Journal of Management & Organization, 24:6 (2018), pp. 776–792
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doi:10.1017/jmo.2016.66

Development and validation of an instrument for assessing collective psychological ownership in organizational field settings

JON L PIERCE,* IIRO JUSSILA** AND DAHUI LI§

Abstract

Recently, there emerged a theory of collective psychological ownership – an intersubjective sense of possession for different objects within the work and organizational context (e.g., work space). This shared mind-set has been cast as having the potential to explain a variety of collective, work-related attitudes, and actions. Preventing scientific inquiry into this phenomenon is the absence of an instrument for the measurement of this construct. The purpose of this work was the development and validation of such an instrument. To this end, work with a panel of judges and three sequentially conducted field studies was undertaken. Construct validation evidence (e.g., content, discriminant, nomological, and incremental validity) for an instrument for the assessment of collective psychological ownership is provided.

Keywords: collective psychological ownership, collective cognition, scale development, construct validation, teamwork

Received 19 April 2016. Accepted 6 November 2016

Over the past few decades there has been an appreciable increase in the number of organizations that have initiated and/or expanded their use of work teams (cf. Lim & Ployhart, 2004; Mathieu, Tannenbaum, Kukenberger, Donsbach, and Alliger, 2015). This trend gives rise to the need for rethinking some of the processes (i.e., the hows and whys) associated with the production of job design effects (e.g., Hackman & Oldham, 1975), as well as the conceptualization of phenomena that operate on the collective as opposed to the individual level (Morgeson & Hofmann, 1999). One such effort finds its genesis in the work of Pierce and Jussila (2010). They suggested that one major path through which teamwork and teamwork design produces its work-related effects is through the emergence of a collective sense ownership for the tasks that teams are called upon to perform.

This collective psychology of possession has been noted in anthropological and sociological studies of urban graffiti, neighborhoods, street gangs, and territorial behavior (e.g., Thrasher, 1927; Yablonsky, 1962; Ley & Cybriwsky, 1974; Altman, 1975; Brown, Lawrence, & Robinson, 2005). In addition and

* Department of Management Studies, Labovitz School of Business and Economics, University of Minnesota Duluth, Duluth, MN, USA

** Department of Management and International Business, School of Business, Lappeenranta University of Technology, Lappeenranta, Finland

§ Department of Finance and Management Information Sciences, Labovitz School of Business and Economics, University of Minnesota Duluth, Duluth, MN, USA

Corresponding author: jpierce@d.umn.edu

https://doi.org/10.1017/jmo.2016.66 Published online by Cambridge University Press

within the organizational sciences, Druskat and Pescosolido noted that 'collective notions of ownership are commonplace among the members of a work team' (2002: 284). An outgrowth of current theorizing (Pierce, Kostova, & Dirks, 2003) on a sense of ownership at the individual level (IPO) the construct *collective psychological ownership* (CPO) has been defined as 'collectively held sense (feeling) that this target of ownership (or a piece of that target) is collectively ours' (Pierce & Jussila, 2010: 812). Differentiated from the sense of IPO, CPO is cast as a collectively held cognitive state (we, my team members, and I, collectively agree that this is OUR job); whereas IPO has been presented as a state that reflects a personal sense of ownership (these tools are 'mine'). CPO has also been differentiated from several other constructs that have been conceptualized at the team level. For example, CPO is seen as asking the question 'What do we collectively feel is ours?' while team commitment asks – Why are we here?, group identity inquires as to – Who are we?, and group potency questions – How efficacious are we?.

Recognizing the existence of collective attitudes toward the ownership of tasks to be performed (work) and the dramatic increase in the organizational use of teams, there emerges a need for scientific inquiry intended to illuminate 'how' team job design produces its work-related effects and what role does CPO play in the process. Standing in the way of this inquiry is the absence of a validated instrument for the measurement of CPO. We believe that the development of such an instrument will contribute significantly to our understanding of group-level phenomena (e.g., attitudes, behaviors); this is particularly true within work organizations that are relying upon work teams where interdependent member contributions are paramount. Within this scholarly context, we consider the major contribution of our work to be the development and presentation of construct validation evidence for an instrument for the measurement of CPO. While qualitative tools (e.g., storytelling, ethnography, content analyses) are available for the study of collective attitudes and behaviors toward objects in the work environment (e.g., tools, workspace, outcomes produced), inquiry following the cannons of the scientific method awaits the development and validation of an instrument for the measurement of CPO. This work is intended to enable scholarship addressing thought (e.g., team potency) and actions (e.g., team performance) associated with a collective sense of ownership (possession).

We start with an abbreviated review of the current theorizing on psychological ownership. Then, drawing upon the extant psychological ownership literature, we identify variables theorized (see Pierce & Jussila's, 2011 review of this work) to be a part of CPO's nomological network. Next, we report on the development and validation of an instrument for the measurement of CPO. Finally, we comment on the novelty, utility, strengths, and limitations of this work.

