

# Agile Orientation and Psychological Needs, Self-Efficacy, and Perceived Support: A Two Job-Level Comparison

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## Abstract

*Agile software development introduces a new paradigm into software engineering. The research presented in this paper questioned what individual characteristics, such as psychological needs, self-efficacy and perceived support from peers and managers, can tell us about the agile orientation of software practitioners. Data were gathered using questionnaires completed by 376 software developers employed in two divisions of an international Israeli company. In addition to the research description and findings, we also suggest specific implications derived from the research findings.*

## 1. Introduction

Agile software development methodologies have recently generated great enthusiasm among both practitioners and researchers (Larman, 2004; Turk *et al.*, 2005). The common principle underlying agile methods emphasizes cooperative software development; the focus is more on people and on the dynamics of their interactions, rather than on elaborate requirements planning and rigid software development processes.

The aim of the study presented in this paper is to explore which characteristics of software practitioners and of the workplace environment might lead to the acceptance of the agile approach. For this purpose, we examine relationships between agile orientation and individuals' psychological needs, level of self-efficacy and perceptions of supervisory and co-workers' support.

Our findings indicate that perceived co-worker and supervisory support seem to be a crucial factor that mediates relations between the individual's different psychological needs and his or her agile orientation. Another variable that was found to be important with respect to agile orientation is the level of self-efficacy. In contrast to self-efficacy and psychological needs, which are personal characteristics, the fact that the

perceived co-worker and supervisory support was found to be a significant variable is important since it can be used in the design of work environments. These variables were chosen based on our literature review, as is presented in the continuation of the paper.

The rest of the paper is organized as follows. In Section 2, we present the research model and the relevant theoretical concepts. In Section 3, we present the research method, and in Section 4, the research findings. Finally, in Sections 5 and 6, implications of the research findings are discussed.

## 2. Theoretical background

In this section, we describe the variables of the research model, as presented in Figure 1, and present the research hypothesis.

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Insert Figure 1 about here  
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The research model includes four main variables – Agile Orientation, Psychological Needs, Perceived Supervisory and Co-Workers' Support and Self-Efficacy. This model was examined among juniors' practitioners and among managers.

### Agile orientation

Moving to agile software development requires a change in the software practitioners' mind set, which in turn might lead to stress. Agile orientation is examined in the current study in a way that indicates its meaning in practice.

### Self-efficacy

This variable is defined as an individual characteristic that distinguishes between individuals according to their tendency to perceive difficult events as challenging and to perceive themselves as capable of accomplishing almost any task (Bandura, 1997). The concept of self-efficacy has received increased attention in organizational research over the past two decades (Chen & Bliese, 2002). Bandura (1997)

defined self-efficacy as the “belief in one’s capabilities to organize and execute the courses of action required to produce given attainments” (p. 3). Thus, the higher one’s self-efficacy is, the more likely that he or she engages and persists in task-related behavior. Research has found that self-efficacy positively predicts job attitudes (Saks, 1995), training proficiency (Martocchio & Judge, 1997), and job performance (Stajkovic & Luthans, 1998).

Given the research results related to self-efficacy, we predicted a direct link between self-efficacy and perceived support from supervisors and co-workers as well as a direct link to agile orientation. Since employees' level of self-efficacy is influenced by professional experience, exercise and age (Maly, Costigan & Olney, 2007), we considered the possibility that the influence of self-efficacy might be stronger among managers than among junior employees.

**Hypothesis 1:** *For both job levels – managers and junior employees – high level of self-efficacy will lead directly to a high level of agile orientation and indirectly to positive perceptions of supervisory and co-workers' support.*

### **Psychological needs**

McClelland’s (1961) needs theory attempts to explain and predict attitude and behavior based on an individual’s internal needs.

One of the variables of McClelland’s needs theory is *need for affiliation*. Individuals with a high need for affiliation desire to establish and maintain friendly and close interpersonal relationships with others. These individuals are believed to be people oriented, enjoy social activities, and prefer to join groups and teamwork (Yasin & Stahl, 1990). People with a high need for affiliation are naturally inclined to seek close and intimate relationships with (at least some) other people, and to try to achieve a sense of communion and belongingness with other people in their surroundings (Baumeister & Leary, 1995). In other words, they are attracted towards being involved in supportive, caring relationships in which their feelings, thoughts, and beliefs are respected.

Prior studies have indicated that individuals with a high need for affiliation perform better when they are in a cooperative group or a cohesive team (e.g. Chan, 1981). Given that affiliation focuses on the need for interpersonal harmony or social cohesiveness, we added the need for affiliation to our model which deals with agile orientation.

