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A SCALE FOR MEASURING PROJECT CITIZENSHIP BEHAVIOR IN PROJECT-BASED DEFENSE INDUSTRY

PROJE TABANLI SAVUNMA SANAYİNDE PROJE VATANDAŞLIĞI DAVRANIŞINI ÖLÇMEYE YÖNELİK BİR ÖLÇEK

Yavuz KORKMAZYÜREK[1]

Abstract

Research and scales on the area of beneficial non task, behavior of employees are the topics that social scientists have generally focused on in order to contribute to the competitiveness of organizations. In addition, the ever-increasing number of inter-organizational project studies today have revealed the necessity of developing a reliable and valid scale for Project Citizenship Behavior (PCB). In this direction, this research consists of the basic stages of creating an item pool, developing a scale, and assessing reliability and validity. Cronbach's alpha coefficient for the entire scale was calculated as .81, and the originally designed 4-factor scale structure was confirmed as a result of confirmatory factor analysis. These results show that the developed PCB scale has both convergent validity and high reliability, but only partially discriminant validity. In conclusion, the phenomenon of PCB, which has been newly conceptualized as a result of a qualitative research, has been turned into a multidimensional valid scale from a sample of 288 participants that can be used in empirical research. In addition, this scale was developed by applying it only to project employees who represent the target audience.

Keywords: Project citizenship behavior, Project management, Inter-organizational cooperation, Organizational citizenship behavior.

Öz

Örgütlerin rekabet edebilirliğine katkıda bulunmak amacıyla, çalışanların görev dışı yararlı davranışları alanındaki araştırmalar ve ölçekler, sosyal bilimcilerin genel olarak üzerinde durdukları konulardır. Ayrıca, günümüzde sayıları sürekli olarak artan örgütler arası proje çalışmaları, Proje Vatandaşlık Davranışı (PVD) için güvenilir ve geçerli bir ölçek geliştirilmesi gerekliliğini de ortaya çıkarmıştır. Bu doğrultuda araştırmamız, madde havuzu oluşturma, ölçek geliştirme, geçerlik ve güvenirlik değerlendirme temel aşamalarından oluşmaktadır. Ölçeğin tamamına ait Cronbach alfa katsayısı .81 olarak hesaplanmış ve orijinal olarak tasarlanan 4 faktörlü ölçek yapısı, doğrulayıcı faktör analizi sonucunda doğrulanmıştır. Bu sonuçlar, geliştirilen PVD ölçeğinin hem yakınsak geçerliliğe hem de yüksek güvenilirliğe sahip olduğunu ancak kısmen ayırt edici geçerliliği sağladığını göstermektedir. Sonuç olarak, nitel bir araştırma sonucunda yeni kavramsallaştırılan PVD olgusu, ampirik araştırmalarda kullanılabilecek 288 kişilik bir örneklemden çok boyutlu geçerli bir ölçeğe dönüştürülmüştür. Ayrıca bu ölçek sadece hedef kitleyi temsil eden proje çalışanlarına uygulanarak geliştirilmiştir.

Anahtar Kelimeler: Proje vatandaşlığı davranışı, Proje yönetimi, Örgütler arası iş birliği, Örgütsel vatandaşlık davranışı.

[1] Dr. Öğr.Üyesi, Toros Üniversitesi, İktisadi, İdari ve Sosyal Bilimler Fakültesi, yavuz.korkmazyurek@toros.edu.tr, Orcid: 0000-0002-6722-8478

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Introduction

In recent years, the number of unique projects that many organizations in the Turkish defense industry have come together and tried to carry out has been increasing. In this context, the citizenship behaviors may exhibited by project employees play an important role in completing these projects on time and effectively. However, the attempt to create a theoretical organizational behavior framework in the context of projects is still ongoing (Li et al., 2019; Xia et al., 2018), and one of the important components of this effort is to shed light on the role of citizenship behavior in projects. Project Citizenship Behaviors (PCBs) are theoretically grounded in citizenship behaviors (Braun et al., 2013; Shafi et al., 2021). The PCB phenomenon can be expressed as citizenship behavior of project staff in relation to a particular project. In other words, the collaborative behavior of project staff that goes beyond contractual requirements (Braun et al., 2012). Thus, PCB pushes individuals to make more efforts, to be more efficient and effective (Basu et al., 2017).

Citizenship behavior may not be found only in permanent organizations (Guo et al., 2019). PCB manifests itself among employees from different organizations during inter-organizational projects. However, due to the temporary nature of projects, this feature can be seen as a barrier to PCB development at prima facie. Besides, PCBs are critical variables in the eventual success of projects built on time, cost and quality pillars (Korkmazyurek, 2022). Developing various instruments in order to get the maximum efficiency from the increasing number of projects today allows organizations to remain competitive. Beyond technological or procedural improvements, human, which is the most valuable production resource of organizations, play a key role at the point of achieving the desired goals in projects. In conclusion, PCB is one of the important variables that allow project-based structures to work more effectively and efficiently in intense rivalry business environment.

Employees in an organization are expected to fulfill specific roles shaped by their job descriptions and the expectations of their superiors. However, organizations also expect extra-role behavior (e.g., citizenship behavior) simultaneously from employees (Xia et al., 2022) that are not defined as part of their job duties, such as helping new colleagues adapt (Phuong & Dong, 2021). On the other hand, employee behavior is also important to the success of projects (Korkmazyurek, 2022). The prominent concepts in this context are harmony among project workers, identity of the project culture, formal behavior among workers, cooperation effectiveness, informal social constraints and reciprocity and mutual trust (He et al., 2022). Besides, the concept of PCB, which includes the notions of cooperation, loyalty, harmony and proactive behavior (Braun et al., 2012; 2013), can also play an important role in the timely and successful realization of projects. As a result, the operationalization of these concepts specific to projects will provide managers and practitioners with a practical instrument to use.

