



# A higher-order job crafting mediation model with PLS-SEM: relationship between organizational identification and communication satisfaction

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## Abstract

In recent years, global events have redefined working life, stimulating new organizational models. This work focuses on job crafting, which is considered the way to improve the relationship between some organizational variables and other individual variables such as organizational identification and satisfaction with communication, both of which are crucial to achieving sustainable levels of well-being. The study examines the role of latent constructs that can promote adaptive responses as well as their relations. In particular, we focus on organizational identification in promoting adaptive responses, including the increase in structural resources, the increase in challenging demands, and the increase in social resources as adaptive strategies to improve satisfaction with communication. The analysis is carried out using robust statistical techniques that are suited to the study of causal relations between abstract constructs. Specifically, after Confirmatory Composite Analysis (CCA-PLS) to evaluate the quality of the data collected, a higher order mediation model, based on partial least squares structural equation modeling (PLS-SEM), was performed to test the mediation role of the job crafting. In addition, we prioritize such latent constructs using importance–performance map analysis (IPMA) to evaluate the relevance and performance of each construct of this model. The results show a relationship between organizational identification, corresponding to a high sense of belonging, and communication satisfaction at all levels through the mediation of job crafting.

**Keywords** Structural equation modeling · Importance and performance · Partial least squares · Job crafting · Organizational identification · Communication satisfaction · Mediation model · PLS-SEM · Higher order modeling

## 1 Introduction

The events that have characterized the last 3 years have strongly pushed towards a new organizational structure in working contexts. The Covid-19 health emergency required the identification of new methods to ensure administrative and economic continuity activities and, at the same time, protect public health (Langè and Gastaldi 2020). Government regulations have required organizations to adapt their practices to contain the spread of the virus; consequently, many companies tried to cut costs to manage the risks derived from the outbreak by reducing the benefits, modifying types

of contracts, and, in any case, leading to staff cuts (Borden et al. 2020). The methods adopted during the health emergency involved both private workers and the Public Sector, and they mostly envisaged the use of smart working methods. This change has redrawn the boundaries of work activity, triggering the definition of a more modern organizational model. The objectives of smart working have always included an improvement in productivity and work-life balance and, consequently, an increase in the well-being of the workers (Langè and Gastaldi 2020).

Instead, the necessity, compulsoriness, and top-down methods of alternative working ways such as remote working, if at first they made it possible to contain contagion and preserve public health, in the long term led to a need for re-education in work and mature use of social and structural resources; furthermore, the current urgency for organizations has become that of rebuilding a worker–organization relationship and developing a new identification with their own

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company. For this reason, managing employees' organizational identification (from here, OI) appears to be a crucial success factor for promoting well-being and job satisfaction. In this context, our research interest lies in examining the role of latent constructs, such as Job Crafting, Organizational Identification, and Communicative Satisfaction, as critical drivers of adaptive responses to uncertainty and changing work environments. We aim to explore how these constructs influence employees' ability to adapt, find satisfaction, and maintain their sense of identity within their organizations amidst evolving and uncertain situations.

## 1.1 Organizational identification

Organizational identification has been considered by researchers, both as a process of identification and because of that process. The main theoretical perspective which studied OI is the Social Identity Theory, in this framework, Ashforth and Mael (1989) define OI as a specific form of social identification and the extent to which workers define themselves by the same attributes as those which define the organization. If someone's self-concept has many similar characteristics as the organization, it is more likely that he or she will define the organization as a social group. OI is one form of work identity, it is the extent to which an organization's identity and an employee's own identity overlap (Van Knippenberg and Sleebos 2006). Related to OI, the literature (Bartels 2006) has highlighted positive outcomes of OI on communication satisfaction (CS from here), individual and organizational performance, and well-being. A growing body of evidence suggests that employee motivation and identification with the organization are correlated with effective communication and other resource-building strategies implemented by employees (Bartels 2006). Although there is agreement on the positive function that OI and CS play for employees and organizations, there are several gaps in the current research. For example, OI is mostly treated as a holistic construct, in which employees are assumed to identify with an organization as a whole. Therefore, it is necessary to explore the role of employees' and the organization's personal resources, such as job crafting, which can have a positive impact on outcomes such as CS in relation to OI. Therefore, by OI, we refer, in line with the conceptualizations of some authors, to the way of explaining the relationship between individuals and the organization they work for. OI can be defined as "the perception of uniqueness or of belonging to an organization, in which the individual defines himself in terms of the organization of which he is a member" (Mael and Ashforth 1992). There is agreement in the literature that employees who identify strongly with their organization demonstrate positive attitudes and behaviors towards the organization they work for (Bartels 2006).

It is well known that employee identification with the organization is a contributing factor to organizational success. A widely accepted view is that OI is an alignment between individual and collective identities, resulting in a sense of unity between the person and their organization, and the description of self and collectivity in similar terms (Gutierrez et al. 2010). Individuals strongly identified with their organization will tend to perceive corporate goals as their own, and this will motivate them to work harder to achieve them. It has been highlighted in the literature that a strong sense of belonging strongly correlates with the involvement of workers and with a greater frequency of organizational citizenship behaviors (Mael and Ashforth 2001). According to Mael and Ashforth, OI refers to the perception of unity between the individual and the organization and occurs when the employee defines himself in terms of belonging to the organization (Mael and Ashforth 1992). Scholars have shown that this form of attachment to the organization correlates with several positive organizational outcomes (Kreiner and Ashforth 2004). OI should have a positive impact on the well-being of workers, as being part of a group (e.g., own organization and work group) satisfies important human needs such as the need for security, belonging, and reducing uncertainty (Elstak et al. 2015). Furthermore, strongly identified workers tend to receive and provide more social support and develop collective responses to work problems; in fact, a strong sense of belonging is a crucial factor for the development of collaborative and cooperative behavior among colleagues (Sluss et al. 2008). We could consider organization identification a communicative process; in fact, OI provides employees with the opportunity to create and share their perceptions about the characteristics of the organization (Wiesenfeld et al. 1999; Tuzun 2013).

## 1.2 Communication satisfaction

Communication is one of the most incisive ways of the organization's functioning, as employees spend a lot of time collecting and sharing information regarding various aspects of working life. Very often, however, the availability and appropriateness of job information are beyond the control of employees; otherwise, when communication sources meet employee needs, they are likely to perceive CS (Chan and Lai 2017). CS, in organizational contexts, has been defined as the individual's satisfaction with the various aspects of communication: interpersonal, group, and organizational (Crino and White 1981). CS is a multidimensional construct, made up, according to Down and Hazen, of eight dimensions: communication climate, supervisory communication, organizational integration, media quality, coworker communication, corporate information, personal feedback, and subordinate communication (Downs 1977). The communication climate can be defined as: "a subjectively experienced

quality of the internal environment of an organization; the concept embraces a general cluster of inferred predispositions, identifiable through reports of members' perceptions of messages and message-related events occurring in the organization" (Dennis 1974). Supervisory communication refers to the two-way communication flow between employee and supervisor (e.g., manager feedback and employee perception of trust). Organizational integration is the information employees receive about their immediate work environment (e.g., information on departmental plans, job requirements, and personnel news). With media quality, we refer to the clarity and accuracy of written directives and the quantity and quality of communication in the organization (e.g., company notes and meetings). Coworker communication refers to the wealth of information in informal communication networks in the organization. Company information refers to information about the company as a whole, such as the company's performance, goals, and external events affecting the organization. Personal feedback is the appropriateness of giving employees communication about their performance evaluations and how they are judged in some formalized context. Subordinate communication examines how subordinates respond to communication and how employees initiate upward communication (Chan and Lai 2017). CS can improve employee attitudes toward the organization. Thus, CS can be considered to be associated with employee identification with the organization (Burke 1969). In support of this thesis, research suggests that the frequency with which employees communicate with each other improves organizational engagement because frequent communication leads people to feel like active participants in the organization (Huff et al. 1989).

