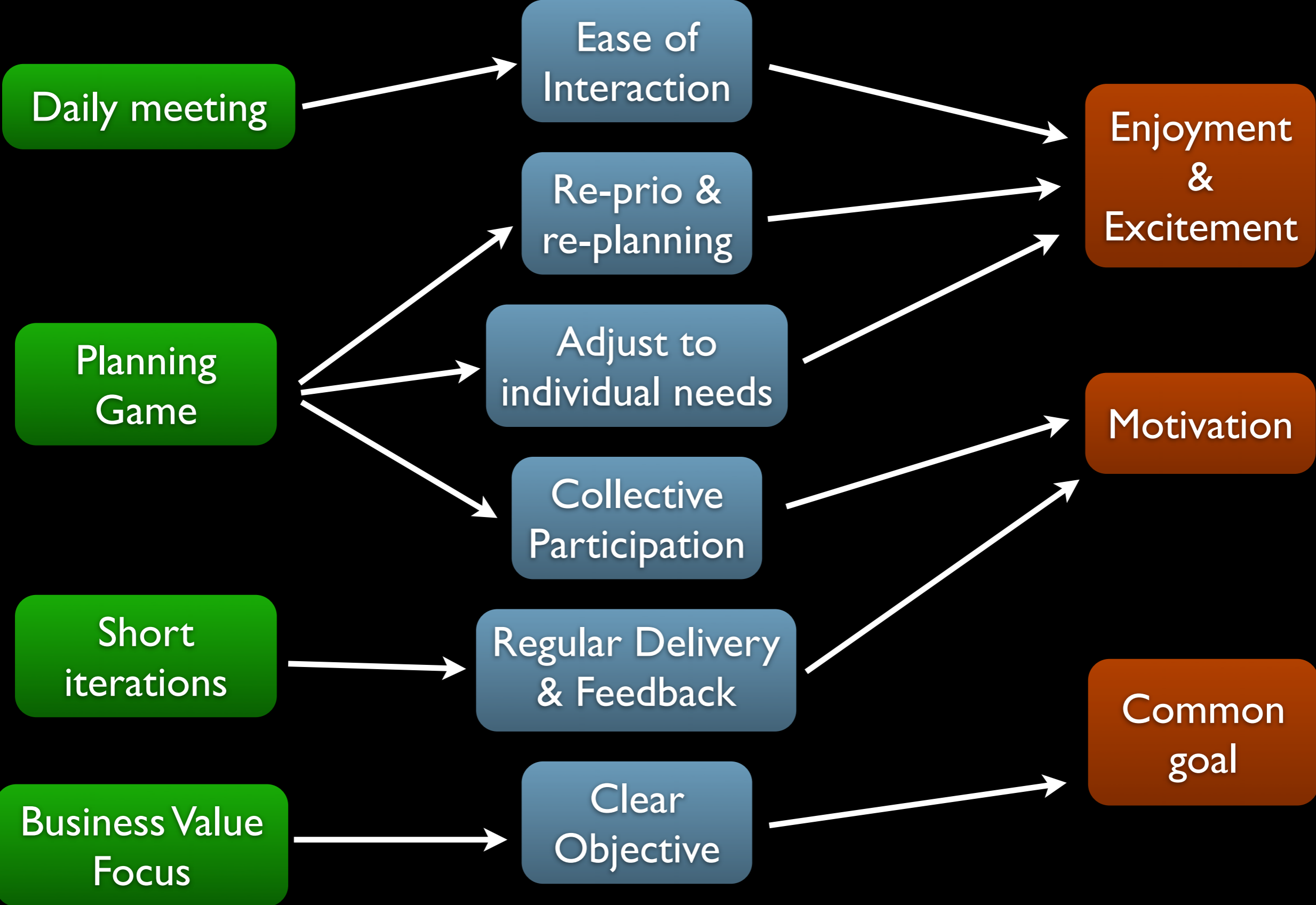
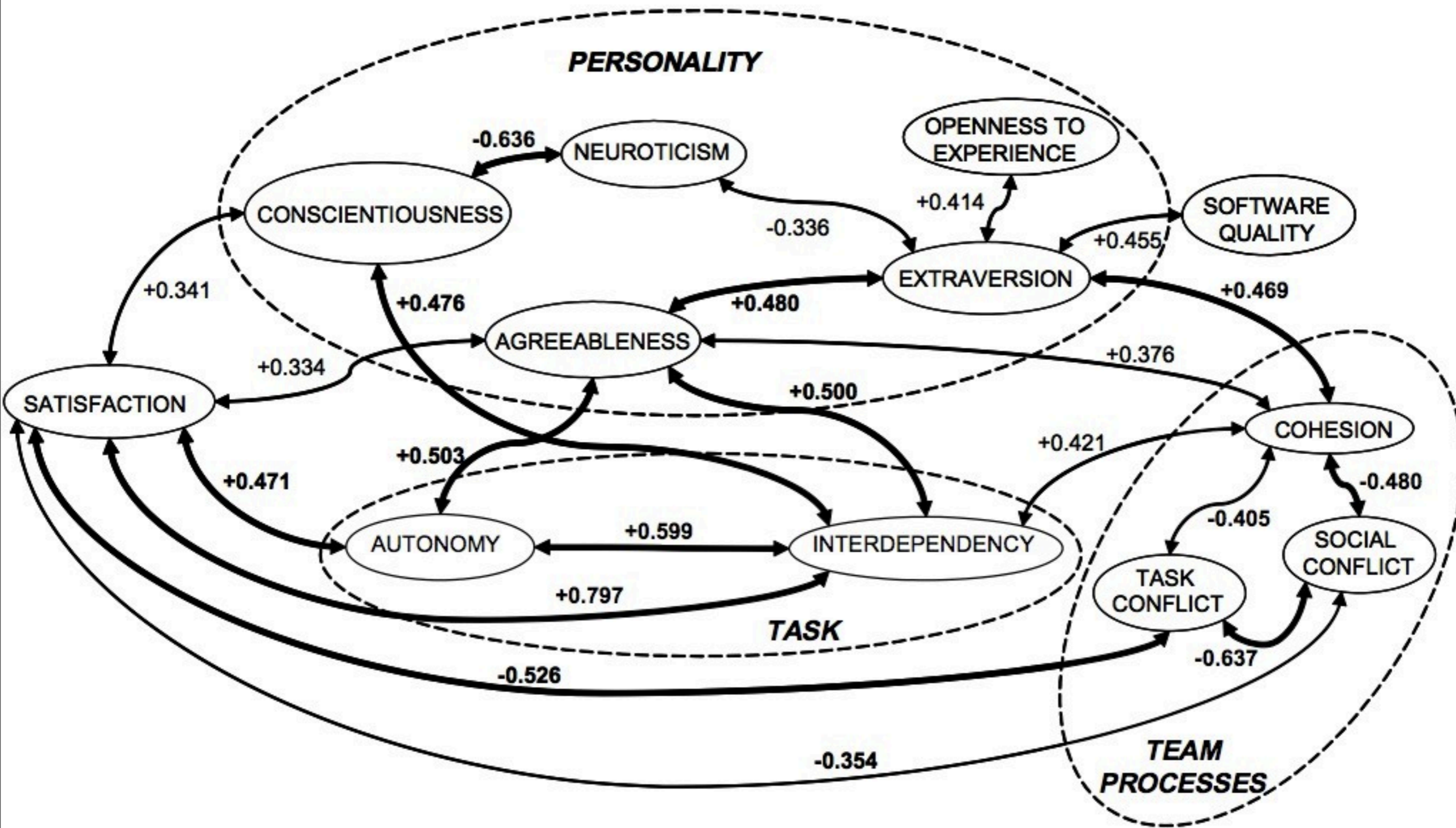