The second need that we chose to examine is the *need for autonomy*. To further enhance individuals' thriving and optimal functioning, social environments also must nurture individuals' need for autonomy (e.g.

by providing choice). Indeed, Deci and Ryan (2000) argued that the need for autonomy provides many adaptive advantages, including the ability to better regulate one's thoughts, actions, and emotions in concordance with one's own needs and desires, the ability to become more internally coordinated and integrated in terms of functioning, and the ability to disengage from social groups when necessary.

According to Gagné (2003), people are more likely to be intrinsically motivated, that is, to perform an activity simply for the enjoyment they derive from it, when they can freely choose to pursue the activity (autonomy), when they master the activity (competence), and when they feel connected and supported by important people, such as a manager, a parent, a teacher, or team-mates (relatedness). This explains our choice to examine the relation between the need for autonomy and agile orientation.

The third individual need we examined with respect to agile orientation is *the need for dominance*. Individuals with a high need for dominance are believed to seek influence, and to drive themselves to achieve control over others. Studies have found that a high need for dominance is related to managerial effectiveness and motivation (Yasin & Stahl, 1990). Early studies found that individuals with a high need for dominance prefer outcome-oriented cultures, and situations in which they can attain success or power through their own efforts and abilities (Miner, 1980; O’Reilly *et al.*, 1991). Need for dominance has effects on individuals’ attitudes towards goals and goal setting as opposed to accepting goals that are unilaterally assigned by superiors. Individuals with high power (e.g., dominance) prefer to participate in setting of their goals (Locke & Latham, 1990). Since agile software development grants more authorities to individuals in software teams, we associated the need for dominance with agile orientation in our model.

The last individual characteristic we explore regarding agile orientation is the *motivation for change*. According to Miller and Rollnick (2002), people manifest a high intrinsic motivation for change (a) if they perceive the change as important (willingness), (b) if they feel capable of making the change (ability), and (c) if they give a high priority to making the change compared with other priorities (readiness).

The importance of examining connections between the motivation for change and agile orientation stems from the fact that agile software development attempts to cope, in a very systematic and orderly fashion, with the frequent changes that characterize software development environments and processes.

According to the above, we predicted relationships between the level of an individual's self-efficacy and his or her psychological needs.

**Hypothesis 2:** *For both job levels – managers and junior employees – a high level of self-efficacy will lead to a high level of psychological needs.*

### **Perceived supervisory and co-workers' support**

The current study focuses on individuals' perceptions of the support they get from co-workers and managers. According to resource base psychology, support is considered a primary social resource. Specifically, coping resources are factors put in place before stressors occur, factors that can be drawn upon to lessen the costs of dealing with stressors (Wheaton, 1983). Perceived support from co-workers and a supervisor was found to lessen perceived occupational stress (Holder & Vaux, 1998). Therefore, the level of agile orientation is expected to be higher among members of teams in which supervisory support is stronger. Based on these previous research findings, we hypothesized that:

**Hypothesis 3:** *For both job levels – managers and junior employees – software practitioners' perceptions of high supervisory and co-workers' support will directly lead to a high level of agile orientation.*

People and situations are inseparable. It is, therefore, well known that the perceived environment acts as a buffer between the individual's characteristics and his or her performance (Rhoades & Eisenberger, 2002). This led us to our fourth hypothesis:

**Hypothesis 4:** *For both job levels – managers and junior employees – software practitioners' perceptions of supervisory and co-workers support mediate the relations between practitioners' psychological needs and their level of agile orientation.*

This hypothesis is examined separately for each of the four needs (affiliation, dominance, autonomy and motivation for change). For example: a high need for affiliation might lead to positive perceptions of supervisory and co-workers' support, which in turn will lead to a high level of agile orientation; a high need for autonomy might lead to a lower level of perceived supervisory and co-workers' support and therefore to a lower level of agile orientation, and so on.

## **3. Research method**

**Procedure.** The study was based on a questionnaire distributed by hand and by a computer-based system to software practitioners working in two divisions of a

large international communication company located in Israel, which expresses interest in agile development. Advance approval for participation in the study was obtained from each departmental manager. The questionnaire was anonymous.

The response rate (computerized and manual) was 50%, which is considered acceptable in social studies and behavioral studies research (Baruch, 1999).