Organizations today are often thought of as flows of information and information processing capabilities (Tushman and Nadler 1978). CS can be described as the individual's satisfaction with the communication and relational dynamics within the organization (Nakra 2006). Research has found that there are positive relationships between the amount of time spent communicating and some important work outcomes, such as job satisfaction and level of engagement in the organization (Yammarino and Bass 1990). The communication practices in an organization are related to CS but are not synonymous with it (Carriere and Bourque 2009). In line with the assumption that even if an employee has the ability to spontaneously identify with a target as an organization, the identification process is facilitated by communication processes (Cheney 1983; Nakra 2006). CS and OI are hypothesized to influence each other. Therefore, the first hypothesis of this study is aimed at exploring the relationship between OI and CS. This exploration becomes relevant also, and above all, to support smart working workers to face and effectively manage their working lives during times of crisis.

In agreement with the previous literature, the following is hypothesized:

- $H_1$ . OI and CS influence each other positively.
- $H_2$ . OI and JC are positively correlated.
- $H_3$ . JC mediates the relationship between OI and CS.

### 1.3 Job crafting and organizational identification

The literature on identification with the organization suggests that a number of organizational and individual factors can be traced back to individuals' perceived identification with the organization (Van Knippenberg and Van Schie 2000). Recent studies have revealed that employees with higher perceptions of organizational identification establish positive attitudes towards it, feel more motivated to display beneficial organizational behavior, and have the belief that their work efforts are valuable to the organization (Hur et al. 2017; Wang et al. 2017). Similarly and mutually, employees who value their work tend to identify more easily with the organization. In support of this view, research showed that proactive work behaviors that lead to mostly positive outcomes are positively associated with individuals' perceived organizational identification (Klimchak et al. 2016; Bacaksiz et al. 2017; Hur et al. 2017). Considering the perspective of proactive behavior, job crafting (from here on JC), understood as the personal resource of workers, has a positive relationship with organizational identification. JC refers to the practice in which employees voluntarily make changes to their tasks, responsibilities, and working relationships to better suit their skills, interests, and needs. In essence, employees actively engage in shaping their work so that it is more meaningful and rewarding for them (Wrzesniewski and Dutton 2001). When employees engage in JC and modify their work to better align it with their personal skills and desires, they are likely to develop a deeper sense of involvement in their work. This involvement could lead to increased organizational identification, as employees see the organization as an environment that allows them to express themselves and cultivate meaningful work.

However, in the previous literature, a limited number of studies have investigated the relationship between JC and OI (Niessen et al. 2016). In this sense, it is aimed at clarifying the relationship between these concepts.

### 1.4 JC as a mediator between OI and CS

In today's changing organizations that daily demand to manage change and face the new challenges of the post-pandemic production world, a strategic element for the survival and sustainability of work behavior is the ability to develop proactive work behavior; this ability is concretely expressed in the ability to modify one's tasks, identify creative solutions to

current problems, use the support of colleagues to improve one's work behavior, and develop new professional skills. One of the ways in which companies influence the strategies implemented to implement and manage change is through effective communication of these changes, satisfaction with the communication received, and strategy management planning (Armenakis et al. 1993). It is also important to share this planning, leaving room for autonomy in the development of skills to manage these changes. Communication is one of the ways to activate employees and convince them to embrace change. Indeed, employee collaboration is crucial during a change process, as it is through their actual behavior that organizational change occurs (Porrás and Robertson 1992). Today, employers expect employees not only to adapt to implemented changes but also to introduce changes themselves. Therefore, the role of employees in adapting to organizational change becomes critical. For this reason, it is crucial to take into account various ways that workers have to manage change. JC is one of these forms of proactive behavior; it refers to the proactive/self-initiated and change-oriented behavior of works, by aiming to ensure a better fit between the job and the person (Meijerink et al. 2020). JC behaviors allow the employee to reshape social and structural resources, find challenges, and cope with them to improve their context and their performance. As a result, by considering the theoretical framework in which JC is allocated, the job demands and the job resources are related in a dynamic balance that ensures the development of a motivational process, which in turn results in positive individual and collective outcomes. This projection leads, in the long term, to levels of well-being for employees and productivity for the organization. Workers having the opportunity to craft their job tend to cultivate positive organizational outcomes such as a positive sense of meaningfulness and work identity (Wrzesniewski and Dutton 2001; Tims et al. 2016), employee retention (Tims and Bakker 2010), job satisfaction (De Beer et al. 2016; Rudolph et al. 2017), and satisfaction with communication (Petrou et al. 2018). JC, if promoted as a skill to be developed, helps workers to have a better fit with their jobs, show better performance, commit to their jobs, and be satisfied (Kim et al. 2018). Even though JC is not the remedy for all organizational challenges, it is crucial for companies to manage it in such a way that it has advantageous effects on the organizations and the employees (Demerouti 2014). Aiming to explore how OI, considered a success factor for the well-being of a company, impacts one of the positive outcomes of individual well-being, such as satisfaction with communication (from here on SC), we use JC as a mediating variable, as it represents a resource-building strategy implemented by employees that can improve and strengthen the relationship between IO and SC.

## 2 Data collection and instruments

In this section, a description of the questionnaire and the data collected is introduced.

### 2.1 Sample and procedure

*Sample.* A sample of 73 Employees of the Territorial Labor Inspectorate (TLI) of Bari (mean age =  $54.3 \pm 7.75$ ; 54.9% female) was reached by the study. Although the sample is rather limited, it meets the characteristics of the specific research design and the target group, i.e., the employees of the labor inspectorate, a rather small population of employees. Given the small size of the sample used in this research, Partial Least Squares Structural Equation Modeling was used. As will be explained in the specific paragraph, this statistical technique is well suited to this type of case (Guenther et al. 2023; Kono and Sato 2023).

The socio-demographic characteristics of the sample reveal that 5.6% of the participants have a lower secondary school or vocational training diploma, 32.4% have a high school diploma, 40.8% have a university degree, and 21.1% have achieved a postgraduate specialization. The sample is made up of 15.3% of single men/women, 4.2% of people who are in a relationship (unmarried/cohabiting), 75% of married/cohabiting people, and 5.6% of separated/divorced people. More than half of the sample (56.9%) have dependent children, aged between 3 and 37 years (mean age = 22.6 years). 53.6% of children attend/attended school lessons remotely. The sample reveals that 23.9% have disabled dependents, and 12.5% of the participants are frail. More than half of the sample (60.6%) stated that home management is shared. The research participants have different types of contracts, among which 91.7% declare to be permanent workers, 4.2% full-time workers, 2.8% part-time workers, and the remaining 1.4% have another type of contract. Of these, only 2.8% are retired. The majority of the sample holds the roles of labor inspector (34.4%) and administrative assistant (31.1%), while the remainder performs the roles of official (23%) and process/team manager (11.5%). Participants work on various Territorial Labor Inspectorate processes, specifically 61.1% dealing with supervision, 15.3% with legal aspects, 12.5% with user services, 6.9% with planning, control and operation, and 4.2% with regional connection units. Most of the sample reported living between 1 and 5 km from work (41.7%), 29.2% between 10 and 25 km, 18.1% between 25 and 50 km, 6.9% more than 50 km, and 4.2% less than 5 km. In addition, the most used means of getting to work is the car (72.9%) followed by public transport (13.9%), while the rest use other means (4.2%) or reach work on foot (2.8%).

