Competency Profile of Project Team Members – Interplay with Team Dynamics and Project Success

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A B S T R A C T	A R T I C L E I N F O

In contemporary business environment, in which learning and knowledge are considered as the only sustainable competitive advantage of modern organizations, and there is a trend of growing reliance on project type of teams' and organizations' functioning, competencies of project team members are becoming more important than ever. By integrating competencies of fundamental managerial functions and competencies of project management's knowledge areas, this paper investigates the nature of competency profile of project team members, as well as its main effects on project. Established competency profile of project team members is analyzed in relation to project team dynamics and project success. The mediating role of project team dynamics in the effect of competency profile of project team members on project success also investigated in the paper. Cross-sectoral empirical research was conducted during the spring of 2018, through which data from 83 project team members was collected via questionnaire. Collected data was enrolled and processed in SPSS 23.0, with addition of Hayes' (2018) PROCESS Macro for SPSS - v3.2. Results obtained through descriptive, bivariate and multivariate analyses led to very interesting insights and inferences, especially when considering the cluster analysis' and mediation effects' results related to the interplay of project team members' competency profile, project team dynamics and project success.

1. INTRODUCTION

In contemporary business environment there is a trend of growing reliance on project type of teams' and organizations' functioning. According to Lindgren and Packendorff (2006: 842), projects and project-based work are perceived as a way of avoiding inherent problems and pitfalls of bureaucracy and are part of the new wave of new 'post-bureaucratic' organizational forms that has entered most industries during the last decades. In this sense, Pinto, Dawood and Pinto (2014: 578) emphasize that, although project managers and their teams face complex, highly demanding and often-stressful work environments, project-based work grows in popularity, especially in promoting organizational output, initiating critical change and penetrating into industries that were traditionally

bureaucratic in nature. Projects and project-based work offer large opportunity for achieving competitive advantage and/or adding value to the company, as long as they are organized and managed properly on all levels (strategical, tactical and operational) (Poli, Cosić and Lalić, 2010: 29). Consequently, Crawford (2005: 7) emphasizes that there is increasing interest in the competence of project managers and specialized project management staff as more organizations adopt project management approaches and the demand for project managers and project management staff grows.

Turner (1990 in Turner and Müller, 2003: 1) defines project as *'an endeavour in which human, material and financial resources are organized in a novel way, to undertake a unique scope of work, of given specification, within constraints of cost and time, so as to achieve beneficial change defined by quantitative and qualitative objectives'.* From this definition, it is obvious that project-based work represents set of numerous and various challenges, dealing with whom demands from project specialists (project managers, project team members, consultants,…) effective combination of adequate knowledge, methodical expertise, experience and leadership behavior. Synergy of just mentioned elements leads to personal competence of project management staff, which in turn, through its positive effect on project performance, leads to higher organizational performance (Crawford, 2005: 8). In this sense, the key factors for project/project management to be successful are commitment to complete the project, appointment of a skilled project manager, adequate definition of the project, correctly planning the activities in the project, adequate information flow, accommodation of frequent changes, rewarding the employees, being open to innovations and the environment in which the project takes place (Munns and Bjeirmi, 1996 in Isik et al., 2009: 629).

In order for formulated project goals to be achieved, apart from project management staff's competencies, numerous other preconditions and factors need to be aligned and adjusted. As mentioned in previous section, the environment in which project takes place, especially project team dynamics plays key role. Interpersonal dynamics of project teams are often critical factors for a team to function effectively (Buffinton, Jablokow and Martin, 2002: 25). The emergence and constant flow of learning activities, such as intuiting, interpreting, integrating and institutionalizing (Crossan, Lane and White, 1999: 525), as well as usage of knowledge, methods and leadership behavior, heavily depends on team dynamics. If favorable, team dynamics will enable and stimulate project team members to (1) acquire a detailed knowledge of task at hand, (2) communicate effectively at the interpersonal and organizational level, and doing so resolve or mitigate conflict and (3) be able to construct problem solving solutions (Sommerwille and Dalziel, 1998: 169). Consequently, different bundles of characteristics of project team dynamics will be strong predictors or drive project cost, schedule and operability, as emphasized by Scott-Young and Samson, following their comprehensive research on the role of project team factors in project success (2008: 749).