**Sample.** 376 software developers employed in two divisions of an international Israeli company participated in the study. 105 questionnaires were filled in manually and 271 questionnaires were filled in using the computerized system. Job levels included 228 managerial level practitioners and experts (61%) and 148 junior developer level employees (39%).

Since job level was found to be an explanatory variable of agile orientation, and since we had two job levels, we computed the Structural Equation Modeling (SEM) (Kline, 1998; Mueller, 1996) for each job level. Thus, the SEM model was run twice: first, for the managerial and experts level (N=228), and second, for the junior developers (N=148).

**Measurements.** All research items were measured on a five-point Likert scale (when 1 indicates perceived low level of the measured item and 5 - perceived high level of the measured item).

The four research variables – agile orientation (the dependent variable), psychological needs, perceived supervisory and co-worker' support, and self-efficacy – were measured as is described in what follows.

**Software practitioners' agile orientation** (part 3 of the questionnaire): This part included eight of the 23 items that appeared in the original version of the questionnaire (Hazzan & Dubinsky, 2005). The items address customer expectations, teamwork habits and conceptions. This dependent variable was measured as a continuous variable. Cronbach's alpha internal consistency reliability coefficient of the entire scale was  $\alpha = .62$ . Although this value is relatively low, the inter-correlations among the variables were all positive, moderate and significant, indicating they all measured content belonging to the same content area.

**Software practitioners' level of psychological needs** (part 4 of the questionnaire): This part included 35 items that appeared on the original version of McClelland's (1985) needs survey. This variable was also measured as a continuous variable. The items on the questionnaire address four needs: need for affiliation, need for dominance, need for autonomy, and need for change. Cronbach's alpha internal consistency reliability coefficient of the entire scale was  $\alpha = .72$ .

**Software practitioners' level of self-efficacy** (part 2 of the questionnaire): This variable was measured using the New General Self-Efficacy Scale as adapted from Chen *et al.* (2004). Cronbach's alpha internal consistency reliability coefficient of the entire scale was  $\alpha = .86$ .

**Software practitioners' perceptions of co-workers' and supervisory support** (part 1 of the questionnaire): This variable was measured using 26 of the 44 items that appeared on the original questionnaire developed by Halpin and Croft (1963). This instrument was chosen due to the relevance of its context to our research, as well as its high validity and reliability. This variable was measured as a latent variable, and it includes seven indicators, four of which were adopted due to their correspondence with the topics of this study:

- *Cooperation* indicator, which examines the extent of cooperation among the practitioners and their willingness to work together to achieve goals ( $\alpha = .77$ );
- *Morale* indicator, which examines the extent to which the atmosphere in the team encourages and contributes to the completion of the practitioners' tasks ( $\alpha = .81$ );
- *Intimacy* indicator, which addresses the pleasure practitioners derive from their social relationships ( $\alpha = .80$ );
- *Manager* thoughtfulness indicator, which addresses the extent to which managers treat practitioners' with thoughtfulness, help them in their work, and contribute to improve their work efficiency ( $\alpha = .93$ ).

Cronbach's alpha internal consistency reliability coefficient of the entire scale was  $\alpha = .93$ .

Table 1 presents the means and standard deviations of the study variables and their inter-correlations.

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Insert Table 1 about here  
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## 4. Research findings

SEM (Structural Equation Modeling) with AMOS 4 software was utilized (Byrne, 2006) to test the hypothesized model. Following Anderson and Garbing's (1988) two-step approach, the measurement model and then the structural model were tested, as described in what follows.

### Measurement Model

The measurement model assesses whether all items on a given scale represent the same latent construct. Since most of the constructs were measured with more than five items, a parceling procedure was used (Bagozzi & Heatherton, 1994). The items in perceived

co-workers and supervisory support were parceled randomly.

### Structural model

#### Junior level practitioners

We utilized the SEM model on 148 junior level practitioners in order to examine the research model among those practitioners. According to Table 2 and Table 4, the measurement model fit the data well. While a significant  $\chi^2$  (126.28;  $df = 61$ ;  $p = .00$ ) was expected, given the sample size, other fit statistics were good (see Table 4: CFI = 0.99, NFI = 0.98, NNFI = .98, RMSEA = 0.08). All these measures indicated good model fit, enabling to proceed to the next step.

Table 2 shows regression weights and correlations. Notably, the total explained variance for the agile orientation is 23% (see Figure 2).

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Figure 2 presents the SEM model for juniors practitioners ( $n = 148$ ). As can be seen, all paths are statistically significant.