*Procedure.* The tools used to collect the data were reported on and administered via Google Forms, and the participants individually completed the questionnaires. The study was

introduced by a member of the research team, highlighting the voluntary nature of participation and the anonymity of the responses. In fact, the participants were also informed that only the research group would have access to the data, analyzing them collectively. Participation in this study took place after completing written informed consent by part of the subjects. Participants took an average of 30 min to respond. A space has also been dedicated to any doubts and needs for clarification concerning the research. All procedures performed in the study followed the ethical standards of the Institutional Research Committee and the 1964 Declaration of Helsinki and its subsequent amendments or comparable ethical standards. The project was approved by the Ethics Commission for Research in Psychology of the Department of Human and Social Sciences of the University of Salento (March 25, 2021; protocol n. 0056300).

## 2.2 Instruments

Data were collected using a self-report questionnaire containing the following measures:

- Job Crafting Scale (JC): The short-form Job Crafting Scale (Cenciotti et al. 2016) was used to measure the JC variable. This version is the adapted version of the original one (Tims et al. 2012) to allow more flexible and shorter use. This short scale was validated in the Italian version by Ingusci and colleagues in 2018. According to the authors, the short form is significant in reducing the burden on the participants. Thus, it offers a brief assessment of a proactive strategy that might be central to increasing well-being at work. Also, its brevity and its comprehensive content allow for the design of surveys that include other important organizational variables and relate to each other to better understand their impact on well-being at work from a sustainable perspective (Cenciotti et al. 2016; Ingusci 2018; Ingusci et al. 2018). The structure adopted in this contribution is three-factor, composed of 8 items. The three factors are represented by: Challenging Demands (CHA), Structural Resources (STR), and Increasing Social Resources (SOC). CHA and STR factors are made up of three items, while SOC is mono-item. Examples of items for each factor are: “I try to develop my capabilities” (STR), “I ask my supervisor to coach me” (SOC), and “When an interesting project comes along, I offer myself proactively as project coworker” (CHA). Responses to items are measured by a 5-point frequency scale, ranging from 1 = never to 5 = always.
- Organizational Identification Scale (OI): As regards the variable “OI”, the Italian translation of the six-item scale by Mael and Ashforth (Mael and Ashforth 1992) was used (Spagnoli 2016). In this study, each item has a 5-

point response scale, where 1 = completely disagree and 5 = completely agree. Examples of items are: “When I speak of the organization I work for, I usually say we rather than they”; “When someone praises the organization I work for, it is as if he was paying me a personal compliment”.

- Communication Satisfaction (CS): ad-hoc items were used to measure how satisfactory communication at work was during the period of the teleworking/smart working experience. CS consists of four items rated on a 5-point Likert scale (ranging from 1 = not at all to 5 = to all and N/A = “not applicable”). A Principal Component Analysis will be performed in a way to ascertain the uniqueness of the scale through a Varimax rotation, and the results will be reported in the related section.
- Socio-demographics were asked of participants, indicating their ethnic background, age, gender, education level, profession, and relationship status.

## 3 Methods of data analysis

In the following sections, the different analysis techniques used in this study will be presented, which can be divided into four phases:

1. Principal Component Analysis (PCA) is introduced for the uni-dimensionality evaluation of the LVs,
2. Confirmatory Composite Analysis based on Partial Least Squares (CCA-PLS) is the approach to evaluate the quality of the first- and second-order LVs.
3. A higher order PLS-SEM model is formalized to analyze the mediation effect.
4. In the end, the results will be extended and enriched with the performance–importance analysis (IPMA).

### 3.1 Principal component analysis (PCA)

To determine the number of dimensions underlying each scale used in the questionnaire (JC, OI, and CS), the data collected through it were subjected to PCA. It is a multivariate statistical technique that reduces the initial data of observed variables on the same individuals into a smaller set of variables called principal components (PCs). The rotation used was Varimax, and the analysis was performed on Jamovi software. Varimax is the most widely used factor rotation algorithm for the PCA method, in which the axes are rotated while maintaining their orthogonality (i.e., they are independent). Orthogonal rotation modifies the positioning of the axes to pass the axes as much as possible within homogeneous groups of variables (Kaiser 1958; Jolliffe and Cadima 2016; Greenacre et al. 2022).

### 3.2 Confirmatory composite analysis with partial least squares (CCA-PLS)

To confirm the first- and second-order factorial structures, a Confirmatory Composite Analysis based on Partial Least Squares estimator (CCA-PLS) has been performed. CCA-PLS is a systematic method for confirming the measurement model in the Partial Least Squares framework for the SEM (Ciavolino et al. 2022b; Ferrante et al. 2022; Sarstedt et al. 2019; Hair et al. 2020; Schubert et al. 2018; Ingusci et al. 2023a). It is also a series of steps that can be executed with composite-based SEM methods such as PLS-SEM or Generalized Structured Component Analysis (GSCA) to confirm both reflective and formative measurement models within a specific nomological network. The statistical objective of CCA-PLS is the confirmation of a measurement theory and begins with proposing theoretical constructs to be confirmed (Hair et al. 2020; Ciavolino et al. 2022b; Sarstedt et al. 2019).

The JC model is assessed by considering two stages:

- *Stage 1: Lower order constructs (LOC) measurement model assessment:* (1) Evaluation of the loading indicators (between 0.40 and 0.70; Hulland 1999) and significance via bootstrap procedure (Hair et al. 2012); (2) Evaluation of the squared loading, which refers to the explained variance of the indicators, to test the explained variance; (3) Internal consistency via (Cronbach's  $\alpha$  and Composite Reliability—CR > 0.700); (4) Convergent Validity (Average Variance Extracted—AVE > 0.500) and discriminant validity (heterotrait-monotrait ratio of the correlations—HTMT < 0.85).
- *Stage 2: Higher order constructs (HOC) measurement model assessment:* (1) Internal consistency considering Cronbach's Alpha based on the correlation between the LOCs and the Composite Reliability based on the path coefficients between LOCs and HOC; (2) Average Variance Extracted, for the convergent validity, computed taking into account the squared path coefficients between HOC and LOCs; (3) Discriminant validity is performed by considering the HTMT approach; (4) Assessing via bootstrapping procedure the LOCs loadings and significance.

*Assessment of structural model:* The model is formalized in the next section, but here it is discussed the assessment of the internal model as the nomological path that connects all the LVs. The higher order mediation model analysis evaluation involves examining the model's predictive capabilities and the relationships between the constructs. They were carried out through a non-parametric procedure, namely bootstrapping (5000 samples) (Hair et al. 2016; Ramayah et al. 2023; Ingusci et al. 2023b). The key criteria for assessing the structural model in PLS-SEM is the evaluation of the

path coefficients' significance, representing the hypothesized relationships among the constructs, and they are statistically significant if confidence intervals for the estimated path coefficients do not include zero. Other main evaluation criteria for the assessment of structural model results are the coefficients of determination ( $R^2$ ) as well as the significance of the path coefficients, the  $f^2$  effect sizes, and predictive relevance ( $Q^2$ ).