THE OWNERSHIP CONSTRUCT

Cutting across public and political discourse, as well as, several academic disciplines (e.g., economics, organizational studies, political science) there has been an extensive focus on 'ownership.' Ownership is commonly defined in terms of 'the legal right of possession,' or a 'bundle of rights' (e.g., right of control; Monks & Minow, 2001). As such, ownership is portrayed as something that is 'real,' existing outside of people's minds, values, and symbols.

The legal right of possession is not, however, the only means through which ownership claims are experienced and asserted. Witness, for example, children in the sand lot asserting 'mine' don't touch' in reference to a sandcastle that they had constructed. Addressing claims of this nature, Etzioni noted that ownership is a 'dual creation, part attitude, part object, part in the "mind," and part "real"' (1991: 466). Cutting across several disciplines (e.g., developmental psychology, geography, philosophy, sociology), scholarly writings have suggested that attitudes of object ownership are widespread and commonplace (cf. Isaacs, 1933; Heider, 1958).

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Building on the psychology of mine, possession, and property literature (e.g., Litwinski, 1947; Furby, 1978) Pierce, Kostova, and Dirks (2003) offered a theory of psychological ownership focused at the individual level of analysis. This personal sense of ownership expresses itself in terms of feeling that the target of ownership is exclusively mine (e.g., that book is 'mine'), or in recognition that others experience a sense of ownership for the same target (e.g., this commons is 'ours'). In the later instance the word 'ours' is a dual possessive pronoun, inclusive of the sense of 'mine.' In both instances this sense of ownership resides in the person's mind, and it is arrived at through the individual's independent journey (e.g., the exercise of control over a particular object).

Psychological ownership theory highlights the genesis of the sense of ownership, the motives that underpin its existence, target attributes that spawn feelings of ownership, and the 'routes' down which people travel (i.e., experiences) that gives rise to ownership feelings. Emerging empirical evidence, primarily from the organizational behavior, entrepreneurship, and the study of family-owned businesses has been largely supportive of psychological ownership theory (see Pierce & Jussila's, 2011 review) with observations of several positive (e.g., job satisfaction, stewardship, performance) and negative (e.g., information hoarding, stress from a burden of responsibility) effects produced by the sense of ownership.

CPO AS A UNIQUE STATE

Increasingly, organizational scientists have seen the importance of exploring phenomena at the team level (e.g., Steffens, Shemla, Wegge, & Diestel, 2014). Following the rise of teams as a corner stone of modern-day organizations (e.g., Tekleab, Quigley, & Tesluk, 2009; Mathieu et al., 2015), theorizing on numerous constructs (e.g., efficacy, esteem, performance), as well as the psychology of ownership has been extended from the individual to the collective level. Scholarly work treating the sense of ownership as a group phenomenon has in large part been influenced by Furby's (1980) acknowledgment of the existence of a collective psychology of possession, and Druskat and Pescosolido's (2002) suggestion that collective notions of ownership are commonplace among members of work teams. Also influential was Weick and Roberts' (1993) work dealing with the collective mind, along with thinking about distributive cognition (Hutchins, 1955) and transactive memory (Wegner, 1986). The scientific and practical importance of work at the collective level is highlighted by the previously documented efficacious effects of a shared mental model driving group activity (e.g., Thrasher, 1927; Yablonsky, 1962). This work speaks to the importance of collective-level theorizing on psychological ownership.

Scholars have acknowledged that a group is an entity with potentially great psychological significance to its members, and one that under certain conditions can develop a 'mind of its own' (Weick & Roberts, 1993; Cooke, 2015). In acknowledgment of this observation, Pierce and Jussila (2010) elaborated a construct they termed CPO. Their thinking was strongly influenced by work on territoriality (e.g., Altman, 1975; Brown, Lawrence, & Robinson, 2005; Brown & Crossley, 2008) and teamwork (e.g., Druskat & Pescosolido, 2002) which acknowledges the existence of a *collective sense of ownership – a socially constructed, shared mental model reflecting common beliefs about a group's possessive relationship with a target of ownership*.

Combining the notion of the potential emergence of collective structures in collective action contexts (Morgeson & Hofmann, 1999) with the work on psychological ownership theory (Pierce, Kostova, & Dirks, 2003), CPO was presented as an intersubjective sense of possession – a consensual, collective perspective toward object possession. Group identity (seeing oneself as a part of a group), answering the question 'who are we' is seen as a necessary through not a sufficient condition for the emergence of CPO. With possession being seen as its conceptual core, those who experience themselves as 'us,' must collectively arrive at the experience that a particular object is collectively 'ours.'