Clearly, competency profile of project team members and project team dynamics play significant or even crucial for project success. Although their effects on project success are discussed in detailed in relevant literature, the interplay between competency profile of project team members and project

team dynamics, especially in the light of project success, is far less investigated. Therefore, Sommerwille and Dalziel (1998: 165) emphasize that opposite to the considerable amount of work in the field of creating project teams, observing how they function and monitoring their performance, little is known of how people behave in project teams, what criteria measures project team success or what actually makes a good project team. Therefore, the goal of this paper is to shed further light on the effects of competency profile of project team members and project team dynamics on project success and especially on the interrelationship between these two constructs and their joint effect on project success. In order to achieve just stated goals, research presented in this paper will try to answer on following, main research questions:

- *What is the nature of effect of competency profile of project team members on project success?*
- *What is the nature of effect of project team dynamics on project success?*
- *Does project team dynamics play mediation role in the effect of competency profile of project team members on project success, and what is the nature of this role?*

2. THEORETICAL FOUNDATIONS

2.1. Project team

Project team is a mixture of roles, authorities and responsibilities, ultimately responsible for successful managing end execution of project. Project team, depending on the size of the project and characteristics of organizational structure of parent organization, will have more or less differentiated roles and number of members and will resemble more or less to functional, matrix or pure project organization form. Namely, project team can take one of the following organizational forms: simple structure (small projects, e.g. organizing events), machine bureaucracy (bureaucratic project, e.g. construction), professional bureaucracy (professional project, e.g. new project development), divisionalized form (multi-project organization/programmes, e.g. management consultants) and adhocracy (adhocracy projects, e.g. large innovative projects) (van Donk and Molloy, 2008: 135). In these organizational forms, apart from project manager, who solely plays all the roles of project team in small projects, project team in large projects can include number of 'assistant managers' and other individuals who can help project manager to effectively manage and execute project (Meredith et al., 2014: 58). In this sense, role and positions on project and in project team such as project board, project sponsor, project owner, project director, project manager, team leader, project consultant, project team member, and project team specialist are among most common ones.

2.2. Competency profile of project team members

Project-based work is a synonym for dynamic and stressful work environment, clear time and budget constraints, multitude of leadership and management challenges and methodological expertise.

No matter how many engineers, administrators, field managers, etc., project team, and every team, according to Belbin (2010), needs to have 9 fundamental role: plant, coordinator, monitor/evaluator, implementer, completer/finisher, resource investigator, shaper, team worker and specialist. In this sense, Buble (2010: 20-22), besides acknowledging the importance of Belbin team roles in effective project team functioning, emphasizes that project team members can play several different roles simultaneously and that all listed roles can be generally divided to team roles and executive/implementing roles. Further, Meredith et al., (2014: 58) state that project team members need to be technically competent, politically sensitive, have strong goal orientation and have high self-esteem. More concretely, A guide to the project management body of knowledge (PMBOK Guide, 2017) lists 10 fundamental project management knowledge areas: project integration management, project scope management, project schedule management, project cost management, project quality management, project resource management, project communications management, project risk management, project procurement management and project stakeholder management. These knowledge areas are supported and even supplemented with other competencies related to fundamental management functions such as planning, organizing, staffing, directing/leading and controlling.

2.3. Project team dynamics

According to the Gelbard and Carmeli (2009: 465), project team dynamics, which refers to the quality and quantity of interactions among project team members, largely determines the success of the project. Team cohesion, efficacy, problem solving, resolving conflicts, communication, mutual support, collaboration, displayed leadership behaviors, etc., are among most important aspects of project team dynamics. Furthermore, project team dynamics and consequential performance is under of heavy influence of organizational context, project team design, leadership and processes (Scott-Young and Samson, 2008: 753) and fluctuates depending on the developmental stage of forming in which specific project team is (Sommerwille and Dalziel, 1998: 165). In this sense, number of researches, such as Allen et al., (1988) have shown that project team' performance and dynamics changes as they age, e.g. project team's performance declines after certain period of steady increase, project teams tend to isolate themselves from technical knowledge and prefer more narrower, specialized work as they age, etc. Difficult to predict, measure, design or manage, project team dynamics remains one of the main project manager's challenges in performing his/hers job.