The skepticism in science, which starts with the search for the truth, is strengthened (Russell, 2008), and the existence of many factors that will affect the cause-effect relationships in the context of social sciences also strengthens these doubts. For this reason, the sine qua non of scientific progress based on measurement is the presence of precision measurement tools. In this context, in order to create a valid and reliable scale, it is necessary to study and interpret in accordance with many criteria and standards during the development and use of the scale. Otherwise, the validity and reliability of the scale will decrease, and the ground will be prepared for some mistakes and biases in studies where the scale is used at the national and even international level (Karakoç & Dönmez, 2014).

The number of project-based works that consume time, effort and resources is increasing day by day and the need for instruments that will help the effective functioning of these projects is also increasing. Besides, it is difficult to say that sufficient work has been

done on the newly conceptualized PCB phenomenon (see. Table 1). In this context, the study was undertaken with the following objectives: To develop a scale for measuring PCB; to standardize the scale and identify the factorial constitution of PCB. As a result, awareness of the critical role of PCB in project processes and the necessity of scales to measure these behaviors validly and reliably increase the importance of this study

Literature review

There are many different examples, called Organizational Citizenship Behavior (OCB), where employees in organizations assist other employees beyond their job descriptions (Bolino, 1999; Chen et al., 2002; Podsakoff & Mackenzie, 1994; Podsakoff et al., 2014). The behavior such as courtesy is spontaneous and does not result in any official reward (Organ 1988; Sharma & Jain, 2014). Within the framework of the classification made by Organ (1988), OCB consists of five dimensions. "*Courtesy" is the tendency to act proactively about potential organizational problems and to enlighten colleagues* (Organ, 1988). *"Sportsmanship"* dimension refers to an employee's defense of his organization and his concern for it (Lee & Allen, 2002). On the other hand, *"Altruism"* basically involves helping coworkers (Podsakoff et al., 2000). The fourth dimension, "*conscientiousness"*, involves fulfilling responsibilities and following rules (Podsakoff & MacKenzie, 1997). The last dimension, *"civic virtue",* is attending functions that are not required but help the organization's image and maintain its culture (Kidder, 2002).

In this context, the theoretical origins of Project Citizenship Behavior (PCB) are also based on OCB studies. OCB contributes to the organization's functioning by exhibiting behaviours beyond job descriptions, without being under any order or obligation (Bolino, 1999; Podsakoff et al., 2000). On the other hand, PCB is exhibited by project workers throughout the project (Guo et al., 2019), and helps perform tasks and solve problems not covered in contract regulations in projects (Braun et al., 2012). It is premature to say that there are enough studies to investigate the contextual and dispositional factors responsible for the emergence of PCB. The influence of organizations on this phenomenon is therefore limited and further research is required at this point. The four basic dimensions that make up the theoretical foundations of PCB concept are described in Table 2.

Table 2. Dimensions and definitions of PCB

"PCB Dimensions"	"Project-Specific Helping Behavior"	"Project Loyalty"	"Project Compliance"	"Project-Specific Proactive Behavior"
Definitions of Dimensions	- To fulfill the matters omitted in the contracts when necessary. - Behavior that is aimed at helping colleagues to solve existing problems in a temporary organization. - Ability to handle unforeseen events. - Developing practical solutions to problems. -Reciprocal support, coaching each other or offer additional assistance.	- Engaging in collaborative behavior by following common project goals. - Demonstrate full commitment and responsibility to ad hoc organization for the benefit of the project. -Prioritize the project success. - The individual's voluntarily sharing (e.g., information, experience) with other project employees.	-Easy orientation of the individual to the processes, rules and policies of the temporary organization. - Increasing the credibility of the employee by complying with the rules determined in the project. -Meeting the expectations without the need for an additional audit. -Following rules of engagement/ cooperation	- Completion of the tasks in the project by the creative and innovative efforts of the employee beyond the contract. -Attracting the project leader's attention for potential improvement opportunities. -To be enthusiastic about taking part in the project.
Example	A project worker assisting another project colleague in solving a problem even though he is not in his/her contract.	An Individuals' defensive attitude when an outside criticism comes to his/her project.	Individuals' compliance with the quality standards and rules set for the project.	Individuals' suggestions for various improvements to project processes, services and similar activities.

Source: Adapted from (Braun et al. 2012; Braun et al. 2013).

Based on the qualitative research of Braun et al.'s (2012; 2013), the dimensions of PCB described above are normative expectations regarding the behaviors of project workers to be competent during the time-limited project period. Besides, Braun et al. (2012) also drew attention to two main issues: First, they interpreted the data according to the context of the interview, and second, the whole coding process was performed by two coders to ensure reliability.

As a result of the above-mentioned theoretical discussions, in this study, the survey questions prepared to measure project citizenship behavior were compiled by synthesizing the studies in Table 1.