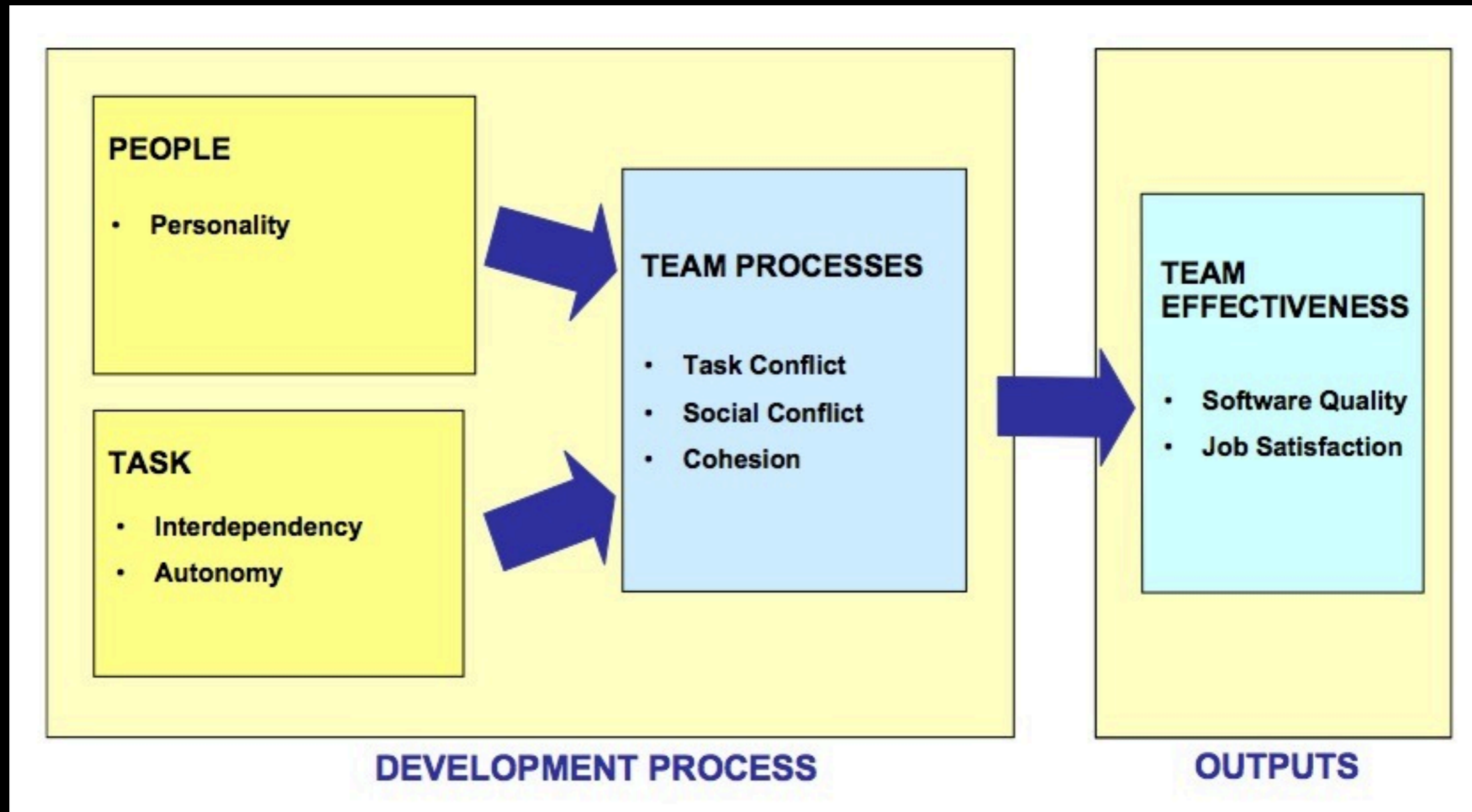# Motivation in 22 agile devs [Whitworth2007]