2.4. Project success

Project success come in various forms (qualitative and quantitative) and time horizons. Nogeste and Walker (2005: 55) suggest that traditional 'iron triangle' of project success or outcomes (time, cost and quality of project outputs) needs to be supplemented with 'value-add' project success or outcomes. Having in mind that ultimate goal of every project to be successful, Shernhar (1996 in Poli

et al., 2010: 33) differentiates 4 broad project success dimensions: 1) efficiency (short-term success dimension), 2) impact on the customers (mid-term success dimension) and 3) impact on the business and 4) building for the future (long-term success dimensions), within which he proposes around 20 concrete success measures. Similarly, Kath et al., after analyzing project success criteria in past 40 years, have developed model which contains 5 project success criteria dimensions: project efficiency (iron triangle), organizational benefits, project impact, stakeholder satisfaction and future potential (Joslin and Müller, 2016: 615). In this sense, but more concretely, Kerzner (2009: 7) proposed 7 main areas of project success: within the allocated time period, within the budgeted cost, at the proper performance or specification level, with acceptance by the customer/user, with minimum or mutually agreed upon scope changes, without disturbing the main work flow of the organization, without changing the corporate culture.

3. RESEARCH MODEL AND METHODOLOGY

To provide answers to previously listed research goals, research model was developed (Figure 1). As shown in the research model, the effects of competency profile of project team members on projects success will be investigated, as well as mediating role, which project team dynamics plays/does not play in mentioned effects.
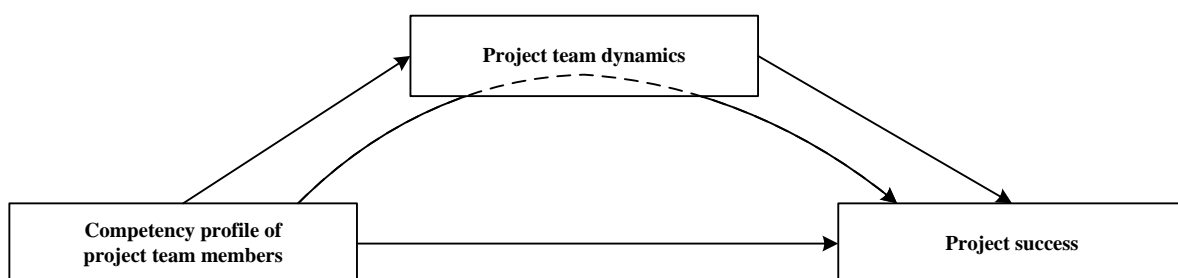
Figure 1. Research model

In order to provide insights and answers to the main research questions posed in the paper, empirical research was conducted during the spring of 2018. As a research instrument, specially developed questionnaire was used. Questionnaire, which contained 42 predominantly 5 point Likert scale questions, was structured in four main areas, namely: (1) general characteristics related to respondent and respondent's company, (2) successfulness of achieving project goals, (3) dynamics of group functioning and (4) competencies related to project-based work. Theoretical foundations, discussed in previous chapter, served as a basis for questionnaire development. Collected data was enrolled and processed in SPSS 23.0. Descriptive (univariate) and inferential (bivariate and multivariate) statistics were conducted in order to provide answers to posted research questions. Concretely, measures of central tendency and dispersion, regression tests and cluster analysis were employed.

Previously identified as project team members, 83 respondents from companies from various industries participated in the empirical research. General characteristics of respondents as well as respondents' companies, i.e. sample characteristics are shown on Figure 2. From Figure 2 it is visible that 9 different industries were represented in the research sample. As expected, largest number of respondents comes from industries of engineering and construction (25.3%) and manufacturing (26.6.%), as these are industries in which project type of work and conducting business activities is present the most. Three quarters of respondents (75.9%) work in privately owned companies. Researched companies conduct projects predominantly on frequent or constant basis (68.7%), while only few companies conduct project very rarely (6.0%).