Table 1. Basic studies to measure the behavior of employees in projects

Project Citizenship Behavior (PCB) Corresponding Research:	**Basic concepts**	
Braun et al., (2012; 2013) Guo et al., (2019) Shafi et al., (2019) Xia et al., (2018)	*-Alturizm* *-Compliance* *-Civic virtue* *-Conscientiousness* *-Courtesy* *-Loyalty*	*-Related loyalty* *-Proactive relationship management* *-Self-development* *-Team work* *-Team mindedness* *-Tolerance*

The dimensions of PCB

PCBs are theoretically grounded in organizational citizenship behaviors research. PCB is an implicit multidimensional construct consisting of four different related behaviors commonly seen in projects:

Project specific helping behavior is essential in project-based temporary establishments (Braun et al., 2013), and helping behavior have positive effects on the continuity of the established relations as well as the duration and quality, which are important pillars of the projects (Guo et al., 2019). This dimension also includes helping other organizational employees who are partners of the project while working on the same project (Shafi et al., 2021).

Project loyalty includes possessive, collaborative, plain dealing, and altruistic behavior (Braun et al., 2012; 2013). If we define this dimension in a broader context, it is the acceptance of the project objectives by the project employees, their readiness to spend a significant amount of energy on the project, and a high level of willingness to remain a part of the project (Hoegl, Weinkauf & Gemuenden, 2004). As a result, maintaining relationships and loyalty among project members helps keep human relationships between them healthy and easily reactivated when new projects begin (Braun et al., 2012).

Project compliance *"*is an extension of organizational compliance in the project context" (Guo et al., 2019, p. 4). In this context, this dimension refers to the level of compliance of the project worker with the set of formal and informal rules created for the project (Shafi et al., 2021). Compliance behavior is conceptualized as doing the job without the need for extra supervision (Braun et al., 2012). A high level of project-based compliance behavior is important for team members to better comply with the project's operating procedures and regulations (Guo et al., 2019).

Project specific proactive behavior. Proactive behavior includes individual initiatives and civic virtue behaviors of project team members coming together from different organizations (Shafi et al., 2021). Employees with proactive personality structure show individual initiative, their contributions are constructive, they seek new opportunities and contribute to organizations by producing new ideas. In other words, sometimes project workers can criticize the status quo by reflecting constructively to get a better solution. In this context, project members can explore potential project opportunities or proactively make suggestions based on their own experiences, aiming to optimize the implementation of the project (Xia et al., 2017).

The necessity of PCB in terms of project success and its key differences from OCB

According to Standish Group's Chaos Report, when the data of 320 projects with a budget of approximately 640 million USD are analyzed, it is seen that 48% of the projects were completed successfully, while 45% either exceeded the budget or were not fully completed on time. For this reason, the problems that cannot be fully clarified in terms of successful completion of the projects continue (Bilir & Yafez, 2021). Therefore, it can be said that there is a continuing need for studies that will contribute to the success of the projects or that will provide different instruments to the practitioners at the point of effective management of the projects. On the other hand, reasons such as lack of commitment, poor communication practices, inappropriate recognition system/culture, partial cooperation by employees are prominent project failure factors in the study of Antony et al. (2019) on 49 Brazilian producers. In this respect, it can be said that the concepts of commitment behavior, high level of communication or cooperation desired by organizations are also closely related to citizenship behaviors (Pletzer et al., 2021). However, the dynamic nature of projects requires more proactive behavior. Besides, due to the fact that projects take place within a limited time frame there is also a need for compliance behavior without the need for extra supervision. In conclusion, owing to these unique features of the projects, it can be stated that project roles differ in specific points (e.g., time) from the concept of OCB or in other words organizational roles, the scope of which covers all organizations.

An overview of the Turkish defense industry in the context of projects

Today, as a result of the determination and dedication of Türkiye's engineers, technicians, workers and companies, the Turkish defense industry has become a multi-billion-dollar industry characterized by technological innovations and global influence. After the 2000s "projects such as the Armored Combat Vehicle, Small Cargo Aircraft, Beginner Trainer Aircraft, and Cougar Helicopter came to the fore" (Demir, 2020, p. 27). In this context, there was also an inclination toward a partial design initiative in those platforms mentioned above. The meaning of these partial design initiatives is that businesses *(expert in the field)* come together on various main platforms and form project teams. As a result, the number of these initiatives is increasing today and the important function of PCB should not be ignored in the efficient operation of projects in terms of performance, time and resources.

Research methodology

Social science research subjects are not as understandable, observable and measurable as in natural sciences. In this context, qualitative methods that try to understand why and how human behaviors occur help researchers. In this context, qualitative methods were also used in shaping the concept of PCB (Braun et al., 2012). In this context, in this study, qualitative and quantitative methods were used to take advantage of both research methods for a comprehensive evaluation of the items connection of the related structure of PCB.

PCB may also occur in projects (Hobday, 2000) that involve actors from different organizations, i.e., inter-organizational project. Braun et al. (2012) who carried out the only conceptual study on project citizenship behavior in the literature, added participants from "temporary organizations" and formed the sample of this research. However, it should be taken into account that "temporary organizations" have a wide scope beyond the project studies. On the contrary, this study specifically conceptualized project citizenship behavior and turned it into a functional scale. In addition, this scale development study was only applied to employees from different defense industry organizations who came together for project-based works.

Questions designed to measure the PCB dimensions

The questions of the PCB survey were generated by synthesizing the findings of Braun and his friends (2012) as a result of a comprehensive qualitative research. In addition, we also followed Hinkin's (1995 roadmap with three main stages in the survey development process:

Item generation. In this step we have to ensure "content validity" by using only the content related to the phenomenon to be measured. Hinkin (1995) also proposes a deductive approach at this stage that makes a clear link between the questions and their theoretical fields. We have adapted this approach based on the basic dimensions of the PCB while creating the questions.