Fig. 2. Correlations between personality, team processes, task characteristics and quality or satisfaction.

[Acuna2009]

Input - Process - Output Model

[Acuna2009]

Personality and Teams

Table 1
Summary of the findings of social psychology and software engineering research on teams

	Cohesion	Conflict	Performance	Satisfaction
Conscientiousness		−[3]	+[3] +[40] +[50] +[20]	
Extraversion	+[3] +[50]	−[3]	+[4] +[3]	
Agreeableness	+[3] +[40]	−[3] −[40]	+[3] +[40] +[50]	
Neuroticism	−[3] −[50]	+[3]	−[3]	
Openness to experience				+[37] (Task autonomy as moderator)
Cohesion		−[3]	+[54]	

[Acuna2009]

Linking Personality to Views & Attitudes

Linking Personality to Views & Attitudes

47 Industrial SW Engineers

Linking Personality to Views & Attitudes

Personality Test

47 Industrial SW Engineers

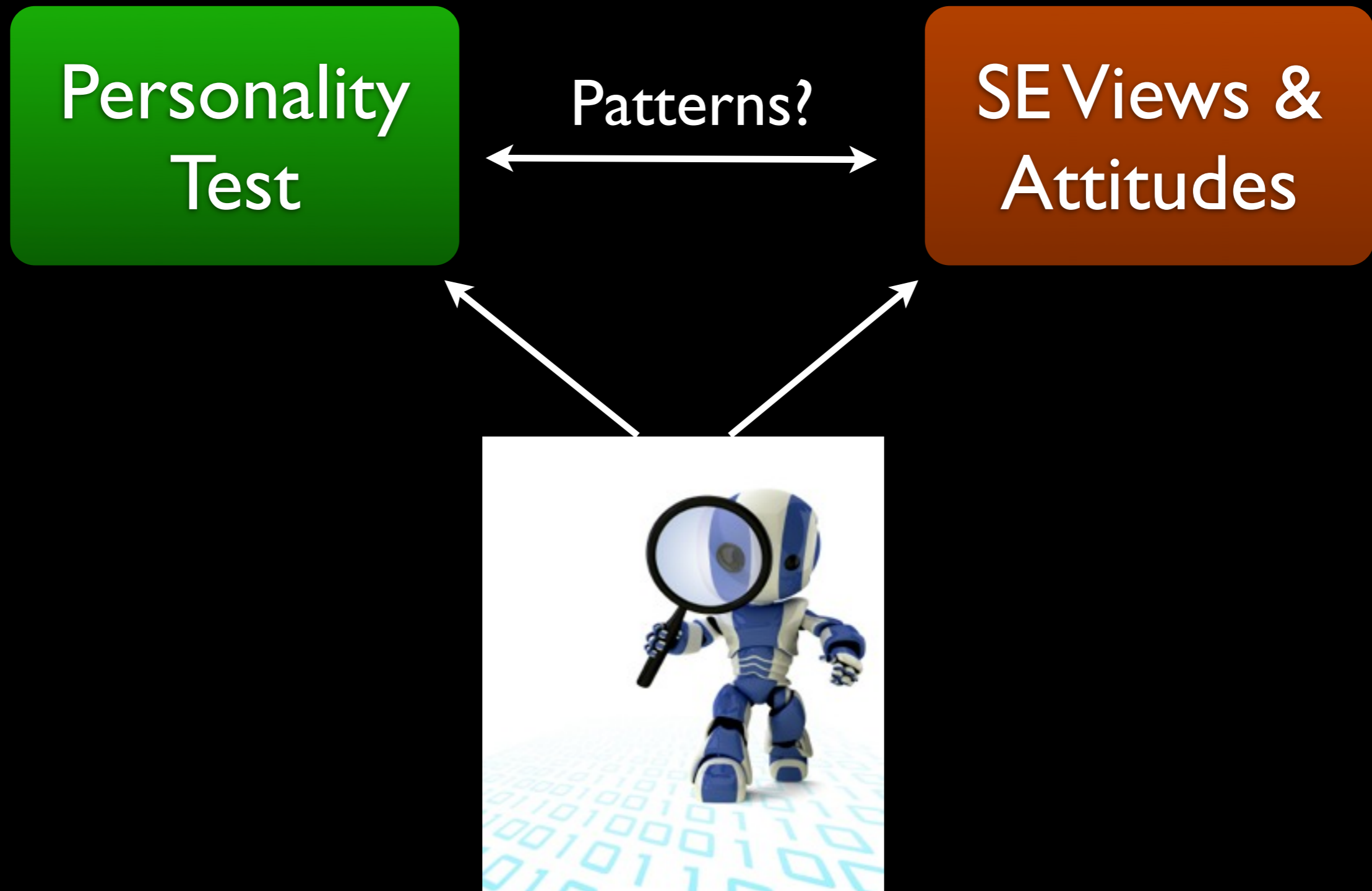# Linking Personality to Views & Attitudes

Personality Test

SE Views & Attitudes

47 Industrial SW Engineers

Linking Personality to Views & Attitudes

Personality Test

Patterns?