Almost half of the respondents have project management related graduate study programme diploma (48.2%), followed by respondents with undergraduate study programme diploma (25.3%)

Chart 1 (Industry):
1,2% — 2,4%
9,7%
7,2%
10,8%
9,6%
25,3%
26,6%
7,2%

- Public services
- Engineering and construction
- IT
- Manufacturing
- Commerce
- Consulting
- Tourism/catering
- Pharmaceutics
- Finance

Chart 2 (Ownership):
3,6%
20,5%
75,9%

- Private
- State
- Mixed private & state

Chart 3 (Education):
1,2%
10,8%
14,5%
25,3%
48,2%

- High school
- Undergraduate
- Graduate
- MBA
- PhD

Chart 4 (Position):
4,8%
10,8%
15,7%
20,5%
22,9%
25,3%

- First-line employee
- Office/administration employee
- Engineer/specialist
- Low-level manager
- Middle-level manager
- Top-level manager

Chart 5 (Certification):
18,1%
9,6%
8,4%
63,9%

- No certification, only seminars and courses
- Certification expired
- Possess certification
- Planning to acquire certification

Chart 6 (Project role):
10,8%
10,8%
13,3%
26,5%
38,6%

- Project owner
- Project manager
- Project management team member
- Participant on project
- Consultant on project

Chart 7 (Frequency):
6,0%
12,0%
13,3%
31,4%
37,3%

- Very rarely
- Rarely
- Periodically
- Frequently
- Constantly

Figure 2. Research sample characteristics

and MBA diploma (14.5%). From these respondents, large majority does not possess PMI or IPMA or some other similar certification, but were attending various project management related courses and seminars. Only small portion of respondents do possess mentioned certification (9.6%), while nearly 1/5 of them are planning to acquire such certification in future. Having all this in mind, respondents are distributed, according to their qualification and competencies, on all types of jobs in their companies, from first-line employees to top-level management positions. In this sense, office/administration employees (22.9%), engineers/specialists (25.3%) and low-level managers

(20.5%) are dominant in the research sample, which is expected having in mind just described nature of respondents' qualifications. As for the work on projects, respondents are predominantly participating (26.5%) or are members of project management team (38.6%). Nearly 1/3 of them have perform tasks and duties on projects which demand from them significantly higher level of project management knowledge, competencies and experience, such as project owner, project manager and consultant on project (34.9%).

Just described respondents' and respondents' companies characteristics offer valid basis to conclude that research sample has good representativeness, as far as project-based work is concerned. Therefore, the results and conclusions presented in following text and paper overall have their validness and legitimacy due to the adequate research sample representativeness.

4. FINDINGS

4.1. Descriptive statistics

Results obtained from conducted empirical research through descriptive and inferential statistics offer very interesting insights and inferences. Descriptive statistics for three research constructs, i.e. competency profile of project team members, project team dynamics and project success, are shown in Table 1.

Table 1. Descriptive statistics for competency profile of project team members, project team dynamics and project success

As for the competency profile of project team members, total of 17 competencies, related to project management knowledge areas and fundamental management functions, were investigated. Mean value for competency profile of project team members of 3.71, on the scale from 1 to 5, with standard deviation of 0.89, suggests that project team members possess medium to high level of competencies related to project-based work. In this sense, there are competencies which are on quite high level and stand-out, such as competencies related to project IT (4.00), procurement (4.04), quality (3.99) and system thinking (3.94). On the other hand, seeing thing from other perspective (3.30), handling project cost (3.59) and dealing with project risks (3.53) are the areas in which project team members do not feel that much comfortable. Improving just emphasized questionable competencies' areas would lead to more favorable competency profile of project team members and project team members' preparedness for project-based work's challenges.

Project team dynamics, compared with discussed competency profile of project team members, is much better and is on high level (*mean*=3.89; *SD*=0.80). Results suggest that project team dynamics is characterized with very strong goal orientation of project team members (4.40) and highly efficient decision-making (3.99). Ways in which conflict is resolved in project team (3.61) and closely related project team members' perception of own actions and effects of these actions (3.71) are on the lowest level of all investigated aspects of project team dynamics.

Successfulness of the projects on which respondents where engaged, with their competencies and present project team dynamics, was on high level (*mean*=4.01; *SD*=0.70). Differences in the project successfulness from one criterion to another are pretty small. The most successful aspect of the projects is their impact on customers (4.25), followed by closely related criteria of projects' output quality (4.19). The aspects in which projects were the least successful, but still on high level, are those oriented on future, i.e. project team learning/development and organizational benefits related to knowledge and experience gained which can be useful for future projects. The aspect of project costs is also something that demands additional attention by project team members.