Scale development. Scale construction and reliability assessment are divided into four. In the first step the sample should be representative of the main study population. Thus, we applied our survey only to the project employees. Second, adequate domain sampling is necessary for obtain content and construct validity. Third, the scale generates sufficient variance among respondents. The fourth step is to ensure sufficient sample size with at least 200 respondents in order to make a confirmatory factor analysis (Hinkin, 1995). We have met this requirement with more than 265 participants, and the scale generated sufficient variance among respondents.

Item Reduction and Assessment of Scale Dimensionality. According to The American Psychological Association (Hinkin, 1995), measures should certify "internal consistency" and "construct validity". "Construct validity" is the degree to which a set of measured variables truly represent the theoretical latent construct they are designed to measure (Hair et al., 2006). A 21-item draft questionnaire was obtained as a result of content and face validity studies from the 42-item pool of questions. It is also seen that we provide the "construct validity" with the questions obtained from the PCB dimensions, which we have presented with examples in Table 1. In addition, the "face validity" of the survey questions was tested with 2 university professors who were known to be familiar with inter-organizational studies. While designing the scale items, care was taken to ensure that the items were simple and understandable, and that an item should not have more than one judgment or expression of thought. Hence, homogeneous distribution of the scale items among themselves is observed and "internal validity" is ensured in this way. The survey questions designed to measure PCB dimensions are shown in Table 2 below.

Table 2. Questions designed to measure the PCB dimensions

No.	Dimensions
I	Project Specific Helping Behavior
Q8	When I see a problem during the execution of the project, even though it is not included in my task description, I try to get involved in and solve
Q3	I mentor other project members in solving their problems or achieving their work.
	When a problem occurs in the project, even if I do not have enough resources, I look for alternative ways to solve the problem.
Q11	I give importance to solidarity between the members during the execution of the project.
Q2	When I face an unexpected problem in my project, I have confidence that I will overcome it.
Q1	I ask my project members if there is anything that I can help.
II	Project Loyalty
Q16	I am cooperative in achieving the common goals of the project that I work on.
Q7	Even when I have other things to do, I give priority to the project that I work on.

Q12	I show commitment to the project I work on.
Q15	I have a bond with the project I am assigned to and I identify myself with it.
	I share knowledge and experience with other project members in a voluntary basis.
Q17	I get defensive when an outside criticism comes to the project I work on.
III	Project Compliance
Q13	I can easily adapt to the quality processes, policies and rules determined during the project.
Q5	I follow the rule set in the project, so that other project members find me reliable.
	I fulfill all of my responsibilities in the project without the need for additional supervision.
Q9	During the execution of the project, I fulfill the requirements of the joint work obligations.
IV	Project-Specific Proactive Behavior
Q10	I contribute to the execution of the project by making creative suggestions.
Q14	I make continuous improvement suggestions for my project (e.g., process, quality).
Q4	When there is a problem at my project, I come up with creative solutions.
	My improvement suggestions/creative solutions attract the attention of my project manager.
Q6	I work with enthusiasm on my project.

Source: Adapted from (Braun et al. 2012; Braun et al. 2013).

The created item pool was evaluated based on Davis technique by 2 professors who are experts in their fields in terms of the necessity, clarity and specificity of the questions. Items in the Davis technique; It is rated on four scales as “appropriate”, “item should be slightly revised”, “item should be seriously reviewed” and “item not suitable”. In this technique, the “content validity index” for the item is obtained by dividing the number of experts who marked the options for items to be appropriate and for the item to be slightly revised by the total number of experts. If this value is 0.80, it means an acceptable level (Karyagina & Kukhtova, 2016). Accordingly, some statements were changed, and it was decided to exclude items 3, 11, 15 and 20 from the scale. As a result of these processes, the Davis index was calculated as 0.94. Finally, it was agreed that the PCB concept in its final form in Table 2 is adequately represented and provides “content validity”.

The statements loaded on our first factor, "project-specific helping behavior", are related to the assistance provided to a colleague and also measure the approach towards ensuring mutual solidarity and workflow. Another factor of the survey, "project loyalty", includes questions to measure the collaborative attitudes of the project employee, the level of sense of ownership of the project he/she works for and the loyalty he/she shows to the project. The third factor, "project compliance", measures the level of compliance of the project employee with the determined rules and procedures, performing his/her responsibilities without being dependent on a control mechanism, and whether he/she is perceived as reliable accordingly. The "project-specific proactive behavior" dimension, which is the last factor of the survey, generally measures the level of innovative approaches that the employee put forward during the project and the problems he/she solves accordingly. In conclusion, it is seen that the questions in the measurement tool are clearly related to the subject examined and "face validity" is ensured. On the other hand, the functional structure of the scale also provides us "translation validity".

Internal consistency refers to the extent to which item responses correlate with the total scores (Hinkin, 1995). In this context, the correlations of the variables in the same

dimension were examined (See Table-4), and it is seen that the correlations are high and significant in all dimensions ($p<0.01$).

Measures

We used google form internet survey tool. A 5-point Likert scale (5="strongly agree", 1= strongly disagree") or (5="always", 1="never") was used for all project based citizenship behavior items in order to measure the extent of the respondent's agreement with each item. In order to get more accurate answers from the participants in the survey, the options in some dimensions range from "strongly disagree" to "strongly agree", while the options in other dimensions are "never" to "always" were created. Consequently, a higher score indicated stronger agreement. The majority of the participants work in the Turkish aerospace industry, Aselsan and Roketsan companies, which are among the leading defense industry companies in Turkey. 305 responses were received from 450 questionnaires sent within the scope of the research, and as a result of examining the returned questionnaires in terms of missing data and extreme values, it was decided to remove 17 questionnaires. As a result, our sample consisted of 288 people.