SE Views & Attitudes

47 Industrial SW Engineers

Linking Personality to Views & Attitudes

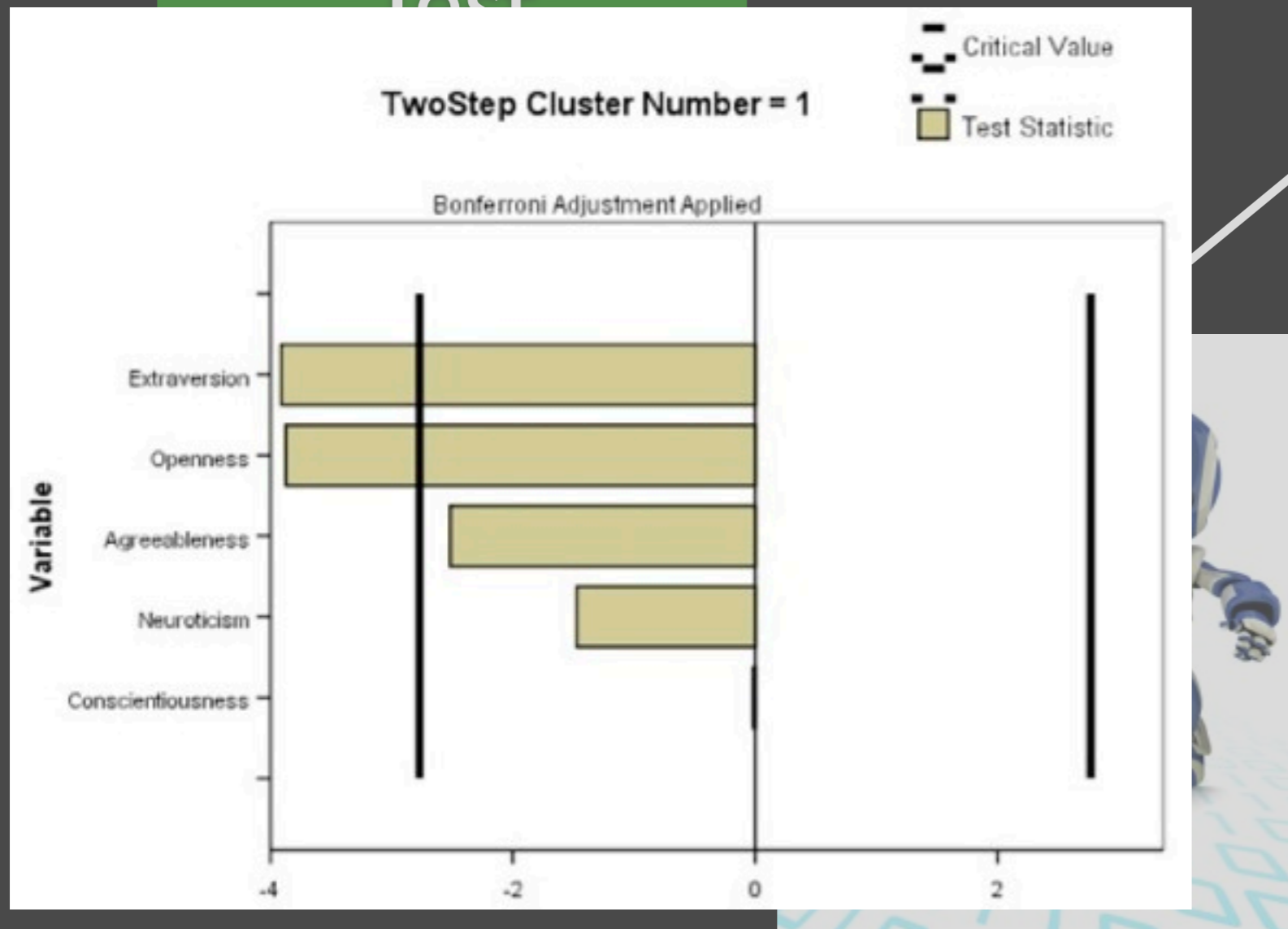Personality Test

Patterns?

SE Views & Attitudes

TwoStep Cluster Number = 1

Bonferroni Adjustment Applied

Critical Value
Test Statistic

Variable: Extraversion, Openness, Agreeableness, Neuroticism, Conscientiousness

47 Industrial SW Engineers

Linking Personality to Views & Attitudes

Personality Test

Patterns?