4.2. Model testing

In order to provide answers to research question, research model was tested by means of inferential statistics. In this sense, the results of linear regression analyses, testing direct and indirect/mediation effect of one research construct onto another, conducted via *PROCESS macro* (Hayes, 2018), are presented Figure 3 and Appendix A. Presented results clearly indicate that competency profile of project team members has statistically significant effect ($p < .01$) on project team dynamics and project success. From the two, the effects on project team dynamics is stronger ($b = .57$, $R^2 = .40$ vs. $b = .39$, $R^2 = .58$). Project team dynamics also has statistically significant effect on project success and this effect is not as strong ($b = .30$, $R^2 = .58$, $p = < .01$) as the effect of competency profile of project team members on projects success. Considering the mediating role of project team dynamics in the effect of competency profile of project team members on project success, results of direct effect and indirect effects show that there is a statistically significant, positive mediation effect of project
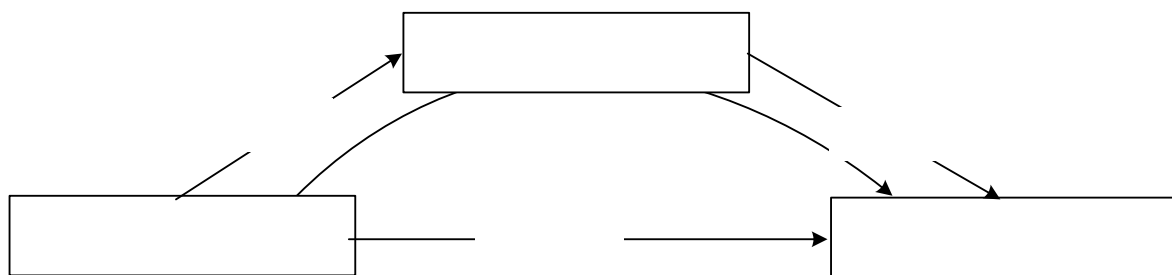
Figure 3. The interplay between competency profile of project team members and project team dynamics and their effects on project success

team dynamics. Namely, when comparing total and direct effects of competency profile of project team members on project success, there is a difference in contribution (b) and this difference or indirect effect of competency profile of project team members on project success, through project team dynamic, is statistically significant ($b = .56$ vs. $b = .39 => b = .17$, *BootLLCI* = .0579, *BootULCI* = .2623). These results indicate that project team dynamics additionally boosts the positive effect of competency profile of project team members on project success.

With the aim of shedding further light into the interplay between competency profile of project team members and project team dynamics and their effects on project success, tested with research model, a K-means cluster analysis was conducted. Classifying the research sample into 2 clusters on the basis of project-based work' competencies of project team members and testing the research model separately for every cluster will provide additional insight into mentioned interplay between research constructs. In this sense, Table 2 shown the results of cluster analysis. Cluster 1 contains 30 project team members with significantly lower competency profile, compared with cluster 2, which contains 53 project team members with higher competency profile.

Table 2. K-means cluster analysis of the research sample based on project-based work' competencies of project team members

The results of testing the research model, driven by conducted cluster analysis results, are shown on Figure 4 and Appendixes B and C. Interestingly, when project team members have lower competency profile, that profile does not effect project team dynamics ($p = .49$), while the effect of project team dynamics on project success in somewhat questionable ($b = .27$, $p = .06$) in these circumstances. Even if it is on lower levels, competency profile of project team members effects project success, but only directly ($b = .37$, $p = .03$), while total effect is slightly lower and questionable due to the non-existence of indirect effect of project team dynamics ($b = -.04$, $BootLLCI = -.1859$, $BootULCI = .0709$). In other words, in the situation when project team members poses lower competency profile, project team dynamics if not influenced by that competency profile and does not play significant, i.e. mediating role in the effect of competency profile of project team members on project success. As for the situation in which project team members possess high level of project-based work's competencies, here the results are similar to initial model testing, but effects are magnified. All effects are much stronger compared to initial model testing and especially compared to the situation in there is a lower level of competency profile of project team members. This leads to conclusion that project team dynamics plays significant or boosting role in the positive effect of competency profile of project team members on project success only when mentioned competency profile is on higher levels.