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Current theorizing on CPO highlights several distinguishing features (cf. Pierce & Jussila, 2010) that are consistent with more general distinctions between individual and collective phenomena (e.g., Morgeson & Hofmann, 1999). First, CPO is an abstraction developed to make sense of a group's possessiveness over material or immaterial objects; thereby, reflecting a collective cognition and the way group members collectively have come to sense their possessive reality. Second, consistent with the idea that individuals (e.g., their thoughts, actions) are the most elementary units of analysis in any social system (see Parsons & Shils, 1951) and that collective phenomena have the potential to emerge as individuals meet in time and space (Morgeson & Hofmann, 1999), CPO has been posited (Pierce & Jussila, 2010) to be an extension of psychological ownership as an individual-level phenomenon. That is, the collective sense of possession is seen as arising through interactive dynamics (i.e., 'group processes involving the acquisition, storage, transmission, manipulation, and use of information,' Gibson, 2001: 122) around a shared objective–experience relationship. Emerging is a collective sense of ownership for a particular target inclusive of each group member experiencing themselves as a party to that experience.

Third, extant theorizing on CPO (cf. Pierce & Jussila, 2010) identifies three 'routes' to this psychological state, which also reflects the above transition from individual to the group level. It is not just any collective action or experience that gives rise to this particular collective state. Instead, it is proposed that CPO may emerge as members of a social entity collectively recognize and experience that they (a) share and jointly experience control over an object, (b) come to intimately know and collectively negotiate the meaning of a target, and/or (c) mutually invest their related selves into the target of ownership. Consistent with Morgeson and Hofmann's (1999) thinking on multilevel research and theory development, it is believed that as organized individuals' paths to a personal sense of possession cross in time and space, they come to realize that they do not travel at random. Instead they share a path to the same destination. These joint experiences with a target create a collective sense of possession for that target.

Fourth, unlike psychological IPO, the genesis of CPO is proposed to lie in the social identity motive (Tajfel, 1981). This need to see one's self and to be seen by others as a part of a particular group, when coupled with one or more of the personal motives for possession (i.e., effectance [White, 1959]; home [Heidegger, 1967 [1927]]; self-identity [Dittmar, 1992]; stimulation [Darling, 1937]), facilitates the development of CPO by making the individual ready to be party to this collective possessive cognition. More specifically, 'these motives are seen as the primary reasons for the existence of CPO as opposed to being the direct cause of its occurrence' (Pierce & Jussila, 2010: 817), as they put individuals on one or more of the paths to collective feelings of shared ownership which ultimately serves in satisfying one or more of these motives. Unless the collective journey is driven by the social-identity motive, coupled with one or more of the motives that serve as the cause for the emergence of personal feelings of ownership the collective sense of ownership is unlikely to develop.

Finally, much in the same way that certain possessions at the individual level become a part of the 'extended self' (see James, 1890; Dittmar, 1992; Belk, 1988), objects of possession at the group level become a part of that which the group considers itself. In both cases, the loss or destruction of the target of ownership results in a diminution of the sense of self and the sense of us, as the target of possession has become part of that which one considers him/herself and the group considers itself.

CPO'S NOMOLOGICAL NETWORK

The two states of psychological ownership (i.e., the individual and the collective sense ownership) share in common many similarities and yet there are differences. The two constructs share in common a

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possessive core, many of the targets to which the sense of ownership can attach, a number of motivational conditions (e.g., self-identity), and routes traveled (e.g., control exercised over the target ownership) in the lead up to its emergence. Holding much in common, CPO (e.g., collectively, we feel that this space is 'ours') cannot exist without the simultaneous existence of a personal sense of shared ownership (e.g., I feel this space is 'ours') experienced by those individuals who make up the collective. This is because there cannot be collective structures without interactions among individuals (Morgeson & Hofmann, 1999), and there cannot be collective interactions without the acts committed by those individuals who compose the collective (Parsons & Shils, 1951).

Speaking to the distinctiveness between the two constructs, the conditions that give rise to psychological IPO are necessary, yet not sufficient to give rise to psychological ownership at the collective level. An active social identity motive (Tajfel, 1981) promoting the individual's awareness of an 'us' is necessary for the emergence of a personal sense of shared ownership (i.e., a sense of collective IPO). In addition, group member travels down one or more of the paths (e.g., exercised control) that give rise to personal feelings of individual ownership is a journey not traveled alone as one is accompanied, in time and space, by others enabling the individual sense of 'ours' to materialize. A collective sense of shared ownership can only emerge if the above-mentioned motivational and interactional conditions are right for all group members and thereby allows the emergence of psychological ownership as a collective structure. This leads us to propose the existence of CPO as a possessive state is related to, yet conceptually and empirically distinct from individual psychological ownership (cf. Pierce, Kostova, & Dirks, 2003), thereby representing a different level of analysis (Morgeson & Hofmann, 1999). Thus, we propose a positive and distinct relationship between IPO and CPO.