Statistical results

Validity

A large sample size (>150) is generally considered to be adequate for exploratory factor analysis, where scale development is the main goal (Guadagnoli & Velicer, 1988). In this context, the answers were collected at the lowest and highest values, and the questionnaires with missing values were excluded from the study and analyzes were made on the results of 288 valid questionnaires. After creating an item pool and taking expert opinions Exploratory Factor Analysis (EFA) was applied on the data to verify the predicted factor structure of the PCB scale. Afterwards the convergent and discriminant validity of the scale was checked. The EFA results are given in Table 3.

The data of the PCB scale were subjected to Exploratory Factor Analysis (EFA) to examine the construct validity. For this purpose, Kaiser Mayer Orkin (KMO) and Bartlett tests were performed and the KMO sample suitability test result was found to be 0.882, and the Barlett normal distribution test result gave significant results ($p<0.05$). These values indicate that the sample size is sufficient, and the data show normal distribution. When the EFA results were evaluated, a four-factor structure with an eigenvalue greater than 1 emerged (see. Table 3).

Table 3. Factor loading values of project citizenship behavior factors

Factors[b]	**Factor Load**
	EFA Main Sample (N=288)
Project-Specific Helping Behavior	Eigenvalue % Variance
Q8	6.023 31,512
Q2	0.878
Q1	0.772
Project Loyalty	0.853
Q16	1.523 8,011
Q7	0.884
Q12	0.680
Q17	0.702
Project Compliance	0.680
Q13	2.849 12,834
Q5	0.702
Q9	0.811
Project-Specific Proactive Behavior	0.710
Q10	1.492 6,696
Q14	0.731
Q4	0.786
Q6	0.634
	0.798

Notes: [a] Loadings below 0.400 are suppressed to enhance clarity; [b] Extraction method: principal component Rotation method: Varimax with Kaiser Rotation converged in 5 iterations

In order to determine the convergent validity of the scale, the correlations of the variables in the same dimension were examined (Table-4).

Table 4. Inter-item correlations and descriptive statistics

Dimension		Mean	Std. Dv.	Q8	Q2	Q1	Q16	Q7	Q12	Q17	Q13	Q5	Q9	Q10	Q14	Q4	Q6
Gender		3,17	1,04														
Age		1,42	,495														
Work Exp.		2,35	,969														
Occupation		1,07	,266														
Position		1,36	,789														
Helping	Q8	3,91	,873	-													
	Q3	3,95	,862	,480**													
	Q11	4,06	,850	,247**													
	Q2	4,10	,765	,201**	-												
	Q1	4,15	,819	,375**	,171**	-											
Loyalty	Q16	4,36	,770	,363**	,216**	,111**	-										
	Q7	4,03	,674	,183**	,141**	,183**	,188**	-									
	Q12	4,31	,882	,341*	,311**	,149**	,212**	,549**	-								
	Q15	3,75	,924	,153**	,152	,331	,080	,419**	,465**								
Compliance	Q17	3,20	,808	,341**	,346	,076	,142*	,415**	,254**	-							
	Q13	3,90	,714	,310**	,054	,448**	,131*	,294**	,238**	,169**	-						
	Q5	4,18	,565	,190	,400	,254**	,139	,065	,179**	,076	,354**	-					
	Q9	4,10	,781	,159**	,233**	,286**	,462**	,236**	,287**	,093	,334**	,400**	-				
Proactive	Q10	4,04	,781	,199**	,441**	,543	,189**	,122	,580	,207	,326	,199	,211**	-			
	Q14	3,86	,818	,149*	,373**	,288**	,256**	,379	,387**	,312**	,340	,170	,145*	,553**	-		
	Q4	3,88	,740	,179**	,230**	,368**	,232**	,500	,321*	,080	,232	,205**	,484**	,530**	,572**	-	
	Q6	3,97	,771	,321**	,428**	,359**	,098	,276**	,270**	,408**	,449**	,266**	,306**	,278**	,371**	,400**	-

Gender (1 = M, 2 =F), age (1 = <21, 2 = 22–30, 3 = 41–50, 4= 51–60, 5= >60), work experience (1 = <5, 2 =6-10, 3=11-20, 4=>20), occupation (1 = private sector, 2= public sector), position (1=employee, 2= manager, 3= self employed, 4= student).* p<0.05. **p<0.01

When the correlation values in the table are examined, it is seen that the correlations are high and significant in all dimensions ($p<0.01$). In order to determine the discriminant validity of the scale, the correlations of the variables in different dimensions were examined. For the scale to have discriminant validity, these correlations should be low and not significant (Rönkkö & Cho, 2022). When the values in the table are examined, it is seen that some items meet this condition. As a result, it can be stated that the PCB scale has partial discriminant validity. OCB dimensions could not be completely separated from each other in many studies and were evaluated as two-dimensional in some studies (Henderson et al., 2020; Smith et al., 1983). In addition, the theoretical foundations of the PCB concept are also based on OCB. Consequently, it can be said that it is an acceptable deficiency that the scale does not fully provide discriminant validity.

Confirmatory Factor Analysis (CFA):

Confirmatory factor analysis (CFA) was conducted using the AMOS 18 package program to test the construct validity of the project citizenship behavior scale. Statistical values regarding the fit of the structural equation model are shown in Table 5.