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Insert Figure 2 about here  
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With respect to Hypothesis 2, the SEM analysis indicates that, unexpectedly, the juniors' level of self-efficacy is not associated directly or indirectly with agile orientation. It was found, however, that junior practitioners' high level of self-efficacy was associated with high motivation for change ( $\beta = .39$ ,  $p < .001$ ), need for dominance ( $\beta = .44$ ,  $p < .001$ ) and need for affiliation ( $\beta = .49$ ,  $p < .001$ ). Therefore, Hypothesis 2 is supported for three out of four needs.

With respect to Hypothesis 3, the SEM analysis indicates that juniors' perceived high level of support significantly leads to a higher level of agile orientation ( $\beta = .27$ ,  $p < .001$ ).

Hypothesis 4 posits that individuals' high perceptions of supervisory and co-workers' support will mediate the relations between practitioners' needs and their level of agile orientation. We found that a high need for affiliation ( $\beta = .42$ ,  $p < .001$ ) and high need for dominance ( $\beta = .22$ ,  $p < .001$ ) are associated with a high perception of supervisory and co-workers' support, which, in turn, leads to agile orientation ( $\beta = .27$ ,  $p < .001$ ). In contrast, a high need for autonomy ( $\beta = -.36$ ,  $p < .001$ ) was found to be associated with perceived low supervisory and co-workers' support, which in turn leads to a low level of agile orientation. We also found that a high level of the need for autonomy among juniors will lead directly to a low level of agile orientation ( $\beta = -.28$ ,  $p < .001$ ). No relations

regarding the motivation for change were found. Therefore, Hypothesis 4 was partially supported for junior practitioners.

To summarize, as can be seen in Figure 2, in which most of the paths are significant, the SEM analysis leads us to conclude that the four hypothesized are supported with respect to junior practitioners.

### **Managerial level practitioners**

We conducted SEM also on the managerial job level (n=228) in order to examine our assumptions regarding that job level as well. According to Tables 3 and 4, different effects were found among the managerial job level.

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Insert Table 3 about here  
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According to Table 4 the measurement model fits the data well. While a significant  $\chi^2$  (137.12;  $df = 61$ ;  $p = .00$ ) was expected, given the sample size, other fit statistics were also good (see Table 4: CFI = 0.99, NFI = 0.98, NNFI = .99, RMSEA = 0.07). All these measures indicated good model fit.

As can be seen in Figure 3, in which most of the paths are significant, the SEM analysis leads us to conclude that the four hypothesized were supported for managerial job level practitioners, although we did not find any significant path from all the psychological needs to perceived support and to agile orientation.

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Insert Figure 3 about here  
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Table 4 presents a comparison between two job levels.

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Table 4 reveals that the SEM was found to be significant for both job levels, except the path 'self-efficacy → need for autonomy' which was found to be not significant for both job levels. In addition, for the junior practitioners, the path 'self efficacy → agile orientation' was found to be not significant, and for the managerial level, the path 'need for dominance → perceived support' was found to be not significant. In the Discussion section these findings are explained.

## **5. Discussion**

The research described in this paper examines the effects on agile orientation of individual characteristics (i.e., psychological needs and self-efficacy), and of the

individual's perceptions of supervisory and co-worker' support.

In general, our research model was found to be a good predictor for juniors as opposed to managers. Specifically, among juniors, psychological needs were found to explain perceived environment support, and therefore agile orientation, to a greater degree. At the same time, however, among managers self-efficacy was found to be a key factor in explaining agile orientation, alongside with some psychological needs. Specifically, self-efficacy behaves differently for the two job levels and is a predictor only with respect to the managerial level.

We now further elaborate on the research findings.

First, the need for autonomy and the need for affiliation were found to be predictors for both job levels; that is, they are beyond the job level variable. Second, the need for autonomy is the only psychological need that is directly and *negatively* associated with agile orientation. Third, the need for autonomy is the only need that is not dependent on the level of self-efficacy.

This singularity of the need for autonomy can be explained as follows. Since agile development is largely dependent on teamwork, the *need for autonomy* might interfere with agile orientation since people with a high need for autonomy will find it difficult to work in agile software teams. This characteristic of agile software development can also explain why the *need for affiliation* is found to influence agile orientation in the opposite way. Therefore, it is not surprising to find, on both job levels, that a high need for affiliation is associated with a positive perception of environment support (i.e., supervisory and co-worker support), which in turn leads to high level of agile orientation.