Figure 4. The interplay between competency profile of project team members and project team dynamics and their effects on project success (clusters 1 and 2)
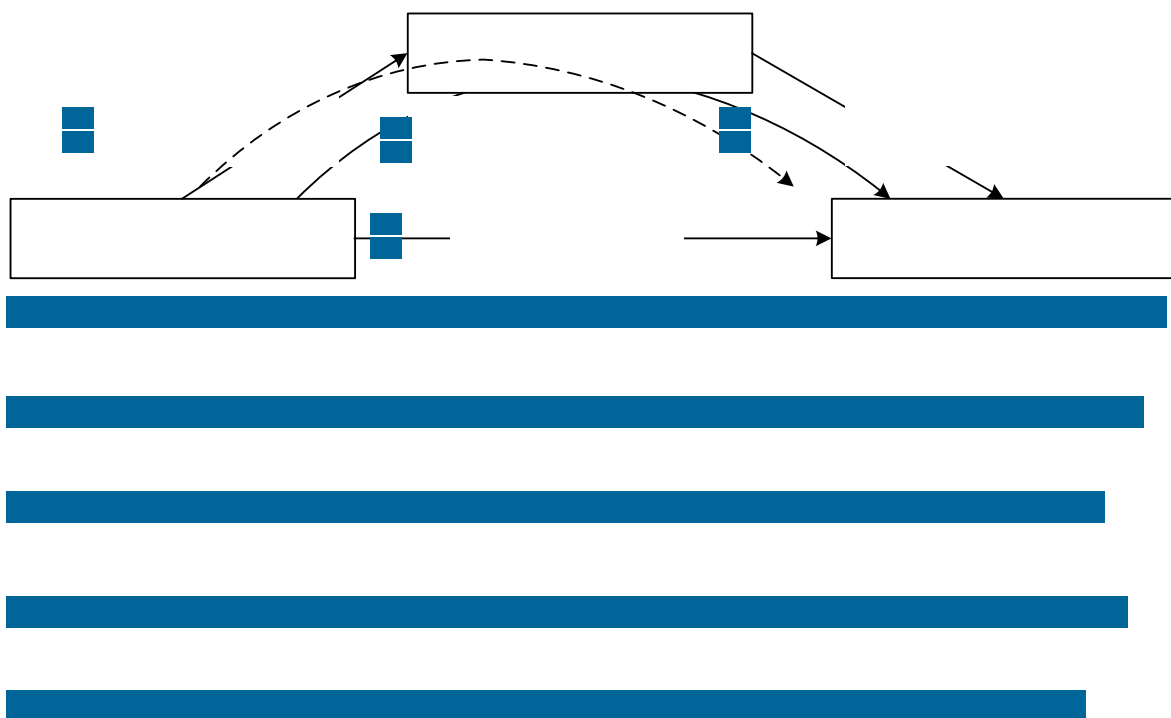
5. CONCLUSIONS

Today, project-based work is increasingly being implemented in order to conduct business activities in more responsible, goal oriented, time and cost limited, quality driven and expectations of customers' and stakeholders' led manner. Competencies of project-based work are becoming even more important in contemporary business environment, having in mind the crucial role and major impact which competencies of project management personnel have on project performance/success and therefore business performance (Crawford, 2005: 7). Adding to that the widely adopted stand that learning and knowledge can be the only sustainable competitive advantage in 21st century, the nature and the level of competencies of project team members is direction within project management field, which demands further and stronger research emphasis.

Empirical research in this paper has answered three main research question posted in the paper. Competency profile of project team members plays significant role in achieving desired project performance and outcome levels and ultimately ensuring project success. While positively effecting the project success, competency profile of project team members also positively effects project team dynamics and through project team dynamics also additionally, indirectly positively effects project success. Although indirect positive effect of competency profile of project team members, through project team dynamics, on project success is significantly lower compared to the size of its direct effect, the great potential and role of mentioned indirect effect, i.e. interplay between competency profile of project team members and project team dynamics in achieving project success, must not be neglected in any way. In this sense, cluster analysis driven additional testing of paper's research model showed that the role of project team dynamics in the relationship between competency profile of project team members and project success is heavily magnified when the levels of competencies of project team members are on higher or high level. To exploit the mediating positive or boosting role of project team dynamics in achieving project success, low and modest levels of project-based work' competencies of project team members are something that needs to be avoided by all means by person(s) responsible for structuring and forming project team.