SE Views & Attitudes

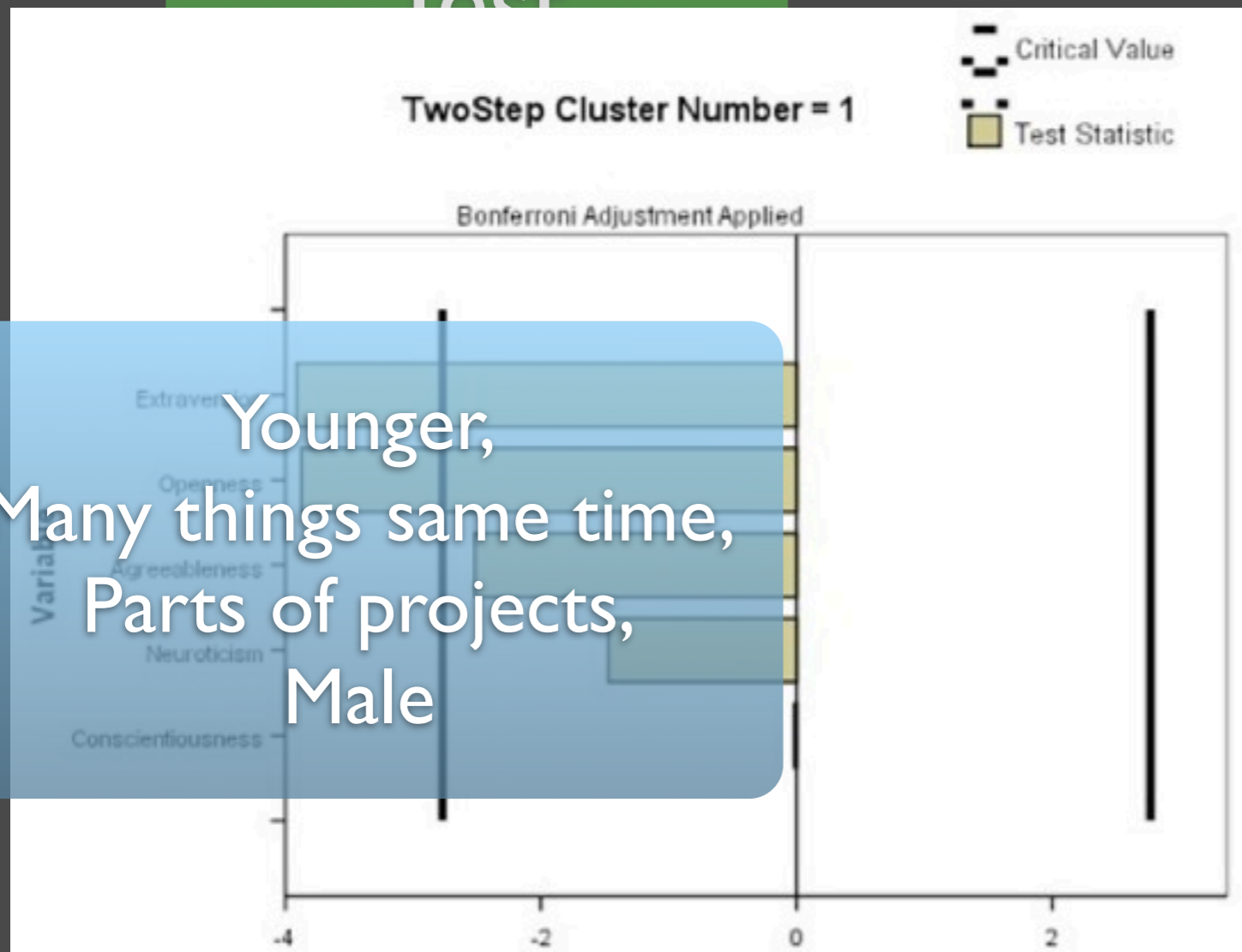TwoStep Cluster Number = 1

Critical Value

Test Statistic

Bonferroni Adjustment Applied

Extraversion
Openness
Agreeableness
Neuroticism
Conscientiousness

Younger,
Many things same time,
Parts of projects,
Male

47 Industrial SW Engineers

Linking Personality to Views & Attitudes

Personality

Patterns?

SE Views & ...udes

The GLM estimated from these variables is:

$$E = c + a_{93} + a_{92} + a_{91} + a_{77}$$

where $c = 33.265$ is the intercept,

$$a_{93} = \begin{cases} -3.640 & \text{for answer 'By yourself'} \\ 0 & \text{for answer 'In a team'} \end{cases},$$

$$a_{92} = \begin{cases} -1.118 & \text{for answer 'One thing at a time'} \\ 0 & \text{for answer 'Several things at once'} \end{cases},$$

$$a_{91} = \begin{cases} 4.672 & \text{for answer 'After a given schedule, project plan'} \\ 0 & \text{for answer 'As the day develops'} \end{cases}, \text{ and}$$

$$a_{77} = \begin{cases} -4.365 & \text{for answer 'Low or Quite low degree'} \\ 0 & \text{for answer 'Quite high or High degree'} \end{cases}.$$

47 Industrial SW Engineers

Linking Personality to Views & Attitudes

Personality

Patterns?

SE Views & ...udes

The GLM estimated from these variables is:

$$E = c + a_{93} + a_{92} + a_{91} + a_{77}$$

where $c = 33.265$ is the intercept,

$$a_{93} = \begin{cases} -3.640 & \text{for answer 'By yourself'} \\ 0 & \text{for answer 'In a team'} \end{cases},$$

$$a_{92} = \begin{cases} -1.118 & \text{for answer 'One thing at a time'} \\ 0 & \text{for answer 'Several things at once'} \end{cases},$$

$$a_{91} = \begin{cases} 4.672 & \text{for answer 'After a given schedule, project plan'} \\ 0 & \text{for answer 'As the day develops'} \end{cases}, \text{ and}$$

$$a_{77} = \begin{cases} -4.365 & \text{for answer 'Low or Quite low degree'} \\ 0 & \text{for answer 'Quite high or High degree'} \end{cases}.$$

Prefer working (with)?