### 3.3 Higher order mediation model with PLS-SEM

The higher order PLS-SEM is formalized by the theoretical path model reported in Fig. 1. The “Job Crafting Mediation Model” considers the direct effect between the first-order LVs  $\xi_{OI}^I$  and  $\xi_{CS}^I$  and the mediated effect of higher order LV  $\xi_{JC}^{II}$  on the relationship between  $\xi_{OI}^I$  and  $\xi_{CS}^I$  (Fig. 1). All variables were specified reflectively, in particular  $\xi_{OI}^I$  and  $\xi_{CS}^I$  as first-order ones and  $\xi_{JC}^{II}$  as second-order one. All the latent variables were measured reflectively by their own indicators, in other words:

- $\xi_{OI}^I$  represents the *Organizational Identification* first-order exogenous variable, measured by its five indicators;
- $\xi_{CS}^I$  represents the *Communication Satisfaction* first-order endogenous variable, measured by its four indicators;
- $\xi_{JC}^{II}$  represents the *Job Crafting* higher order mediation latent variable, measured by three first-order LVs, namely  $\xi_{STR}^I$  (*Structural Resources*),  $\xi_{SOC}^I$  (*Social Resources*), and  $\xi_{CHA}^I$  (*Challenging Resources*).

Research hypotheses were estimated via a variance-based estimator, Partial Least Square Modeling (Wold 1975; Ciavolino and Nitti 2013b, a; Nitti and Ciavolino 2014; Hair et al. 2016; Ciavolino et al. 2022a). The choice of the PLS estimator is motivated by various factors, detailed below. First of all, PLS-SEM is a technique suitable for considering multiple variables and evaluating the theoretical relationships between them, even in the field of social sciences: in this field it was initially proposed by Wold (1982) and Chin (1998), but it has become popular especially in the last decade (Hair et al. 2019, 2021; Ciavolino et al. 2022b; Ferrante et al. 2022). As the name “partial least squares” suggests, the algorithm iteratively optimizes two “partial” models, namely, the measurement and the structural models, repeating these steps until a given convergence level is achieved and the estimated parameters are stable. Furthermore, PLS-SEM is able to obtain solutions using small or non-probabilistic samples, such as the one used in this study (Usakli and Rasoolimanesh 2023). PLS appears to be the most suitable method for theory development, maximizing the explained variance of the endogenous constructs in the model. In particular, for the measurement, it uses the total

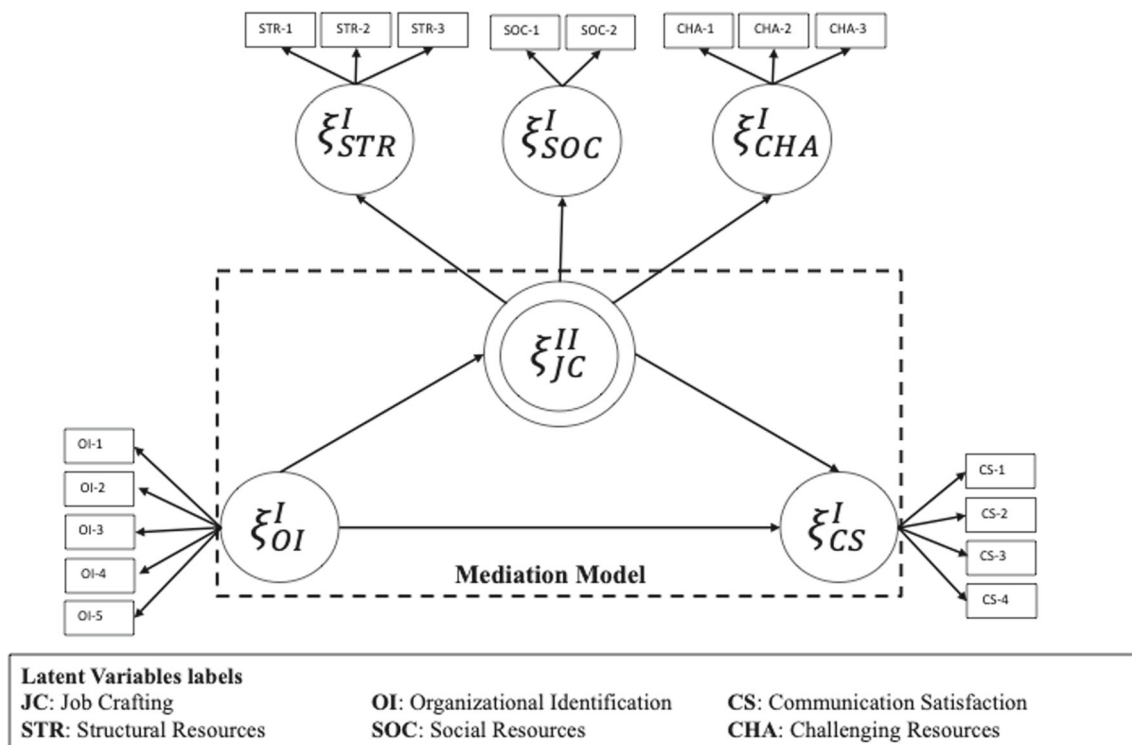


Fig. 1 Job crafting theoretical mediation model

variance of the indicators and adopts a predictive modeling perspective suitable for “predicting key target constructs or identifying key driver constructs” (Rigdon et al. 2017; Hair et al. 2017a). Another motivation in support of the use of the PLS algorithm lies in the type of relationships present in the hypothesized model; in fact, it is indicated for both reflective and formative constructs (in this case, only the former are present) (Hair et al. 2019). PLS-SEM, contrary to CB-SEM, is characterized by its statistical power and its appropriateness if the model is characterized by a certain level of complexity (Hair et al. 2017a, 2013). Specifically, the theoretical model set out above would coincide with a partial mediation one (Hair et al. 2017b; Nitzl et al. 2016).

### 3.4 Importance–performance map analysis (IPMA)

In order to extend the standard PLS-SEM analysis, which provides information on the relative importance of constructs in explaining other constructs in the structural model, the Importance–Performance Map Analysis (IPMA) was conducted (Ringle and Sarstedt 2016; Hair et al. 2017b). Through this analysis, it is possible to explore two dimensions of each construct, namely its importance and performance, thus extending the results of PLS-SEM. The constructs’ importance is represented by the total effects on the target variable, while their performance is represented by their rescaled latent

variable scores. Rescaling is important to facilitate the comparison of latent variables measured on different scale levels so that they can take on values between 0 and 100 (Hock et al. 2010; Kristensen et al. 2000), as shown in the following equation:

$$\xi_i^{\text{rescaled}} = \frac{E[\xi_i] - \min[\xi_i]}{\max[\xi_i] - \min[\xi_i]} \cdot 100 \quad (1)$$

where  $\xi_i$  represents the exogenous variable in the inner model and  $E[\cdot]$ ,  $\min[\cdot]$ , and  $\max[\cdot]$  represent the expected value, minimum, and maximum, respectively.

The average importance and performance of the LVs are drawn in a two-dimensional matrix and divided into four quadrants, which are observed in the following order:

- in the upper right quadrant, place the constructs with both medium-to-high performance and importance;
- in the upper left quadrant, place the constructs with medium-to-high performance and medium-to-low importance;
- in the lower left quadrant, place the constructs with both medium-to-low performance and importance;
- in the lower right quadrant, place the constructs with medium-to-low performance and medium-to-high importance.