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Appendix A - Results of model testing - PROCESS procedure for SPSS (Hayes, 2018) (N=83)

```
**************** PROCESS Procedure for SPSS Version 3.00 *****************
```

```
        Written by Andrew F. Hayes, Ph.D.        www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

****************************************************************************
Model  : 4
    Y  : GOALS
    X  : COMP
    M  : DYNAMIC

Sample
Size:  83

****************************************************************************
OUTCOME VARIABLE:
 DYNAMIC

Model Summary
         R       R-sq        MSE          F        df1        df2          p
     ,6305      ,3975      ,3963    53,4326     1,0000    81,0000      ,0000

Model
             coeff         se          t          p       LLCI       ULCI
constant    1,7700      ,2977     5,9449      ,0000     1,1776     2,3625
COMP         ,5706      ,0781     7,3098      ,0000      ,4153      ,7259

****************************************************************************
OUTCOME VARIABLE:
 GOALS

Model Summary
         R       R-sq        MSE          F        df1        df2          p
     ,7616      ,5800      ,2095    55,2327     2,0000    80,0000      ,0000

Model
             coeff         se          t          p       LLCI       ULCI
constant    1,4101      ,2595     5,4350      ,0000      ,8938     1,9265
COMP         ,3877      ,0731     5,3025      ,0000      ,2422      ,5332
DYNAMIC      ,2990      ,0808     3,7010      ,0004      ,1382      ,4598

************************* TOTAL EFFECT MODEL ***************************
OUTCOME VARIABLE:
 GOALS

Model Summary
         R       R-sq        MSE          F        df1        df2          p
     ,7128      ,5081      ,2423    83,6547     1,0000    81,0000      ,0000

Model
             coeff         se          t          p       LLCI       ULCI
constant    1,9394      ,2328     8,3292      ,0000     1,4761     2,4026
COMP         ,5583      ,0610     9,1463      ,0000      ,4369      ,6798

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
    Effect         se          t          p       LLCI       ULCI       c_ps       c_cs
     ,5583      ,0610     9,1463      ,0000      ,4369      ,6798      ,8004      ,7128

Direct effect of X on Y
    Effect         se          t          p       LLCI       ULCI      c'_ps      c'_cs
     ,3877      ,0731     5,3025      ,0000      ,2422      ,5332      ,5558      ,4950

Indirect effect(s) of X on Y:
          Effect    BootSE  BootLLCI  BootULCI
DYNAMIC    ,1706     ,0516     ,0549     ,2656

Partially standardized indirect effect(s) of X on Y:
          Effect    BootSE  BootLLCI  BootULCI
DYNAMIC    ,2446     ,0783     ,0790     ,3965

Completely standardized indirect effect(s) of X on Y:
          Effect    BootSE  BootLLCI  BootULCI
DYNAMIC    ,2178     ,0673     ,0663     ,3399

********************** ANALYSIS NOTES AND ERRORS **********************

Level of confidence for all confidence intervals in output:
  95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

------ END MATRIX -----
```