47 Industrial SW Engineers

Linking Personality to Views & Attitudes

Personality

Patterns?

SE Views & ...udes

The GLM estimated from these variables is:

$$E = c + a_{93} + a_{92} + a_{91} + a_{77}$$

where $c = 33.265$ is the intercept,

$$a_{93} = \begin{cases} -3.640 & \text{for answer 'By yourself'} \\ 0 & \text{for answer 'In a team'} \end{cases},$$

$$a_{92} = \begin{cases} -1.118 & \text{for answer 'One thing at a time'} \\ 0 & \text{for answer 'Several things at once'} \end{cases},$$

$$a_{91} = \begin{cases} 4.672 & \text{for answer 'After a given schedule, project plan'} \\ 0 & \text{for answer 'As the day develops'} \end{cases}, \text{ and}$$

$$a_{77} = \begin{cases} -4.365 & \text{for answer 'Low or Quite low degree'} \\ 0 & \text{for answer 'Quite high or High degree'} \end{cases}.$$
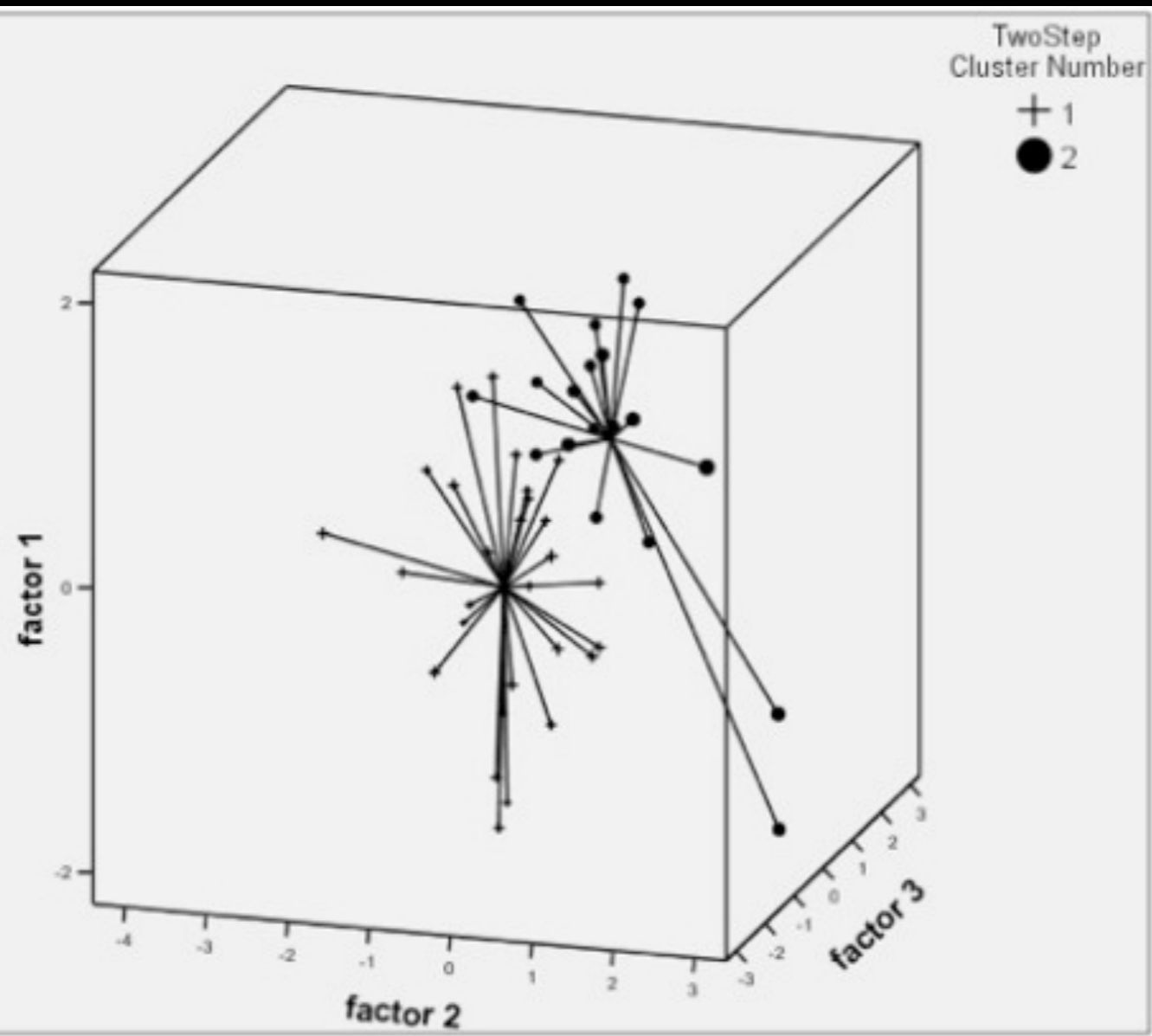
Prefer working (with)?

Take decisions affecting quality?