Drawing upon the existing psychological ownership literature at both the individual and collective level, we construct its partial nomological network. Each of the relationships portrayed in the network has been explicated in the published literature; as a consequence we have elected to avoid redundancy by recasting each relationship depicted in this model. For the hypothesized relationships presented at the individual level, the interested reader is directed to Pierce & Jussila's (2011) review of the psychological ownership literature. Theorizing on the network's hypothesized relationships at the collective level is clearly expressed in Pierce and Jussila (2010).

Examination of CPO's performance within its nomological network is a test critical for the demonstration of construct validity (Schwab, 1980). While the literature reveals many different collectives and targets of ownership, this research treats the work team as the collective of interest and the 'job' (i.e., the tasks that a work team and its members are called upon to perform) as the target of ownership. As such CPO for the job portrays a collective mind-set whereby each member of the collective shares the belief that 'we (my team members and I) collectively feel that this job belongs to US together.' Following the reasoning that CPO will lead to individual-level effects through the personal sense of shared ownership and the fact that many of the associated constructs are originally defined at the individual level we cull, from the extant literature, variables belonging in CPO's nomological network at both the individual and group level. Drawing upon this extant psychological ownership literature we test the following hypothesized relationships. At the individual level of analyses a positive relationship between CPO and each of the following variables has been hypothesized: affective organizational commitment, job satisfaction, experienced responsibility, personal initiative, and organizational citizenship behavior. In addition, the current literature hypothesizes a positive relationship between CPO and each of the following group-level variables: team potency, psychological safety, group learning and team performance effectiveness, and a negative relationship with social loafing. Figure 1 illustrates this hypothesized nomological network.

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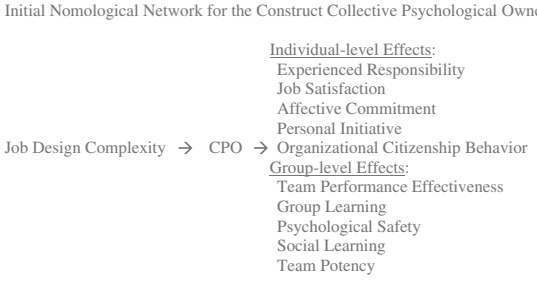

FIGURE 1. INITIAL NOMOLOGICAL NETWORK FOR THE CONSTRUCT COLLECTIVE PSYCHOLOGICAL OWNERSHIP

METHOD

Samples and data collection

Each sample described below was a convenience sample, and each was conducted with its expressed purpose being a contribution to the development and validation of an instrument for the measurement of CPO. In addition, each validation sample was designed to extend the previous study. The data for this investigation derives from a panel of judges comprised of five university professors of management and organizational behavior, from two US universities. Subsequent to our analyses of the work with the panel of judges, three field studies were sequentially conducted. The first field study (Validation Sample One: Computer Software Teams) was conducted among teams involved in the development of computer software. Members of software development teams were invited to participate by completing an on-line survey. We received data from 474 individuals, representing 275 different teams which ranged in size from two to ten. (In a few instances only one team member responded, which does not pose a problem as the data from Sample One was analyzed at the individual level.) These teams and their members were spread throughout the world and there was no way of determining their total number, and thus the response rate achieved. The second study (Validation Sample Two: Municipal Teams) was carried out in five Finnish municipal organizations. In total, 178 employees, from 60 teams performing different administrative functions (e.g., education, technical, social, and health care) completed a self-report, paper and pencil questionnaire. The response rate was 92%, and the teams ranged in size from two to seven members. For our third study (Validation Sample Three: Private Sector Teams), we employed a heterogeneous sample of employees, jobs, and teams (e.g., information technology, finance, public relations, human resources, service) drawn from 25 private sector organizations (e.g., investment, computer, hospital, automotive, accounting, and auditing) in the Tianjin area of China. Our Chinese Private Sector Teams consisted of 239 respondents who were members of 51 different teams. The response rate was 85.7, and these teams ranged in size from two to nine.

Variables and their measurement

All of the instructions and scale items appeared in English in Validation Samples One and Two, and in Chinese in Sample Three. Each of the measures was originally developed in English. Those appearing in Chinese were subjected to a systematic translation and back-translation procedure (Brislin, 1970). Except for CPO, all instruments used in our validation studies were previously developed and validated, and they are available in the public domain. Unless, otherwise noted, the variables mentioned below were assessed on a 7-point Likert-type scale anchored 1 = 'strongly disagree,' to 7 = 'strongly agree.'

Personal feelings of job- (work)-based *psychological ownership* was measured with the 4-item instrument developed and validated by Van Dyne and Pierce (2004). 'This is MY job' is a sample item.