**Table 1** OI's scale PCA results

	Component	
	1	Uniqueness
OI1	0.750	0.438
OI2	0.795	0.368
OI3	0.817	0.332
OI4	0.831	0.309
OI5	0.810	0.343

'Varimax' rotation was used

**Table 2** CS's scale PCA results

	Component	
	1	Uniqueness
CS1	0.919	0.155
CS2	0.888	0.212
CS3	0.903	0.184
CS4	0.833	0.306

'Varimax' rotation was used

This analysis aims to identify the constructs that reveal low performance but have a significant weight within the model.

## 4 Results

Following are the results related to each analysis performed, that is PCA, CCA-PLS, higher order PLS-SEM, and IPMA.

### 4.1 PCA results

The PCA was performed on each scale to explore the relative components, which is useful for the variables' definition within the mediation model. Below are the results:

- OI reveals a single dimension on which OI1, OI2, OI3, OI4, and OI5 saturate, as reflected by the first two eigenvalues equal to 3.208 and 0.610 (Table 1);
- CS has a single dimension on which CS1, CS2, CS3, and CS4 saturate, as demonstrated by its first two eigenvalues equal to 3.142 and 0.418 (Table 2);
- JC reveals a three-factor solution, as the first, second, and third eigenvalues show (4.675, 1.471, and 0.795, respectively). SOC1 and SOC2 saturate on the 1st one; CHAL1, CHAL2, and CHAL3 saturate on the 2nd one; and STR1, STR2, and STR3 saturate on the 3rd one (Table 3).

Ultimately, this analysis highlights the presence of factors  $\xi_{OI}^I$  for organizational identification and  $\xi_{CS}^I$  for communication satisfaction. Furthermore, we find  $\xi_{SOC}^I$  for the social

**Table 3** JC's scale PCA results

	Component			
	1	2	3	Uniqueness
SOC1			0.889	0.0959
SOC2			0.874	0.1013
STR1	0.919			0.0531
STR2	0.939			0.0537
STR3	0.944			0.0596
CHA1		0.727		0.1769
CHA2		0.870		0.1104
CHA3		0.805		0.2782

'Varimax' rotation was used

**Table 4** Measurement model evaluation results: Cronbach's  $\alpha$ , CR ( $\rho_c$ ), CR ( $\rho_a$ ), and AVE

	Cronbach's $\alpha$	CR ( $\rho_c$ )	CR ( $\rho_a$ )	AVE
$\xi_{CHA}^I$	0.855	0.913	0.892	0.782
$\xi_{CS}^I$	0.897	0.928	0.912	0.766
$\xi_{OI}^I$	0.856	0.894	0.892	0.634
$\xi_{SOC}^I$	0.892	0.949	0.895	0.903
$\xi_{STR}^I$	0.969	0.980	0.971	0.942
$\xi_{JC}^{II}$	0.897	0.919	0.908	0.594

resources,  $\xi_{CHA}^I$  for the challenging resources, and  $\xi_{STR}^I$  for the structural resources, which are the factors underlying  $\xi_{JC}^I$ .

### 4.2 Assessment of the measurement model with CCA-PLS

All latent variables (LVs) were specified reflectively. Cronbach's  $\alpha$  values (0.855, 0.897, 0.856, 0.892, 0.969, and 0.897) and Composite Reliability  $\rho_c$  values (0.913, 0.928, 0.894, 0.949, 0.980, and 0.919) of each measurement scale reveal excellent internal consistency, as they respectively exceed the threshold values of 0.700 for both the indexes (Table 4). The values of the AVE, being higher than the threshold of 0.500 for all the variables (respectively, 0.782, 0.766, 0.634, 0.903, 0.942, and 0.594), are more than acceptable and ensure good convergent validity (Table 4).

HTMT results (Table 5) show that all LVs have a value below the conservative threshold of 0.85 and their confidence intervals do not contain the value 1, suggesting that the constructs are empirically distinct.

All the standardized outer loadings (Table 6) of the LVs are above the threshold values of (0.400–0.708) and ranged between 0.617 and 0.975 with significant bootstrap intervals, which suggests a good level of indicator reliability (Hulland 1999).



**Table 5** Measurement Model Evaluation results: HTMT

	Original sample	Sample mean	Confidence intervals
$\xi_{CS}^I \leftrightarrow \xi_{CHA}^I$	0.464	0.467	[0.221; 0.678]
$\xi_{JC}^{II} \leftrightarrow \xi_{CS}^I$	0.593	0.593	[0.398; 0.760]
$\xi_{OI}^I \leftrightarrow \xi_{CHA}^I$	0.483	0.497	[0.273; 0.712]
$\xi_{OI}^I \leftrightarrow \xi_{CS}^I$	0.618	0.616	[0.421; 0.783]
$\xi_{OI}^I \leftrightarrow \xi_{JC}^{II}$	0.614	0.617	[0.369; 0.814]
$\xi_{SOC}^I \leftrightarrow \xi_{CHA}^I$	0.675	0.676	[0.416; 0.901]
$\xi_{SOC}^I \leftrightarrow \xi_{CS}^I$	0.322	0.330	[0.125; 0.565]
$\xi_{SOC}^I \leftrightarrow \xi_{OI}^I$	0.458	0.457	[0.222; 0.675]
$\xi_{STR}^I \leftrightarrow \xi_{CHA}^I$	0.566	0.563	[0.334; 0.755]
$\xi_{STR}^I \leftrightarrow \xi_{CS}^I$	0.607	0.599	[0.384; 0.756]
$\xi_{STR}^I \leftrightarrow \xi_{OI}^I$	0.546	0.540	[0.250; 0.775]
$\xi_{STR}^I \leftrightarrow \xi_{SOC}^I$	0.453	0.450	[0.217; 0.651]