47 Industrial SW Engineers

Personality and Software Engineering

TwoStep Cluster Number
+ 1
● 2

[Feldt2010]

- Intense personality <->
  - multiple projects
  - parts of projects
- Age & Gender differences
- Higher Extraversion <->
  - prefer team work
  - prefer plan & schedule
- Higher Openness <->
  - whole project responsibility

Agile (RE) Practices - Pro / Con

Face2Face communication & User stories

| Saves time | Requires trust | Customer on site |

| Customer drives | Not all user groups represented |

Iterative req engineering

| Clearer reqs | Minimal docs when problems |

| Customer relation | Cost & schedule estimation |

| | Non-functional requirements |

[Cao2008]

Agile Practices - Pro / Con

"Extreme" Prioritization

Clearer reasons	"Business Value" to narrow
Re-prio is easier	Instable with re-prio

Managing Change through Constant replanning

Fewer changes	Architecture suffers
Smaller changes	"Refactoring" not enough

[Cao2008]

Agile Practices - Pro / Con

Prototypes

Quicker feedback	Unrealistic dev speed expectations

Test-driven Development

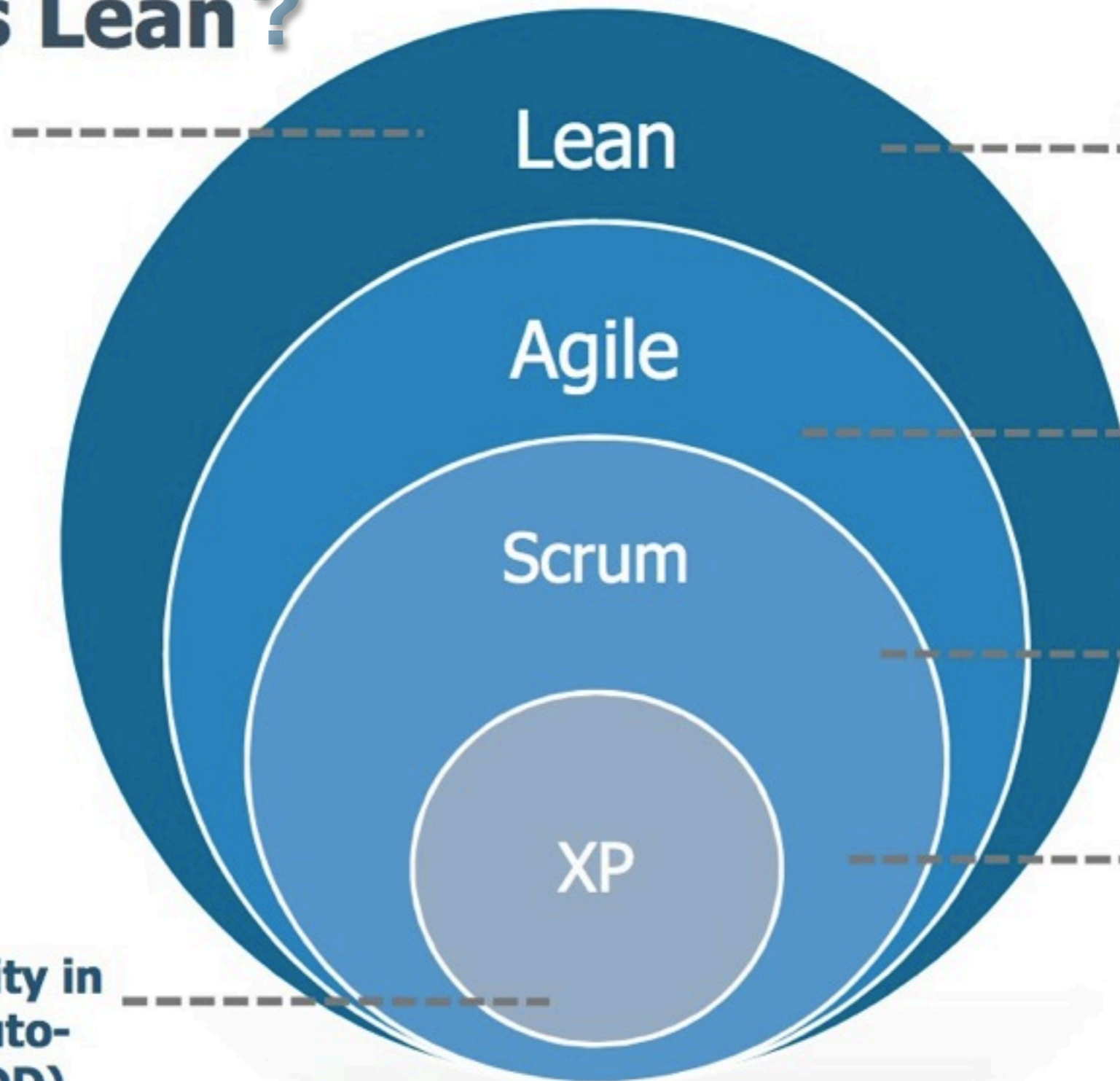|	
Tests capture reqs	Requires close customer collab
Freedom to experiment	Developers resist

[Cao2008]

Reviews & Acceptance tests

Status report to customers	Hard to create acc.tests

Agile is Lean?