For both job levels, the *motivation for change* predicts neither perceived environmental support nor agile orientation. The independency between the motivation for change and perceived environmental support can be explained by the fact that, compared with the other three needs, motivation for change does not address people's interpersonal relationships; rather, it addresses individual attitudes toward processes at work. Therefore, it makes sense that motivation for change will not predict perceived environmental support, which is associated with interpersonal relationships. We further explain the finding according to which motivation for change does not relate to agile orientation by the nature of agile development, which introduces an ordered development process that aims at coping with the frequent changes that characterize software development processes. In other words, in agile software development processes, changes are introduced in designated time slots in between which

changes are not introduced. The only finding regarding the motivation for change was that, for both job levels, high self-efficacy is associated with a high motivation for change. This finding receives support from previous studies (Murphy and Roopchand, 2003).

Surprisingly, the *need for dominance* was not associated to agile orientation among managerial level practitioners. On the other hand, among junior level employees, the need for dominance was related to perceived supervisory and co-workers' support, which in turn led to strong agile orientation. It is reasonable to suggest that when one is promoted up the job level ladder, the need for dominance declines (since power is gained through the senior position).

The main difference between the two job levels, however, is manifested in the fact that on the junior level, self-efficacy influences only the employees' level of needs but not their perceptions of support or their agile orientation, while it is found to be a crucial factor among managers.

## 6. Implications for practice

In this section, we suggest operational directions, derived from the research findings, that are relevant to software development environments.

It was expected that a high level need for affiliation will positively influence agile orientation. This was indeed found to be true: individuals with a high need for affiliation perceived their environment as highly supportive, which in turn led to a high agile orientation. In practice, this means that in recruitment and selection processes for agile teams, it is recommended to hire practitioners with a high need for affiliation. In contrast, we found that a high need for autonomy is associated with a weak agile orientation; therefore, we should heighten our awareness of that characteristic when considering candidates for work in agile teams. These implications are applicable for both job levels.

We also highlight perceived supervisory and co-workers' support because it is explained by psychological needs. Accordingly, our implications focus mainly on the work place environment, which was found to have a very meaningful effect on agile orientation. In practice, it is suggested that software development environments, that make the effort to design a supportive environment for their practitioners and encourage supportive behavior by managers and co-workers, can modify and enhance the team members' agile-oriented state of mind.

From an educational perspective, we suggest that issues related to teamwork be emphasized as early as possible in software engineering programs in order to

cultivate the proper supportive environment. In addition, the significance attributed herein to support expressed by management and peers implies the need to re-examine training programs for managers of hi-tech teams, units and organizations, and to enrich their knowledge of managerial skills and employee motivation in order to effectively develop positive and supportive attitudes towards their subordinates. In professional development trainings, the findings suggest that unit and organizations managers should shift from developing technical and professional skills to a focus on developing leadership and interpersonal skills.

There may also be a need to reconsider the staffing of managerial positions. One option is to use screening systems that emphasize personality analysis and assessment of the candidates' abilities to lead and cultivate the climate in their units, rather than basing managerial staffing decisions exclusively on the practitioners' professional (mostly technical) abilities.

The findings concerning junior practitioners indicate a need for individual mentoring by senior managers. Accordingly, we suggest conducting individual mentoring processes on the affective dimension of practice rather than concentrating exclusively on the professional-technical dimension. Such mentoring may assist junior practitioners to better cope with agile environments and demands, enable them to deal with difficulties, and ultimately contribute to an improved atmosphere among teammates.

Finally, we suggest expanding this study to integrate other software development settings, such as small organizations and distributed agile development environments, in order to further understand relationship between agile orientation and individual characteristics (in our case, psychological needs, self efficacy and perceived support from peers and managers).

## 7. Acknowledgement

We would like to thank the Agile Alliance for its generous grant that enabled us to accomplish the research presented in this paper.

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**Table 1. Means, Standard Deviations and Correlation Coefficient among Research Variables (N=376)**