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Experienced personal responsibility was assessed with three items (e.g., 'I feel a very high degree of personal responsibility for the work I do on this job') from Hackman and Oldham (1975). A*ffective commitment* derived from the work of Meyer and Allen (1991). 'This team has a great deal of meaning to me' is a sample item. *Job satisfaction* was measured with a 4-item measure (e.g., 'I am extremely satisfied with my current job') with items adopted from Smith (1976) and Farrell and Rusbult (1981). Smith, Organ, and Near's (1983) 10-items (e.g., 'I am always ready to help my co-workers in their tasks') for the measurement of *citizenship behavior* was employed. We examined *personal initiative*, a dimension of organizational citizenship behavior, with Moorman and Blakeley's (1995) 5-item instrument. A sample item includes, 'Often motivate others to express their ideas and opinions.' This later set of items were measured on a 5-point response scale, which was anchored 1 = 'not at all characteristic,' to 5 = 'very characteristic' of your behaviors as a member of this team.

Edmondson's (1999) instrument was employed to assess *group learning*. The seven items (e.g., 'We regularly take time to figure out ways to improve our team's work processes' were assessed on a 5-point scale anchored 1 = 'very inaccurate,' to 5 = 'very accurate' in terms of how descriptive each item is of the team. *Psychological safety* was assessed with Edmondson's (1999) 7-item instrument. An example of the items responded to is, 'It is safe to take risk on this team.' We employed George's (1992) instrument to assess *social loafing*. Each team member was asked how descriptive 10 items (e.g., 'Members of this team commonly defer their responsibilities to others') were of team member behavior. These items were responded to on a 5-point scale anchored 1 = 'not at all characteristic,' to 5 = 'very characteristic.' *Group potency* was assessed with an 8-item scale (e.g., 'To what extend does your team have confidence in itself?') taken from Guzzo, Yost, Campbell, and Shea (1993). These items were responded to on a 5-point scale anchored 1 = 'to no extent,' to 5 = 'to a great extent.' Campion, Papper, and Medsker's (1996) 9-item instrument for the measurement of *team performance effectiveness* was employed. Each team member was asked to evaluate the effectiveness of their team. The instrument is multidimensional in that it seeks to generate an assessment of nine performance effectiveness dimensions (e.g., quality, member satisfaction, completing work on budget). A 7-point response scale, anchored '1 = poor,' to 7 = 'outstanding,' was employed.

Finally, a literature review failed to uncover a research instrument for the measurement of CPO. In the next section, we comment on the need for and steps taken (see Schwab, 1980; Hinkin, 1995) to develop and provide construct validation evidence in support of a measure of CPO.

Measurement of CPO

The need for a measure of CPO

It seems reasonable to inquire as to why there is a need to develop and validate an instrument for the measurement of CPO, when there is an instrument that has gone through the development and validation process for the measurement of IPO. Why not simply aggregate from the individual to the group level?

The Van Dyne and Pierce (2004) instrument focuses on 'me' and that which one considers 'mine.' Thus, its locus is in the individual psychological owner's mind (cf. Etzioni, 1991). As conceptualized, CPO is a collective cognition arrived at among two or more interdependent individuals who have engaged in group processes (i.e., explicit communications; 'processes involving the acquisition, storage, transmission, manipulation, and use of information;' Gibson, 2001: 122) around a shared object–experience relationship. Cooke describes this shared mental model's emergence as taking place through interactions where 'team members coordinate cognitively with one another, integrating ideas and creating new knowledge' (2015: 416). Thus, it is through these collective, interactive group processes that a shared, possessive mind-set that we as one (i.e., a collective whole) have a sense of ownership for a particular object emerges. Like 'team cognition' (cf. Cook, 2015), CPO is inextricably tied to context

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which consists of the other members of the collective (e.g., work team), their temporal and collective experiences around a target of ownership. As such, CPO is to be understood when the collective is the unit of analysis. Thus, this intersubjective sense of possession manifests itself when it is experienced as an 'extended part of the collective's sense of itself,' as possessions at the individual level come to be experienced as an 'extended part of the self' (cf. James, 1890; Dittmar, 1992; Belk, 1988). It has been argued theoretically (Pierce & Jussila, 2010) that CPO does not reside in the mind of each individual member of the collective, instead it resides in the group and at the intersection of their shared mental model.

Thus, CPO is fundamentally different from two or more individuals, who at the same or at different times, come to a personal realization that they feel a sense of ownership for an object for which others may have similar feelings. For example, many university faculty typically refer to the university's library as our library. This is a condition where they independently acknowledge a sense of ownership for the library through the use of the pronoun 'our.' A condition not arrived at through shared experiences, and interindividual dynamics centered on that target of ownership. As such CPO reflects the way an intimately linked group of individuals have come to sense their possessive reality.

Unlike IPO, this shared object–experience relationship stems in time and space from joint travels down one or more paths (e.g., shared and jointly experienced control over an object; mutual investment their related selves into the target of ownership) associated with the emergence of this collective sense of ownership. The emergence of this collective cognition (i.e., a group's mind of its own; cf. Weick & Roberts, 1993) is missing from the simple aggregation of personal feelings of ownership. Since it does not exist within the mind of each team member it cannot be based on simple aggregation of what is in each team member's mind just as 'communication and interactions cannot be studied meaningfully at the individual level' (Cooke, 2015: 416).