Defer commitment
Lean
Optimize the whole
Agile
Eliminate waste
Respect people
Scrum
Focus on learning
XP
Deliver fast / Limit work to capacity / Pull scheduling
Build quality in (jidoka/auto-mation/TDD)

[Kniberg2008]

Up to 2006

Introduction & Adoption | Human & Social Factors | Perceptions | Comparisons

Introduction & Adoption

Human & Social Factors

Perceptions

Comparisons

XP well accepted in **different organizations** (hierarchical structure to little or no control)

Good **interpersonal skills** and **trust** important for successful XP teams

Individual **autonomy must be balanced** with team autonomy

Making progress tracking **visible and audible** important

Important **standardization of collaborative work**

Introduction & Adoption

Human & Social Factors

Perceptions

Comparisons

Customers liked **more (give/get) feedback**

On-site customer stressful/unsustainable

Developers more satisfied with work and product

Pair programming considered tiring since it required focused concentration

Pair programming **hard when skills differ much**

Test-driven development was difficult

XP Buy-in [Gray2006]
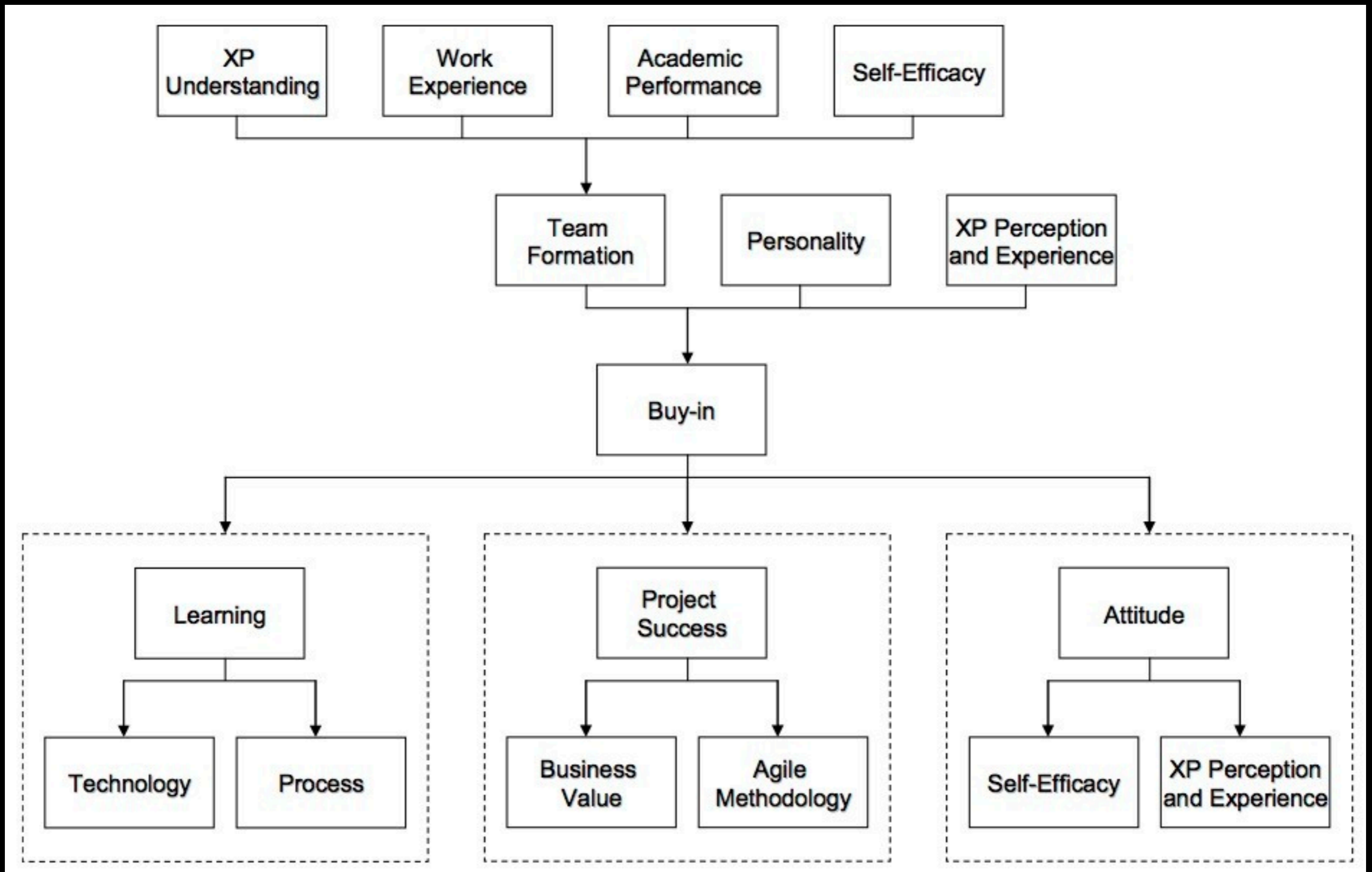
Sources

- Dybå & Dingsöyr, "What do we know about agile sw dev?", IEEE Software, 2009

- Feldt et al, "Links Between the Personalities, Views and Attitudes of Software Engineers", IST, 2010

- Whitworth et al, "Motivation & Cohesion in Agile Teams", XP Conf 2007

- Gray et al, "Forming successful XP teams", AGILE Conf. 2006

- Cao et al, "Agile Requirements Engineering Practices: An Empirical Study," IEEE Software, vol. 25, no. 1, pp. 60-67, Jan./Feb. 2008.

- Kniberg, H., Slides on "Agile and Lean Software Development", Crisp AB, 2008.

- Acuna et al, "How do Personality, Team Processes and Task Characteristics Relate to Job Satisfaction and Software Quality?", IST, 2009.