	1	2	3	4	5	6	7	8	9	10	11	12
<b>Mean</b>	<b>3.39</b>	<b>1.98</b>	<b>3.40</b>	<b>4.14</b>	<b>3.16</b>	<b>4.09</b>	<b>4.24</b>	<b>3.56</b>	<b>3.32</b>	<b>3.67</b>	<b>3.50</b>	<b>3.73</b>
<b>SD</b>	<b>.53</b>	<b>.97</b>	<b>.52</b>	<b>.44</b>	<b>.58</b>	<b>.61</b>	<b>.48</b>	<b>.45</b>	<b>.58</b>	<b>.64</b>	<b>.58</b>	<b>.64</b>
1. Agile orientation	---	.26***	.00	.10	-.36***	-.05	.18***	.27***	.38***	.15**	.06	.24***
2. Job level (a)		---	.14*	.06	-.10	-.17***	.12*	.11*	.03	-.02	-.04	.21***
<b><u>Occupational needs</u></b>												
3. Dominance			---	.28***	.22***	.29***	.38***	.13*	-.02	.17***	.10	.12*
4. Affiliation				---	-.04	.38***	.35***	.40***	.20***	.30***	.32***	.29***
5. Autonomy					---	.11*	.01	-.23***	-.30***	-.14**	-.04	-.24***
6. Motivation for change						---	.34***	.10	.01	.16**	.25***	-.06
7. Self-efficacy							---	.28***	.18***	.25***	.21***	.18***
<b><u>Perceived support</u></b>												
8. Mean								---	.54***	.73***	.69***	.86***
9. Cooperation									---	.28***	.03	.41***
10. Morale										---	.55***	.50***
11. Intimacy											---	.34***
12. Manager thoughtfulness												---

\*  $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$

**Table 2. Path coefficients for Structural Equation Model - Junior Developers (N=148)**

		Estimate (B)	S.E.	Standardized Estimate (β)	Critical Ratio
Needs: change	← Self-efficacy	.70	.15	.39	4.73***
Needs: autonomy	← Self-efficacy	.12	.18	.06	.67
Needs: affiliation	← Self-efficacy	1.05	.17	.49	6.11***
Needs: dominance	← Self-efficacy	.88	.16	.44	5.42***
Perceived support	← Needs: Dominance	.06	.03	.22	2.18*
Perceived support	← Needs: affiliation	.10	.03	.42	3.50***
Perceived support	← Needs: autonomy	-.09	.03	-.36	-3.38***
Perceived support	← Needs: change	-.03	.03	-.11	-1.12
Perceived support	← Self-efficacy	.10	.06	.19	1.77
Cooperation	← Perceived support	1.00		.45	
Morale	← Perceived support	1.96	.40	.78	4.97***
Intimacy	← Perceived support	1.37	.29	.65	4.66***
Manager Supportiveness	← Perceived support	1.84	.38	.73	4.87***
Agile Orientation	← Perceived support	.57	.27	.27	2.06*
Agile Orientation	← Self-efficacy	.21	.11	.19	1.88
Agile Orientation	← Needs: change	.02	.05	.04	.42
Agile Orientation	← Needs: autonomy	-.15	.05	-.28	-3.03***
Agile Orientation	← Needs: affiliation	-.10	.05	-.20	-1.90
Agile Orientation	← Needs: Dominance	-.06	.05	-.12	-1.25

\*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

**Table 3. Path Coefficients for Structural Equation Model – Managerial and Experts Job Level (N=228)**

		Estimate (B)	S.E.	Standardized Estimate (β)	Critical Ratio
Needs: change	← Self-efficacy	.88	.15	.40	5.78***
Needs: autonomy	← Self-efficacy	-.01	.15	-.01	-.09
Needs: affiliation	← Self-efficacy	.58	.15	.28	3.99***
Needs: Dominance	← Self-efficacy	.81	.15	.37	5.37***
Perceived support	← Needs: Dominance	.00	.02	.01	.10
Perceived support	← Needs: affiliation	.09	.03	.35	3.61***
Perceived support	← Needs: autonomy	-.05	.02	-.19	-2.46*
Perceived support	← Needs: change	-.02	.02	-.08	-.91
Perceived support	← Self-efficacy	.12	.05	.22	2.34*
Support: Collaboration	← Perceived support	1.00		.43	
Support: Morale	← Perceived support	1.92	.35	.77	5.47***
Support: Intimacy	← Perceived support	1.24	.25	.54	4.90***
Support: Supportiveness	← Perceived support	1.67	.31	.67	5.36***
Agile Orientation	← Perceived support	.34	.18	.18	1.97*
Agile Orientation	← Self-efficacy	.18	.09	.17	2.11*
Agile Orientation	← Needs: Attitude Towards change	-.03	.04	-.06	-.89
Agile Orientation	← Needs: autonomy	-.14	.03	-.28	-4.29***
Agile Orientation	← Needs: affiliation	.02	.04	.04	.48
Agile Orientation	← Needs: Dominance	.00	.04	.00	.02

\*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

**Table 4. Regression Weights and Fit Measures of the Structural Models of the Managerial Level Sample and the Junior Developers Sample**