The path to instrument development and construct validation

Construct validation concerns itself with providing evidence suggesting the 'correspondence between a construct (conceptual definition of a variable) and the operational procedure to measure or manipulate that construct' (Schwab, 1980: 5–6). Our efforts to develop and validate a measure of CPO involved the development of a set of items, which was followed by the use of a panel of judges, and then three sequentially conducted field studies. The panel of judges and Samples One and Two were employed primarily for the development of the instrument. Samples Two and Three were employed for confirmation of the instrument's structure and the demonstration of its construct validity via demonstration of discriminant and nomological validity.

Following the recommendation of Kozlowski and Klein (2000) for measurement of variables consisting of shared unit properties (e.g., CPO), we initially assessed our items for the measurement of CPO at the individual level. In addition and because the existence of CPO implies the existence of IPO (just not exclusively so), we reasoned that virtually all of the construct validation evidence (e.g., content validity, internal consistency, and test-retest reliability, discriminant and nomological validity) in support of the measurement of IPO (see Pierce, Van Dyne, & Cummings, 1992; Van Dyne & Pierce, 2004) plays a constructive, though not a sufficient, role in the establishment of support for the construct validity for the measurement of CPO.

Instrument development

Building off of Kozlowski and Klein's (2000) thinking about the transition of constructs with shared unit properties from the individual to the group level, we note that the sense of ownership at the team (collective) level implies a sense of IPO. Thus, we employed Van Dyne and Pierce's (2004) measure of IPO to guide our construction of eight items for the measurement of CPO. The major difference is that their instrument taps into personal feelings of ownership for the job (e.g., 'This is my job'

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'I feel a very high degree of personal ownership for this job'). The items employed in our work were written to reflect a team member's sense of collective ownership (e.g., 'We [my team members and I] collectively agree that this is OUR job') that is shared or held in common with their other team members. These items differ from the items employed to measure the sense of IPO in that the IPO places its focus on personal feelings of ownership (e.g., 'I sense …,' 'This job is MY job.'). CPO, on the other hand, places an emphasis on such collective terms as (a) 'we my team members and I,' (b) 'collectively agree,' along with (c) the additional reference to the self and others (e.g., 'ours,' 'US together,' 'own this job together' 'collective [team] ownership' in the ownership experience).

To assist with the development of a homogeneous set of scale items, and to provide initial insight into the instrument's face, content, and discriminant validity we assembled a panel of judges, requesting that they perform three functions. First, the panel was provided Pierce and Jussila's (2010) conceptual definition and elaboration of the CPO construct, and they were asked to identify existing constructs with which job-based CPO might be seen as redundant. Second, building upon the first step the panel was given the conceptual definition and the randomized ordering of 32 items for the measurement of CPO, along with the conceptual definition and items for the measurement of the rival constructs (i.e., affective commitment, satisfaction, identification, and internalization), each framed at the team level (e.g., affective team commitment, team identification) that were identified as a part of the panel's initial task. The panel was then asked to sort and match each item with its variable's conceptual definition. Finally and upon completion of this process, they were asked to write additional items if they perceived there to be inadequate coverage of CPO's content domain.

Across the five-person panel, the eight CPO items were correctly identified 92.5% of the time (i.e., in 37 out of 40 instances). Contamination of the CPO instrument occurred in only 2.5% of the 120 instances.

In summary, these results suggested a reasonable level of homogeneity of scale items as most of the *a priori* items were correctly identified as measuring CPO. Substantive issues pertaining to contamination of the construct's domain, or its deficiency were not identified; thereby, providing evidence in support of CPO's content validity. Finally, these qualitative observations reveal good discriminate validity distinguishing CPO from a set of variables which also depict a psychological relationship (e.g., team membership: satisfaction, commitment, identification) that individuals form through their work team involvements.

RESULTS

Instrument purification

Following item generation, the assembly of evidence in support of content validity, as well as, the homogeneity of scale items and qualitative evidence in support of discriminant validity we turned our attention to a quantitative purification of previously discussed 8-item CPO measure.

Preliminary analyses performed on eight items emerging from Validation Sample One revealed a coefficient α of 0.56. An α value that falls short of acceptability (DeVellis, 1991). This prompted the conduct of exploratory factor analyses, deemed appropriate for the examination of homogeneity of scale items during the early stages of scale development (Tabachnick & Fidell, 2007). While a single factor solution (i.e., eigenvalue >1.0) emerged, the interitem correlations ranged between 0.28 and 0.87 prompting the decision to drop items with the weakest loadings and proceed to the next stage with four of the original eight items. This step improved the internal consistency reliability estimate to 0.89.

Still operating in what can be considered the early stages of scale development, exploratory factor analyses was performed on the four items that emerged from Validation Sample One with data from Validation Sample Two. Consistent with the outcome from Validation Sample One, a one factor

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solution (eigenvalue >1.0) accounting for 72% of the variance emerged. Factor loadings ranged between 0.82 and 0.88 and the resulting coefficient α was 0.83.