Appendix B - Results of model testing - PROCESS procedure for SPSS (C1; N=30)

```
**************** PROCESS Procedure for SPSS Version 3.00 ****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
      Documentation available in Hayes (2018). www.guilford.com/p/hayes3

*************************************************************************
Model  : 4
    Y  : GOALS
    X  : COMP
    M  : DYNAMIC

Sample
Size:  30

*************************************************************************
OUTCOME VARIABLE:
 DYNAMIC

Model Summary
          R        R-sq        MSE          F        df1        df2          p
      ,1298       ,0169      ,5266      ,4801     1,0000    28,0000      ,4941

Model
               coeff         se          t          p       LLCI       ULCI
constant      3,6282      ,6085     5,9624      ,0000     2,3817     4,8747
COMP          -,1488      ,2148     -,6929      ,4941     -,5889      ,2912

*************************************************************************
OUTCOME VARIABLE:
 GOALS

Model Summary
          R        R-sq        MSE          F        df1        df2          p
      ,4890       ,2391      ,2728     4,2423     2,0000    27,0000      ,0250

Model
               coeff         se          t          p       LLCI       ULCI
constant      1,5919      ,6599     2,4124      ,0229      ,2379     2,9458
COMP           ,3692      ,1559     2,3673      ,0253      ,0492      ,6891
DYNAMIC        ,2707      ,1360     1,9902      ,0568     -,0084      ,5498

************************** TOTAL EFFECT MODEL ***************************
OUTCOME VARIABLE:
 GOALS

Model Summary
          R        R-sq        MSE          F        df1        df2          p
      ,3570       ,1275      ,3017     4,0909     1,0000    28,0000      ,0528

Model
               coeff         se          t          p       LLCI       ULCI
constant      2,5741      ,4606     5,5889      ,0000     1,6306     3,5176
COMP           ,3289      ,1626     2,0226      ,0528     -,0042      ,6619

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
     Effect         se          t          p       LLCI       ULCI       c_ps       c_cs
      ,3289      ,1626     2,0226      ,0528     -,0042      ,6619      ,5692      ,3570

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI      c'_ps      c'_cs
      ,3692      ,1559     2,3673      ,0253      ,0492      ,6891      ,6389      ,4008

Indirect effect(s) of X on Y:
             Effect     BootSE   BootLLCI   BootULCI
DYNAMIC      -,0403      ,0650     -,1859      ,0709

Partially standardized indirect effect(s) of X on Y:
             Effect     BootSE   BootLLCI   BootULCI
DYNAMIC      -,0697      ,1182     -,3359      ,1311

Completely standardized indirect effect(s) of X on Y:
             Effect     BootSE   BootLLCI   BootULCI
DYNAMIC      -,0437      ,0751     -,2280      ,0640

********************* ANALYSIS NOTES AND ERRORS *********************

Level of confidence for all confidence intervals in output:
  95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

------ END MATRIX -----
```

Appendix C - Results of model testing - PROCESS procedure for SPSS (C2; N=53)

```
*************** PROCESS Procedure for SPSS Version 3.00 ****************

         Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**************************************************************************
Model  : 4
    Y  : GOALS
    X  : COMP
    M  : DYNAMIC

Sample
Size:  53

**************************************************************************
OUTCOME VARIABLE:
 DYNAMIC

Model Summary
         R       R-sq        MSE          F        df1        df2          p
     ,6393      ,4087      ,1989    35,2445     1,0000    51,0000      ,0000

Model
            coeff         se          t          p       LLCI       ULCI
constant    ,9695      ,5587     1,7351      ,0888     -,1523     2,0912
COMP        ,7766      ,1308     5,9367      ,0000      ,5140     1,0393

**************************************************************************
OUTCOME VARIABLE:
 GOALS

Model Summary
         R       R-sq        MSE          F        df1        df2          p
     ,6898      ,4759      ,1797    22,6983     2,0000    50,0000      ,0000

Model
            coeff         se          t          p       LLCI       ULCI
constant    ,6733      ,5465     1,2320      ,2237     -,4244     1,7710
COMP        ,5415      ,1617     3,3488      ,0015      ,2167      ,8663
DYNAMIC     ,3135      ,1331     2,3552      ,0225      ,0461      ,5808

************************* TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:
 GOALS

Model Summary
         R       R-sq        MSE          F        df1        df2          p
     ,6463      ,4177      ,1957    36,5878     1,0000    51,0000      ,0000

Model
            coeff         se          t          p       LLCI       ULCI
constant    ,9772      ,5542     1,7631      ,0839     -,1355     2,0899
COMP        ,7849      ,1298     6,0488      ,0000      ,5244     1,0455

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
    Effect         se          t          p       LLCI       ULCI       c_ps       c_cs
     ,7849      ,1298     6,0488      ,0000      ,5244     1,0455     1,3670      ,6463

Direct effect of X on Y
    Effect         se          t          p       LLCI       ULCI      c'_ps      c'_cs
     ,5415      ,1617     3,3488      ,0015      ,2167      ,8663      ,9430      ,4459

Indirect effect(s) of X on Y:
           Effect     BootSE   BootLLCI   BootULCI
DYNAMIC     ,2434      ,1173      ,0408      ,5041

Partially standardized indirect effect(s) of X on Y:
           Effect     BootSE   BootLLCI   BootULCI
DYNAMIC     ,4240      ,1886      ,0764      ,8226

Completely standardized indirect effect(s) of X on Y:
           Effect     BootSE   BootLLCI   BootULCI
DYNAMIC     ,2005      ,0904      ,0356      ,3959

********************** ANALYSIS NOTES AND ERRORS ***********************

Level of confidence for all confidence intervals in output:
  95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

------ END MATRIX -----
```