Standardized regression weights		Managerial level N=228	Junior developers N=148
From	To		
Need for affiliation	Perceived support	.35***	.42***
Need for autonomy	Agile orientation	-.28***	-.28***
Need for autonomy	Perceived support	-.19*	-.36***
Need for dominance	Perceived support	ns	.22*
Self-efficacy	Perceived support	.22*	ns
Perceived support	Agile orientation	*.17	.27*
Self-efficacy	Need for affiliation	.28***	.49***
Self-efficacy	Need for autonomy	ns	ns
Self-efficacy	Need for dominance	.37***	.44***
Self-efficacy	Motivation for change	.40***	.39***
	(df) <sup>2</sup> χ	(61) p=0.00 137.12	(61) 126.28 p=0.00
Fit measures	NFI	.98	.98
	NNFI	.99	.98
	CFI	.99	.99
	RMSEA	.07	.08

\* All fit measures are significant at  $p < .001$

\*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

Figure 1. Research Model

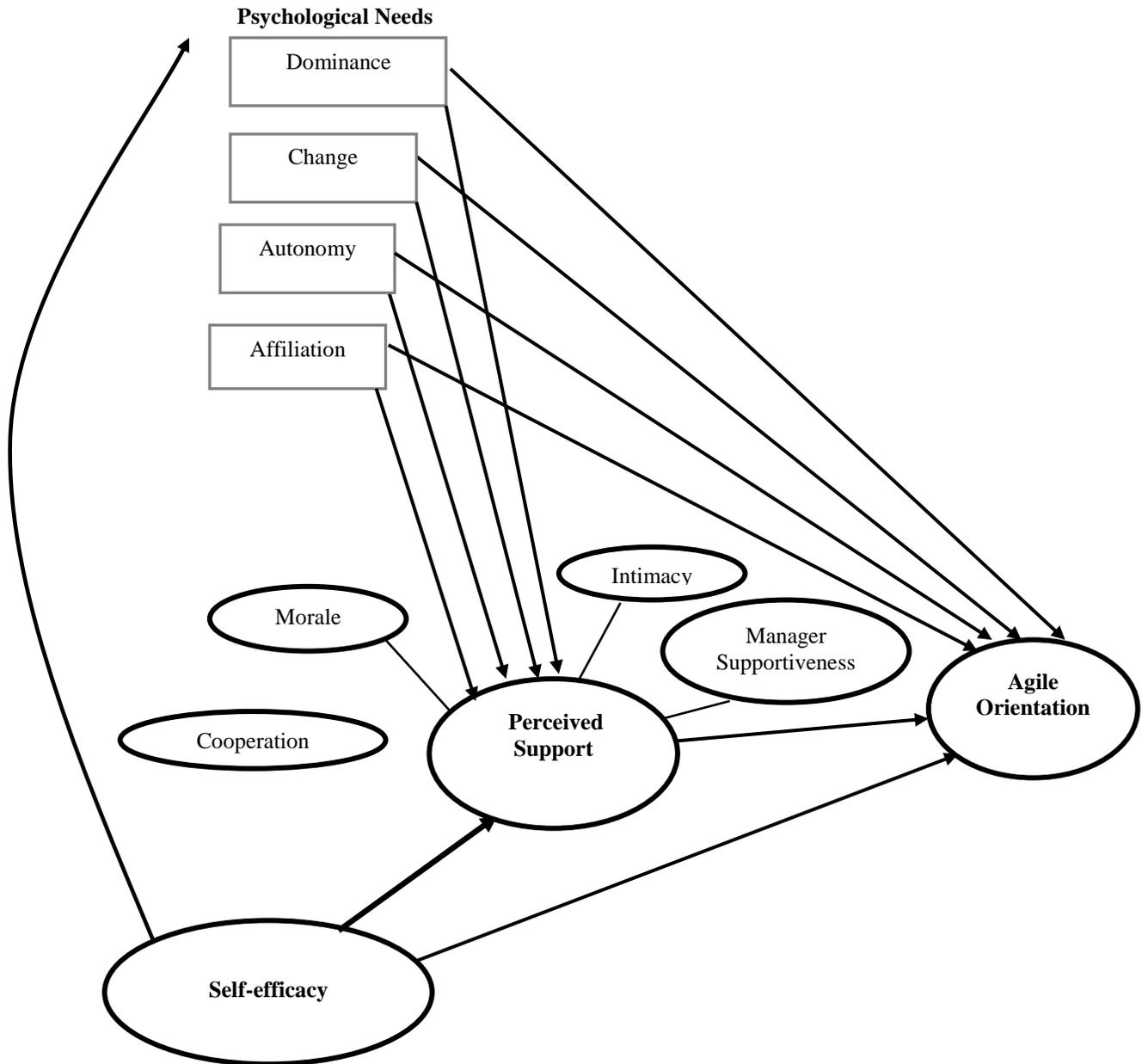


Figure 2. Structural Equation Model - Junior Developers (N=148)