Table 5. Statistical Values for the Fit of the Structural Equation Model

Fit Statistics	**Perfect Fit**	**Acceptable Fit**
X2/sd	≤ 3	4-5
RMR	≤ 0,05	0,06-0,10
RMSEA	≤ 0,05	0,06-0,08
GFI	≥ 0,90	0,89-0,85
CFI	≥ 0,90	0,89-0,85

Source: Harrington, D. (2009). *Confirmatory factor analysis*. Oxford University Press.

Being over 0.90 is a criterion that the scale has a good fit (Harrington, 2009; İlhan & Çetin, 2014). The values below show that the comparative fit indices of the PCB scale in modified model (related) have an acceptable fit (GFI=0,932). The confirmatory factor analysis results of the PCB scale are presented in Table 6.

Table 6. Goodness of Fit Values for the Construct Validity of the Project Citizenship Behavior Scale

Model	$\Delta\chi^2$	$\Delta\chi^2$/sd	RMSEA	CFI	GFI	RMR
Single Factor	1229,507	8,054	0,107	0,631	0,801	0,244
Unrelated	1115,299	7,312	0,101	0,710	0,843	0,156
Related	967,110	3,288	0,069	0,982	0,932	0,070
Second Level Multifactor	935,510	6,729	0,086	0,761	0,860	0,101
Modified Model (Related)	463,700	6,121	0,093	0,773	0,869	0,112

RMSEA = Root Mean Square Error of Approximation; CFI= Comparative Fit Index; GFI = Goodness of Fit Index.
* $p<0.05$

According to the confirmatory factor analysis results, the PCB scale shows the best fit in the related model ($\Delta\chi^2$/df=3.228; RMSEA=0.069; CFI=0.982; GFI=0.932; RMR=0.070).

Reliability

The reliability of an instrument is it ability to produce consistent results each time (Hinkin, 1995). The Cronbach alpha values calculated for PCB dimensions vary between 0.77 and 0.86 seen in Table 7.

Table 7. Reliability Values of Project Citizenship Behavior Dimensions

Dimension	**Reliability**
Project Specific Helping Behavior	0.86
Project Loyalty	0.80
Project Compliance	0.84
Project-Specific Proactive Behavior	0.77
TOTAL	**0.81**

The factor loadings of individual items and their effects on internal consistency reliability were examined, and the total reliability of the PCB scale was found to be .81 out of 288 respondents. PCB phenomenon, whose theoretical origins are based on OCB studies. However, PCB is a different subject from OCB. Thus, an OCB scale is also included in our analysis to see the conceptual and statistical differences between PCB and OCB.

Table 8. Comparison of PCB data with OCB

Factor / Nguyen et al., 2021	**Alpha**	**Variance**	**N.of items**	**Alpha**	**Variance**	**N. of items**	**Alpha**	**Variance**	**N. of items**
Altruism	0.957	18.8	4						
Conscientiousness	0.931	17.9	4						
Sportsmanship	0.950	17.8	4						
Courtesy	0.740	16.4	3						
Civic virtue	0.903	10.6	4						
Factor / Henderson et al., 2020									
"**Item 2** I helped others with heavy workloads"				-	-	1			
"**Item 4** I assisted my supervisor with his/her work when not asked"				-	-	1			
"**Item 6** I took a personal interest in other employees"				-	-	1			
"**Item 8** My attendance at work was above the norm"				-	-	1			
"**Item 9** I gave advance notice when I was unable to come to work"				-	-	1			
"**Item 13** I conserved and protected organizational property"				-	-	1			
Factor / PCB									
Project Specific Helping Behavior							0.86	31,5	5
Project Loyalty							0.80	8,0	5
Project Compliance							0.84	12,8	3
Project-Specific Proactive Behavior							0.77	6,6	4

* Values not specified in studies are '.' shown with.

In addition to a recent study using Organ's (1988) five-dimensional OCB scale, which is used as a basis for measuring OCB in organizational behavior studies, statistics from another recent study that developed a revised shorter OCB scale (Henderson et al., 2020) are compared with PCB results in Table 6. When the items in Henderson et al., (2020) study are examined, it is seen that the scope of the statements is general in scope. On the other hand, looking at the statements in the PCB study (see. Table 2), it is seen that they are prepared in a narrower scope specific to projects. In addition, considering the alpha values and the variances explained by the items of citizenship behaviors in the Table 8, it can be said that the participants understood the expressions.

Conclusions and future research directions

There are 112 studies published about PCB in the context of business and management on Web of Science. This figure is not very high. Therefore, the purpose of this research was also to point out some light on the PCB research. On the other hand, as it is known, measurement tools used in social research they are always open to problems that may arise due to cultural differences. Differences between the culture of the country where the scale was prepared and the country where the application will be made may threaten the validity of the research. This situation necessitates validity and reliability studies in the context of scale development studies. From this point of view, within the scope of our research, first, the factor structure was examined by applying exploratory factor analysis to the data, and then the convergence and divergence validity were investigated. In the second stage, as a result of the confirmatory factor analysis, a four-factor structure was discovered, like Braun et al. (2013), which is one of the main studies on measuring the behavior of employees in projects (See Table 1). In this context, our PCB scale shows the best fit in the related model structure (GFI=0.932).