**Table 6** Measurement model evaluation results: indicators loadings and confidence intervals

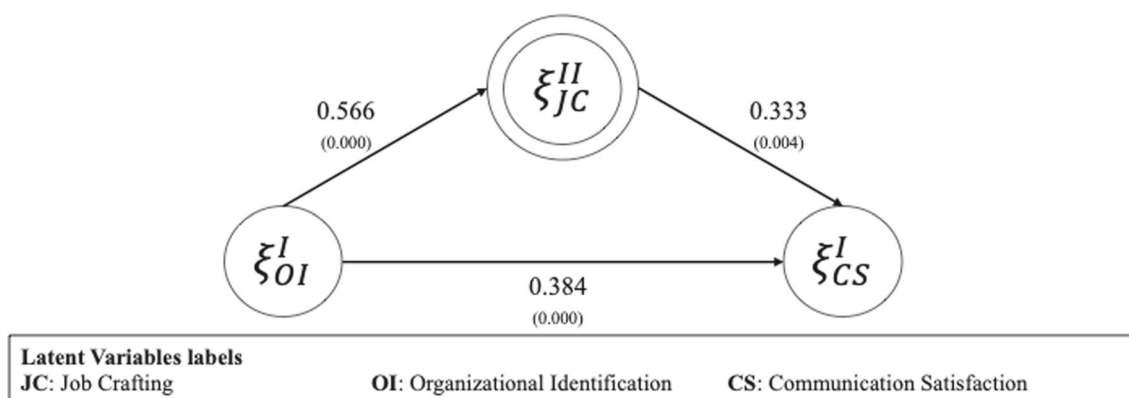
	Original sample	Sample mean	Confidence interval
$\xi_{CHA}^I \rightarrow CHA1$	0.918	0.921	[0.886; 0.950]
$\xi_{CHA}^I \rightarrow CHA2$	0.948	0.948	[0.919; 0.969]
$\xi_{CHA}^I \rightarrow CHA3$	0.777	0.767	[0.533; 0.897]
$\xi_{CS}^I \rightarrow CS1$	0.904	0.900	[0.821; 0.951]
$\xi_{CS}^I \rightarrow CS2$	0.862	0.862	[0.773; 0.927]
$\xi_{CS}^I \rightarrow CS3$	0.885	0.881	[0.738; 0.957]
$\xi_{CS}^I \rightarrow CS4$	0.851	0.852	[0.774; 0.910]
$\xi_{OI}^I \rightarrow OI1$	0.723	0.717	[0.561; 0.823]
$\xi_{OI}^I \rightarrow OI2$	0.814	0.816	[0.705; 0.894]
$\xi_{OI}^I \rightarrow OI3$	0.854	0.858	[0.783; 0.916]
$\xi_{OI}^I \rightarrow OI4$	0.817	0.806	[0.617; 0.914]
$\xi_{OI}^I \rightarrow OI5$	0.780	0.768	[0.595; 0.879]
$\xi_{SOC}^I \rightarrow SOC1$	0.951	0.951	[0.921; 0.970]
$\xi_{SOC}^I \rightarrow SOC2$	0.950	0.949	[0.925; 0.968]
$\xi_{STR}^I \rightarrow STR1$	0.975	0.974	[0.952; 0.988]
$\xi_{STR}^I \rightarrow STR2$	0.973	0.972	[0.950; 0.988]
$\xi_{STR}^I \rightarrow STR3$	0.966	0.965	[0.936; 0.983]

**Table 7** Structural model evaluation results: total effects with confidence intervals

Relationship	Original sample	Sample mean	SD	Confidence interval	T statistics	P values
$\xi_{JC}^I \rightarrow \xi_{CHA}^I$	0.854	0.855	0.044	[0.750; 0.921]	19.209	0.000
$\xi_{JC}^I \rightarrow \xi_{CS}^I$	0.333	0.320	0.115	[0.087; 0.533]	2.903	0.004
$\xi_{JC}^I \rightarrow \xi_{SOC}^I$	0.748	0.747	0.066	[0.600; 0.854]	11.301	0.000
$\xi_{JC}^I \rightarrow \xi_{STR}^I$	0.848	0.846	0.046	[0.737; 0.914]	18.416	0.000
$\xi_{OI}^I \rightarrow \xi_{CHA}^I$	0.483	0.489	0.097	[0.286; 0.661]	4.992	0.000
$\xi_{OI}^I \rightarrow \xi_{CS}^I$	0.572	0.582	0.077	[0.417; 0.720]	7.413	0.000
$\xi_{OI}^I \rightarrow \xi_{JC}^I$	0.566	0.571	0.106	[0.339; 0.749]	5.345	0.000
$\xi_{OI}^I \rightarrow \xi_{SOC}^I$	0.423	0.427	0.092	[0.238; 0.595]	4.606	0.000
$\xi_{OI}^I \rightarrow \xi_{STR}^I$	0.480	0.484	0.100	[0.269; 0.660]	4.811	0.000

**Table 8** Structural model evaluation results with HOC: indirect effects with confidence intervals

	Original sample	Sample mean	SD	Confidence interval	T statistics	P values
$\xi_{OI}^I \rightarrow \xi_{CHA}^I$	0.483	0.489	0.097	[0.286; 0.045]	4.992	0.000
$\xi_{OI}^I \rightarrow \xi_{CS}^I$	0.188	0.183	0.077	[0.045; 0.238]	2.432	0.015
$\xi_{OI}^I \rightarrow \xi_{SOC}^I$	0.423	0.427	0.092	[0.238; 0.269]	4.606	0.000
$\xi_{OI}^I \rightarrow \xi_{STR}^I$	0.480	0.484	0.100	[0.269; 0.000]	4.811	0.000
$\xi_{OI}^I \rightarrow \xi_{JC}^I \rightarrow \xi_{SOC}^I$	0.423	0.427	0.092	[0.238; 0.595]	4.606	0.000
$\xi_{OI}^I \rightarrow \xi_{JC}^I \rightarrow \xi_{CS}^I$	0.188	0.183	0.077	[0.045; 0.346]	2.432	0.015
$\xi_{OI}^I \rightarrow \xi_{JC}^I \rightarrow \xi_{STR}^I$	0.480	0.484	0.100	[0.269; 0.660]	4.811	0.000
$\xi_{OI}^I \rightarrow \xi_{JC}^I \rightarrow \xi_{CHA}^I$	0.483	0.489	0.097	[0.286; 0.661]	4.992	0.000

**Fig. 2** Job crafting model path diagram

### 4.3 Higher order PLS-SEM results

After the confirmation that the lower order construct measures are reliable and valid, the next step addresses the assessment of the structural model results. As specified above, the structure of the “Job Crafting model” mirrors that of a partial moderation model. More specifically,  $\xi_{OI}^I$  and  $\xi_{CS}^I$  constructs are linked by a direct effect equal to 0.384. In addition, there is an indirect effect between the two constructs via the mediating  $\xi_{JC}^{II}$  construct. This indirect effect, which is equal to 0.188, can be calculated as the product of the two effects ( $0.566 \cdot 0.333$ ). The total effect is equal to  $0.572 = 0.384 + 0.188$ . We provide details on the indirect effects and the total effects in Tables 7 and 8, respectively. This type of result suggests that the direct relationship from the OI construct to the CS one is partially mediated by the JC construct. The path diagram can be seen in Fig. 2.

Moreover, we considered the coefficient of determination ( $R^2$ ), effect size ( $f^2$ ), and predictive relevance ( $Q^2$ ) to further evaluate the structural model (Table 9).  $R^2$  values are equal to (0.733, 0.421, 0.562, 0.717, and 0.337). The variance explained for both constructs exceeds the minimum value of 10% (Falk and Miller 1992). The effect size  $f^2$

**Table 9** Structural model evaluation results:  $R^2$ , Adj.  $R^2$ , and  $Q^2$ 

	$R^2$	Adj. $R^2$	$Q^2$
$\xi_{CHA}^I$	0.733	0.729	0.165
$\xi_{CS}^I$	0.421	0.404	0.293
$\xi_{SOC}^I$	0.562	0.556	0.149
$\xi_{STR}^I$	0.717	0.713	0.247
$\xi_{JC}^I$	0.337	0.328	0.290

ranges from medium ( $f^2 = 0.168$  for the relationship  $\xi_{OI}^I \rightarrow \xi_{CS}^I$  and  $f^2 = 0.126$  for the relationship  $\xi_{JC}^{II} \rightarrow \xi_{CS}^I$ ) to large ( $f^2 = 0.471$  for the relationship  $\xi_{OI}^I \rightarrow \xi_{JC}^{II}$ ) (Cohen 1988). Finally,  $Q^2$  values, which refer to the predictive power of the model, are all above 0 for all the variables included in the model, attesting to the satisfactory relevance of the relationships (Sarstedt et al. 2021).