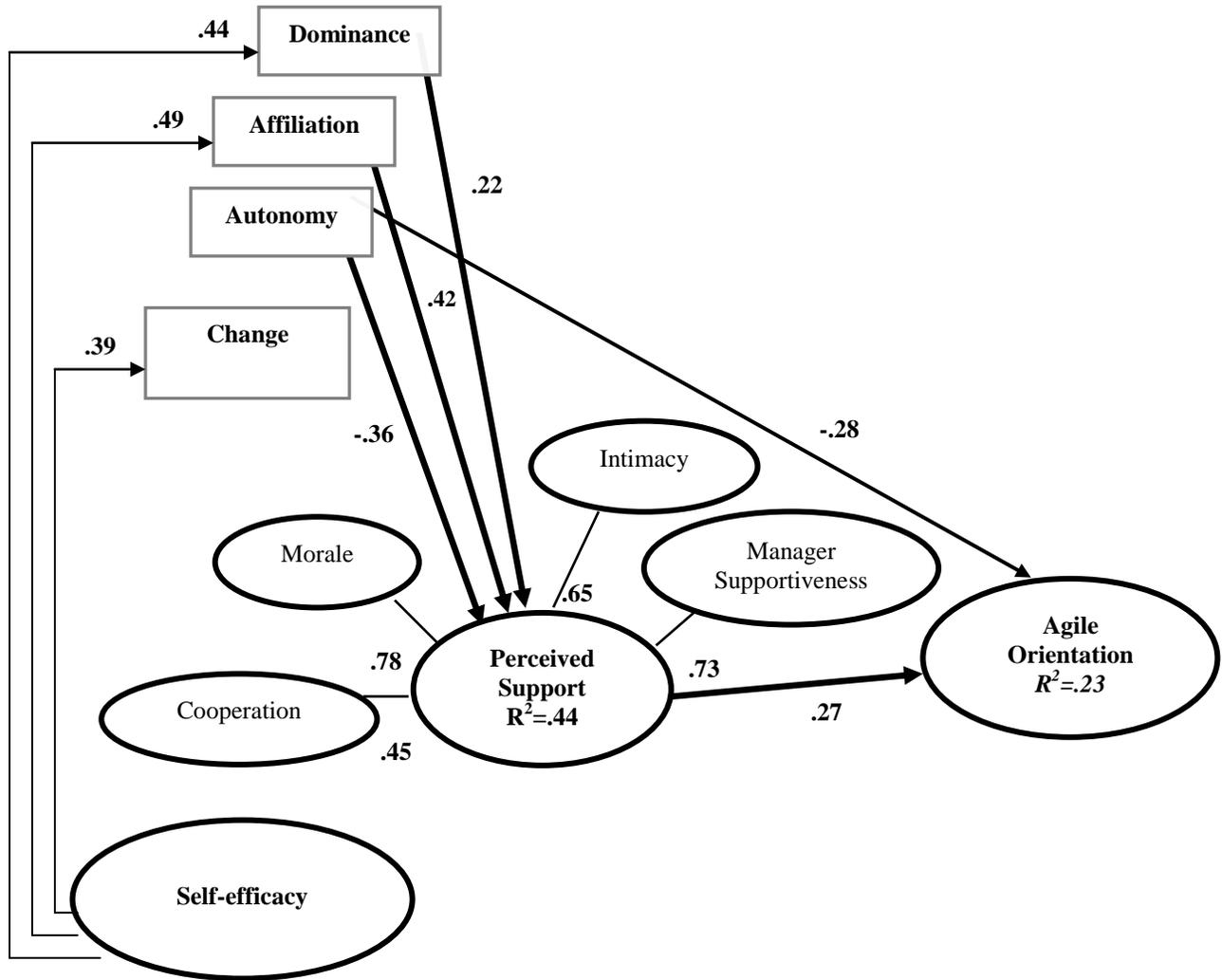


Figure 3. Structural Equation Model - Managerial and Experts Job Level (N=228)