The final step in our purification effort involved looking to see if the ownership items operationalized at the individual and collective levels were distinct and yet related to one another. A two factor solution (eigenvalues > 1.0), with 79% of the cumulative variance was observed. The CPO items cross-loaded with IPO in the range of 0.00–0.37. No IPO item loaded >0.28 with the CPO factor. This IPO item employed the pronoun 'our' and *a priori* it was expected to load with the other collective ownership items. These observations provide evidence suggesting the distinctiveness, as well as, the homogeneity of the developmental CPO instrument. While distinct from one another, IPO and CPO correlate 0.54 ($p < .01$). With 29% shared variance, CPO appears to represent a domain that is unique to a sense of IPO.

Toward construct validation: the next stage in scale development

Instrument purification leaves us with a parsimonious, single factor, 4-item instrument (see Table 1) with good internal consistency reliability. These observations prompted us to proceed to the next level of scale development, and an examination of the developmental instrument's discriminant and nomological validity.

Discriminant validity

We started with an examination of CPO's discrimination from IPO, experienced responsibility, and personal initiative by performing confirmatory factor analysis (CFA) on the data from Validation Sample One. These results show that the 4-item CPO factor had very good fit with the data (Hu & Bentler, 1999). We observed $\chi^2_{(2)} = 1.096$ ($p > .05$), RMR = 0.024, GFI = 0.99, AGFI = 0.99, NFI = 1.00, and RMSEA = 0.01. The standardized factor loadings for the four items were 0.78, 0.89, 0.88, and 0.74. Based on this we calculated a composite reliability of 0.87, and we observed an average variance extracted (AVE) of 0.68. The square root of the AVE of CPO (0.83) was higher than the

Table 1. Instrument for the measurement of collective psychological ownership

Instructions: Think about the house, automobile, work space, or some other item that you own or co-own with someone, and the experiences and feelings associated with the statement 'THIS IS OURS!' The following questions deal with the 'sense of ownership' that you and your work team members feel for work that you do. Indicate the degree to which you personally *agree* or *disagree* with the following statements.

1 = Strongly disagree
2 = Disagree
3 = Moderately disagree
4 = Neither agree nor disagree
5 = Moderately agree
6 = Agree
7 = Strongly agree

1. We (my team members and I) collectively agree that this is OUR job
2. We (my team members and I) collectively feel that this job belongs to US together
3. We (my team members and I) feel a very high degree of collective (team) ownership for this job
4. All of the members of my work team feel as though we own this job collectively

Note. Dependent upon the group being studied the term 'work team' appearing in each of the items may need to be worded differently (e.g., crew, team mates), and the target of ownership is changeable. Scoring of collective psychological ownership is determined by calculating the team's mean score.

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correlations between CPO and IPO, experienced responsibility, and personal initiative all of which were <0.55. This evidence demonstrates the discriminate validity of CPO in Sample One.

Next we looked for evidence of discriminant validity by employing CFA on data from Validation Sample Two. The results from our Finnish sample at the individual level shows that the 4-item CPO factor had very good fit with the data (Hu & Bentler, 1999). Specifically, we observed $\chi^2_{(2)} = 0.89$ ($p > .05$), RMR = 0.021, GFI = 0.99, AGFI = 0.99, NFI = 0.99, and RMSEA = 0.01. The standardized factor loadings for the four items were 0.70, 0.79, 0.78, and 0.72. Based on this we calculated a composite reliability of 0.74, and we observed an AVE of 0.56. The square roots of the two AVEs of CPO (0.75) was higher than the correlations between CPO and job satisfaction, affective commitment, and citizenship behavior, all of which were <0.47. This evidence demonstrates the discriminant validity of CPO in Sample Two.

In sum, this wave of evidence, involving data from Validation Samples One and Two, suggests that the measurement of CPO discriminates from IPO, experienced responsibility, personal initiative, affective commitment, job satisfaction, and organizational citizenship behaviors.

Nomological validity

Schwab (1980) noted that an important test of a measure's construct validity is its performance within its nomological network. In order to address that issue we employed both Validation Samples One and Two enabling an examination of a set of relationships seen as a part of CPO's nomological network. Tables 2 and 3 present the descriptive statistics (i.e., means, standard deviations), and correlations among this set of variables.

From Validation Sample One and at the individual level of analysis, we observed support for the relationships expressed in CPO's nomological network. Specifically, CPO's correlations ranged between 0.15 ($p < .01$) with personal initiative and 0.54 ($p < .01$) with IPO. These observations support relationships as theorized in the psychological ownership literature (see Pierce & Jussila, 2011). In addition, from Validation Sample Two we observed significant ($p < .01$) correlations with CPO range between 0.34 and 0.46 involving affective commitment, job satisfaction, and citizenship behaviors. Finally and from Validation Sample Three and at the individual level, we observed CPO's significant relation with performance effectiveness ($r = 0.44$, $p < .01$), social loafing ($r = -0.29$, $p < .05$), and group potency ($r = 0.38$, $p < .01$).