In Table 10, the IPMA results reveal the performance and the importance of  $\xi_{JC}^{II}$  and  $\xi_{OI}^I$  LVs, excluding the CS LV as it has been indicated as a target construct. The constructs’ performance values are both high (respectively, 64.362 for  $\xi_{JC}^{II}$  and 63.776 for  $\xi_{OI}^I$ ), while the importance values reveal that  $\xi_{OI}^I$  (0.572) is more important than  $\xi_{JC}^{II}$  (0.333). In fact,

**Table 10** IPMA latent variables results with HOC

	LV importance	LV performance
$\xi_{CHA}^I$		58.488
$\xi_{JC}^I$	0.333	64.362
$\xi_{OI}^I$	0.572	63.776
$\xi_{SOC}^I$		49.643
$\xi_{STR}^I$		75.821

the  $\xi_{JC}^{II}$  is located in the second quadrant and the OI in the first one (Fig. 4).

It is worth noting the behavior of the performance of the first-order constructs that compose  $\xi_{JC}^{II}$  ( $\xi_{STR}^I$ ,  $\xi_{SOC}^I$ ,  $\xi_{CHA}^I$ ): while  $\xi_{STR}^I$  and  $\xi_{SOC}^I$  are associated with good performance but lower than  $\xi_{OI}^I$  and the corresponding higher order construct  $\xi_{JC}^{II}$  (with values 58.488 and 49.643, respectively),  $\xi_{STR}^I$  provide the highest performance index (75.821) among the constructs in the model.

#### 4.4 IPMA results and interpretation of variables mean scores

Table 11 reveals the IPMA results about the performance and importance of all the items, excluding the CS MV, as they have been indicated as target items. In particular:

- IO2/3/4/5 have medium-to-high performance and importance;
- STR1/2/3, CHA1/2, and SOC1 have medium-to-high performance and medium-to-low importance;
- SOC2 has medium performance and low importance;
- IO1 has both medium performance and importance.

In fact, the first group of items is located in the first quadrant, the second group in the second one, SOC2 in the third one, and IO1 in the fourth one (Fig. 3).

$\xi_{OI}^I$ , with a rescaled average score of 63.776, reveals an adequate identification with one's organization, which on the one hand confers self-gratification and self-esteem (e.g., "The success of my organization is also my success"), and on the other ensures greater cohesion and positive relationships between members (e.g., "When I talk about my organization, I usually use the term 'WE' rather than 'THEY'"). While, for the  $\xi_{JC}^{II}$  variable, the rescaled average score of 64.362 indicates a good tendency to adapt between one's needs and work through personal strategies (e.g., "When there is not much to do, for me, it is a good opportunity to get involved in new projects") and interpersonal strategies (e.g., "Asking for feedback from colleagues or superiors").

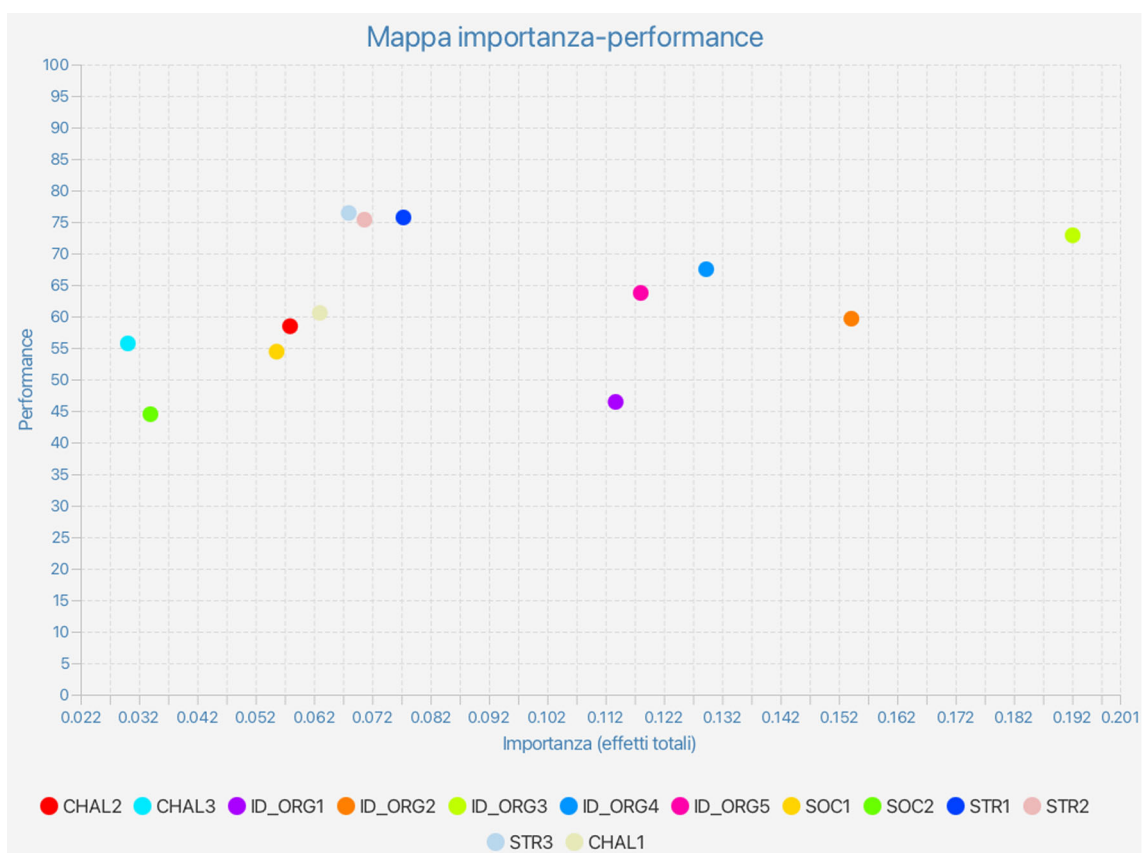
**Table 11** IPMA manifest variables results with HOC

	MV importance	MV performance
CHA1	0.059	60.564
CHA2	0.055	58.451
CHA3	0.041	55.715
IO1	0.114	46.428
IO2	0.156	59.643
IO3	0.192	72.887
IO4	0.130	67.500
IO5	0.118	63.732
SOC1	0.053	54.411
SOC2	0.048	44.485
STR1	0.060	75.715
STR2	0.057	75.362
STR3	0.055	76.428

## 5 Discussion

The study aimed to explore the impact of OI on JC and CS in a Public Administration sample. OI and JC positively affect CS; furthermore, JC positively mediates the relationship between OI and CS. Based on the results, the findings are reviewed and discussed accordingly. The hypotheses formulated led us to think of a first relationship between OI and CS, a second relationship between OI and JC, and a third relationship in which the JC mediates between the first two.

The analysis of the results has, therefore, revealed a model of mediation in which JC mediates the relationship between OI and CS. In this model, it is possible to observe the direct relationships between JC and OI, JC and CS, and the latter with OI. In this case, JC acts as a partial mediator between the other two. We talk about partial mediation because the variable JC improves the relationship between OI and CS, which by itself acts in any case, as confirmed by the previous literature (Wiesenfeld et al. 1999). In this sense, a good OI, which consists of self-esteem and gratification as well as factors ensuring greater cohesion and positive relationships, implements a high level of CS at all organizational levels. At the same time, this relationship is further enhanced by the intervention of the JC, which implements not only an improvement on a personal level but also on an interpersonal level in the organization. Furthermore, considering the CS as an outcome variable and evaluating the intersection between the performance and the importance of the remaining constructs (OI and JC) from the IPMA, as previously clarified, it results that an adequate identification with one's organization is useful for obtaining good organizational communication, thanks to the presence of the drive for personal and interpersonal improvement in the workplace. Specifically, the latent variable OI appears to have a good level of both performance



**Fig. 3** Item performance–importance map analysis

and importance, while the JC appears to have good performance and lower importance.