In the third stage of the study, to test the reliability of the scale, Cronbach's alpha coefficients were calculated both separately for all dimensions and as a total for the whole scale. The reliability coefficients calculated for the dimensions were found to be between 0.77 and 0.86. The total reliability of the scale was found to be 0.81. To determine the convergent validity of the scale, the correlations of the variables in the same dimension were examined, on the other hand, to determine the discriminant validity, the correlations of the variables in the different dimensions were also examined. Correlation results revealed that the scale had convergent validity, but partially provided discriminant validity. The fact that scale dimensions could not be completely separated from each other in many previous studies conducted to measure citizenship behaviors (e.g., Phuong & Dong, 2021; Sharma & Jain, 2014) may indicate that the scale's lack of discriminant validity is an expected result. As a result, the PCB scale is a valid scale for future research since it has a four-dimensional factor structure and has convergent validity.

“PCB plays a decisive role for outcomes such as project goal achievement and future opportunities that are highly relevant for international human resource management in an increasingly projectified world.” (Ferreira et al., 2013, p.3788). Although the weight of the projects on a global scale is increasing, it is seen that there are not enough studies in the literature on project-oriented citizenship behaviors that will contribute to the success of the projects. Therefore, it is thought that the PCB scale revealed in this study will make significant contributions to both practitioners and the field. In conclusion, we may say that there is also a need for more theoretical studies that will improve our conceptual understanding about PCB. In future studies on this subject, using multiple sources in projects such as supervisors, personal evaluations, co-workers, and subordinates within the same sample group and discussing the results will also make significant contributions to PCB research. Besides, it is important that the questions are based on qualitative research with in-depth interviews so that the item pool produced in the context of this study can adequately capture the concept of PCB. In conclusion, the PCB literature is limited to a few studies. Therefore, this PCB scale is useful for future empirical research efforts about related areas and will foster the knowledge base.

References

Antony, J., Lizarelli, F. L., Fernandes, M. M., Dempsey, M., Brennan, A., & McFarlane, J. (2019). A study into the reasons for process improvement project failures: results from a pilot survey. *International Journal of Quality & Reliability Management*. https://doi.org/10.1108/IJQRM-03-2019-0093

Basu, E., Pradhan, R. K. & Tewari, H. R. (2017). Impact of organizational citizenship behavior on job performance in Indian healthcare industries. *International Journal of Productivity and Performance Management.* 66(6), 780-796. https://doi.org/10.1108/IJPPM-02-2016-0048

Bolino, M. C. (1999). Citizenship and impression management: Good soldiers or good actors? *Academy of Management Review*, 24, 82-98. https://doi.org/10.5465/amr.1999.1580442

Braun, T., Müller-Seitz, G., & Sydow, J. (2012). Project citizenship behavior? - An explorative analysis at the project-network-nexus. *Scandinavian Journal of Management,* (28), 271-284. https://doi.org/10.1016/j.scaman.2012.05.008

Braun, T., Ferreira, A. I., & Sydow, J. (2013). Citizenship behavior and effectiveness in temporary organizations. *International Journal of Project Management*, 31(6), 862-876. https://doi.org/10.1016/j.ijproman.2012.09.003

Chen, X. P., Lam, S. K., Schaubroeck, J., & Naumann, S. (2002). Group organizational citizenship behavior: A conceptualization and preliminary test of its antecedents and consequences, In *Academy of Management Proceedings* (pp. K1-K1). Academy of Management. ISSN: 0896-7911

Demir, I. (2020). Transformation of the Turkish Defense Industry. *Insight Turkey*, *22*(3), 17-40. https://doi.org/10.25253/99.2020223.02

Ferreira, A.I., Braun, T., & Sydow, J. (2013). Citizenship behaviour in project-based organizing: comparing German and Portuguese project managers. *The International Journal of Human Resource Management*, 59, 3, 404-430. https://doi.org/10.1080/09585192.2013.777937

Guadagnoli, E., & Velicer, W. F. (1988). A comparison of several factor matching indices: a simulation study, *Multivariate Behavioral Research*, 26(2), 323-43. https://doi.org/10.1108/09574090910981314

Guo, S., Wang, X., Fu, L., & Liu, Y. (2019). How individual's proactive behavior helps construction sustainability: Exploring the effects of project citizenship behavior on project performance. *Sustainability* (11) 6922, 2 18. https://doi.org/10.3390/su11246922

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (Vol. 6): Pearson Prentice Hall Upper Saddle River.

Harrington, D. (2009). *Confirmatory factor analysis*. Oxford University Press.

He, Z., Wang, G., Chen, H., Zou, Z., Yan, H., & Liu, L. (2022). Measuring the construction project resilience from the perspective of employee behaviors. *Buildings*, *12*(1), 56. https://doi.org/10.3390/buildings12010056

Henderson, A. A., Foster, G. C., Matthews, R. A., & Zickar, M. J. (2020). A psychometric assessment of OCB: Clarifying the distinction between OCB and CWB and developing a revised OCB measure. *Journal of Business and Psychology, 35*(6), 697-712. https://doi.org/10.1007/s10869-019-09653-8

Hinkin, T. R. (1995). A review of scale development practices in the study of organizations, *Journal of Management*, 21(59), 67-88. https://doi.org/10.1177/014920639502100509

Hobday, M. (2000). The project-based organization: An ideal form for managing complex products and systems. *Research Policy*, 27, 871-893. https://doi.org/10.1016/S0048-7333(00)00110-4

Hoegl, M., Weinkauf, K., & Gemuenden, H. G. (2004). Interteam coordination, project commitment, and teamwork in Multiteam R&D projects: A longitudinal study. *Organization. Science*. 15(1), 38-55. https://doi.org/10.1287/orsc.1030.0053

İlhan, M., & Çetin, B. (2014). LISREL ve AMOS programları kullanılarak gerçekleştirilen Yapısal Eşitlik Modeli (YEM) analizlerine ilişkin sonuçların karşılaştırılması. *Eğitimde ve Psikolojide Ölçme ve Değerlendirme Dergisi,* 5(2), 26- 42.

Karakoç, A. G. D. F. Y., & Dönmez, L. (2014). Ölçek geliştirme çalışmalarında temel ilkeler. *Tıp Eğitimi Dünyası*, *13*(40), 39-49. https://doi.org/10.25282/ted.228738

Karyagina, T. D., & Kukhtova, N. V. (2016). M. Davis Empathy Test: Content validity and adaptation in cross-cultural context. *Counseling Psychology and Psychotherapy*, *24*(4), 33-61. https://doi:10.17759/cpp.2016240403

Kidder, D. L. (2002). The influence of gender on the performance of organizational citizenship behaviors. *Journal of Management*, *28*(5), 629-648. https://doi.org/10.1177/014920630202800504

Korkmazyurek, Y., & Korkmazyurek, H. (2022). The gravity of culture on project citizenship behaviors. *Current Psychology*, 1-13. https://doi.org/10.1007/s12144-022-03849-7

Lee, K., & Allen, N. J. (2002). Organizational citizenship behavior and workplace deviance: The role of affect and cognitions. *Journal of Applied Psychology*, 87(1), 131-142. https://doi.org/10.1037/0021-9010.87.1.131

Li, Y., Lu, Y., Cui, Q., & Han, Y. (2019). Organizational behavior in megaprojects: Integrative review and directions for future research. *Journal of Management in Engineering*,*35*(4), 04019009. https://doi.org/10.1061/(ASCE)ME.1943-5479.0000691

Phuong, N. N. D. (2021). Organizational citizenship behavior: Scale development and validation. *Ho Chi Minh City Open University Journal of Social Sciences*, *11*(1), 15-24. https://doi.org/0.46223/HCMCOUJS.soci.en.11.1.1904.2021

Organ, D. W. (1988). *Organizational citizenship behavior: The good soldier syndrome*. Lexington books/DC heath and com. 45-48, 94.

Phuong, N. N. D., & Dong, L. N. T. (2021). Organizational citizenship behavior: Scale development and validation. *Social Sciences*, 11(1), 15-24. https://doi.org/10.46223/HCMCOUJS.soci.en.11.1.1904.2021

Podsakoff, P. M., & Mackenzie, S. B. (1994). Organizational citizenship behaviors and sales unit effectiveness, *Journal of Marketing Researh*, 31(3), 351-364. https://doi.org/10.1177/002224379403100303

Podsakoff, P. M., & MacKenzie, S. B. (1997). Impact of organizational citizenship behavior on organizational performance: A review and suggestion for future research. *Human Performance,* 10(2), 133-151. https://doi.org/10.1207/s15327043hup1002_5

Podsakoff, P. M., MacKenzie, S. B., Paine, J. B., & Bachrach, D. G. (2000). Organizational citizenship behaviors: A critical review of the theoretical and empirical literature and suggestions for future research. *Journal of Management*, 26(3), 513-563. https://doi.org/10.1016/S0149-2063(00)00047-7

Podsakoff, N. P., Podsakoff, P.M., Mackenzie, S. B., Maynes, T. D., Spoelma, T. M. (2014). Consequences of unit-level organizational citizenship behaviors: A review and recommendations for future research, *Journal of Organizational Behavior*, 35, 87-119. https://doi.org/10.1002/job.1911

Rönkkö, M., & Cho, E. (2022). An updated guideline for assessing discriminant validity. *Organizational Research Methods*, *25*(1), 6-14. https://doi.org/10.1177/1094428120968614

Russell, B. (2008). *Russell Revisited: Critical Reflections on the Thought of Bertrand Russell*. (ed. Swhwerin, A). Cambridge Scholars Publishing, ISBN: 1-84718-494-4

Shafi, M. Q., Iqbal, R., Shahzad, K., & Unterhitzenberger, C. (2021). The mediating role of project citizenship behavior in the relationship between organizational justice dimensions and project success. *Project Management Journal*, *52*(6), 547-562. https://doi.org/10.1177/87569728211026423

Sharma, V., & Jain, S. (2014). A scale for measuring organizational citizenship behavior in manufacturing sector. *Pacific Business Review International*, *6*(8), 57-62.

Skinner, L. R., Autry, C. W., Lamb, C. W. (2009). Some measures of interorganizational citizenship behaviors: Scale development and validation. *International Journal of Logistics Management.* 22, 228–242. https://doi.org/10.1108/09574090910981314

Smith, C., Organ, D. W., & Near, J. P. (1983). Organizational citizenship behavior: Its nature and antecedents. *Journal of Applied Psychology*, *68*(4), 653. https://doi.org/10.1037/0021-9010.68.4.653

Xia, N., Zhong, R., Wang, X., & Tiong, R. (2018). Cross-domain negative effect of work-family conflict on project citizenship behavior: Study on chinese project managers. *International Journal of Project management*. 36, 512-524. https://doi.org/10.1016/j.ijproman.2017.11.005

Xia, N., Ding, S., & Yuan, J. (2022). The impact of a challenging work environment: Do job stressors benefit citizenship behavior of project managers?. *International Journal of Project Management*, *40*(3), 205-217. https://doi.org/10.1016/j.ijproman.2022.01.007