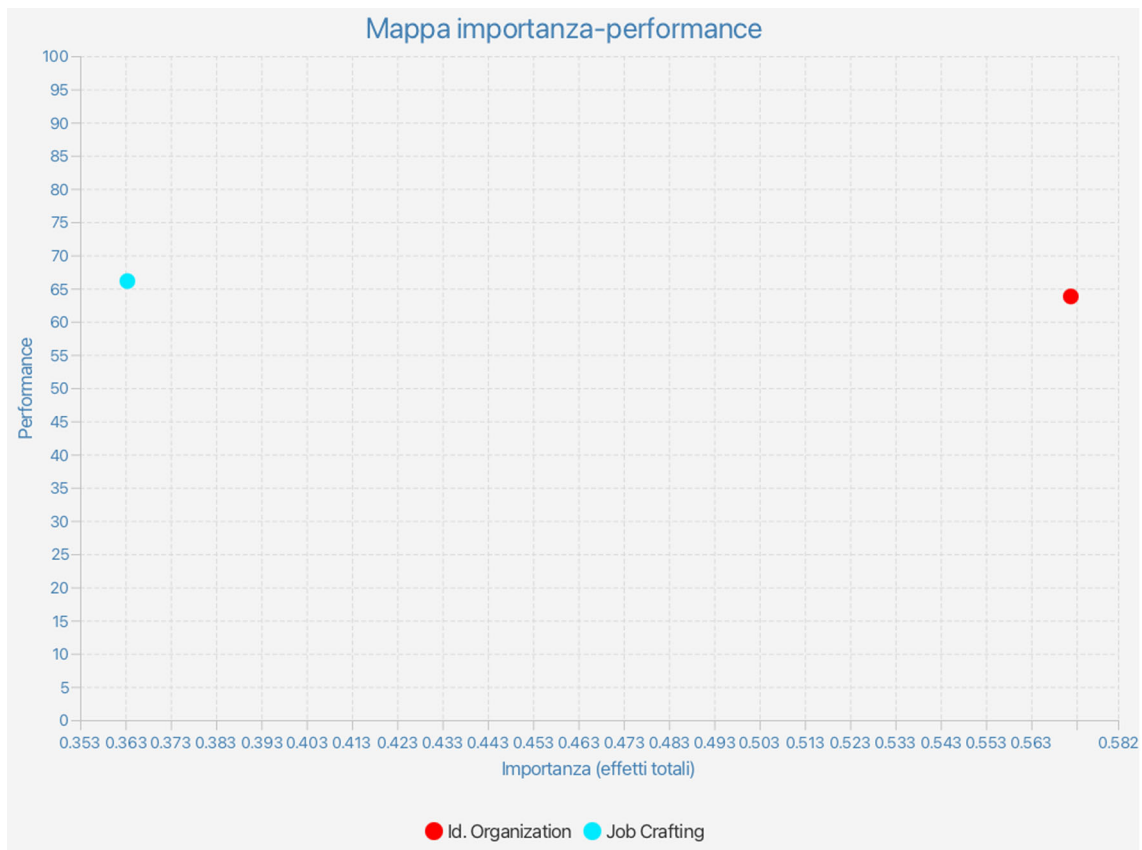
This could be understood in light of the partial mediation relationship between the variables. In this sense, the role of OI appears to be more important than the results of the study. Therefore, we could deduce that communicative satisfaction is more influenced by OI than by JC strategies. Specifically, the items with greater importance in the IPMA analysis concern all the statements belonging to the OI variable. In particular, the item “The success of my organization is also my success” is of great relevance. While the items belonging to the JC scale, such as the latter, proved to be highly performing and less important, except for the item “I ask colleagues in the work groups to which I belong if they are satisfied with the work done”, which also has a low performance. We could conclude by saying, that in agreement with what emerged from the previous literature, OI, understood as a communicative process of sharing the meanings and characteristics of one’s organization (Tuzun 2013), increases CS towards other members and customers.

## 6 Limitations

This investigation has several limitations that may offer insights for future research. First, the analysis was based on cross-sectional data. The sample is heterogeneous in terms of socio-demographic characteristics but inherent in a specific category of employees of the Italian public administration. Furthermore, the sample could be small, and for this reason, the future survey could be aimed at a larger sample and referred to different professional categories. The limited magnitude of the effect size could be another limitation to consider. A plausible justification may relate to the specific characteristics of the sample. The study was based on self-reported measures, which might raise questions of common-method bias.

## 7 Conclusions and practical implications

Today’s scenario imposes major and irrevocable changes in all areas of life, including work and organizational contexts. There is, therefore, a need to implement useful resources in the individual to cope with daily work challenges, such as JC behaviors. Our exploratory study, conducted in the



**Fig. 4** Construct performance–importance map analysis

midst of these changes, has some implications for practitioners. First, the research is part of a line of studies aimed at increasing knowledge on individual, collective, and organizational processes that can enhance job outcomes in terms of well-being, performance, and productivity. Second, it provides practical suggestions to leaders and decision-makers to implement organizational well-being interventions at multiple levels, starting precisely with the enhancement of workers' resources such as OI and JC, in order to positively influence the outcome of CS. To increase employees' OI, leaders can explain to employees what the organization is trying to accomplish and why. If employees buy into the goals of the organization and adopt them as their personal goals, they may use this cognitive perception to legitimize their own JC behaviors (Wrzesniewski and Dutton 2001). In addition, according to research by Brewer and Chen (2007), leaders can foster an increase in JC behavior by implementing employees' OI and CS. Highly identified employees perform their tasks in a way that achieves corporate goals and are willing to subordinate their individual interests to collective interests (Brewer and Chen 2007). The scientific impact of this research will represent an advance in current knowledge. It is now known that interventions to enhance personal resources will not only have repercussions exclu-

sively on individual results but will also have an impact on team functioning, on leaders, and on the organization as a whole. Consequently, this project could also represent a first step towards the implementation of HRM practices aimed at promoting the identification and organizational satisfaction of workers, bearing in mind that this would have positive long-term effects on the organization. Effectively, similar studies developed based on the same reference methodological model, i.e., the JDR, have amply demonstrated the impact of the positive effects of resources such as job crafting on outcomes such as acceptance of organizational change (Bakker and Demerouti 2017; Petrou et al. 2018). The concept of job crafting, understood as the development of employee resources, positively influences the sustainability of the organization. Companies that implement this practice become more attractive to employees, customers, and investors. In other words, by promoting beneficial job crafting and avoiding dysfunctional behavior, organizations make their employees more responsive and adaptive to change. This has an impact on multiple levels, as it promotes sustainable innovation processes within organizations.

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**Data availability** The dataset analyzed during the current study are not publicly available due to the confidential nature of the collected data.

## Declarations

**Conflict of interest** On behalf of all the authors, the corresponding author states that there is no conflict of interest.

**Ethical approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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