Table 2. Validation Sample One descriptive statistics and collective psychological ownership (CPO) correlations: individual level

	Mean	*SD*	*n*	α	*CPO rs*
CPO	4.59	1.57	474	0.89	–
Psychological ownership	3.84	1.70	418	0.84	0.54**
Experienced responsibility	5.57	1.22	397	0.80	0.28**
Personal initiative	3.75	0.82	372	0.81	0.15*
Demographics					
Gender	98% male				0.07
Age	47% <31 years				−0.05
Education	42% post bachelor's degree				−0.03
Team tenure	3% <3 years				0.05

Note. Missing data accounts for the variability in the reported *n*.
*$p \leq .05$, **$p \leq .01$.

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TABLE 3. VALIDATION SAMPLE TWO'S DESCRIPTIVE STATISTICS AND COLLECTIVE PSYCHOLOGICAL OWNERSHIP (CPO) CORRELATIONS: INDIVIDUAL LEVEL

	Mean	*SD*	*n*	α	*CPO rs*
CPO	4.66	1.19	178	0.79	–
Affective commitment	4.53	1.31	177	0.69	0.46**
Job satisfaction	5.63	1.10	177	0.82	0.42**
Citizenship behavior	5.60	0.76	176	0.83	0.34**
Demographics					
Gender		82% female			0.04
Age		45% between 45 and 54			0.05
Education		20% bachelor's degree			−0.10
Team tenure		12 years			0.02

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

The analyses and validation evidence that has been presented thus far has been performed at the individual level predicated upon notion that collective feelings of ownership need to manifest at that level in order for its presence to exist at the group level. These observations provide preliminary support for CPO's nomological validity.

Validation at the cross-level

At this stage in the validation process our primary focus was on relationships at the collective level. Employing Pierce and Jussila's (2010) theoretical explication of CPO, we constructed a nomological network for CPO. This enabled an examination of the developmental instrument's performance within that network in a team work context.

Analysis

Preliminary steps taken in our data analysis included the following. First, we inspected internal consistency reliability. Second, following Kozlowski and Klein (2000) suggestions for the measurement of variables consisting of shared unit properties, data collected at the individual level from each team member were aggregated to the group level. Third and influenced by the work of Wageman, Hackman, and Lehman (2005), we looked to see if we were dealing with 'real teams' reflected by (a) team membership clarity (i.e., everyone knows exactly who is and is not a team member), (b) team membership stability (i.e., membership on the team has been stable for the past two or more months), and (c) team member interdependence (i.e., members of this team have to depend heavily on one another to get the team's work done). In the absence of established norms, we employed an *a priori* criteria of 3.25 (an above the mid-point marker on the 5-point scale [anchored 1 = 'very inaccurate,' to 5 = 'very accurate']) to judge the extent to which each team is a real team. All of the 51 teams involved in our analyses were could be characterized in terms of team membership clarity, stability, and interdependence.

Observations

Coefficient α values for variables assessed in Validation Sample Three, fall within the range of acceptability (LeBreton & Senter, 2008), ranging between 0.71 and 0.94. Next, we moved our analyses to the team level. To commence, we tested interrater reliability to make sure that team

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member ratings were reasonably homogeneous, with greater between than within group variance. Employing $r_{wg(j)}$ (James, Demaree, & Wolf, 1993), the median indices for six variables across the 51 teams ranged from 0.66 to 0.88. Acknowledging that any heuristic is somewhat arbitrary in nature, LeBreton and Senter (2008) provided a simple set of guidelines to judge levels of interrater agreement. Based upon their revised interrater agreement standards, five of our variables were seen as possessing 'strong agreement' with values ranging between 0.71 and 0.88, and one judged as possessing 'moderate' level of agreement with value of 0.66 for $r_{wg(j)}$.

CFA on the developmental instrument in Validation Sample Two at the team level revealed that the 4-item CPO factor had very good fit. Specifically, we observed $\chi^2_{(2)} = 1.94$ ($p > .05$), RMR = 0.024, GFI = 0.99, AGFI = 0.97, and RMSEA = 0.01. The standardized factor loadings for the four items were 0.79, 0.86, 0.79, and 0.74, and based on this we calculated a composite reliability of 0.83, and AVE was 0.63. CPO's structure was also subjected to CFA employing Validation Sample Three. The results paralleled those found in Validation Study Two. The 4-item CPO factor had good fit with the data (Hu & Bentler, 1999). Specifically, we observed $\chi^2_{(2)} = 2.15$ ($p > .05$), RMR = 0.01, GFI = 0.99, AGFI = 0.98, NFI = 0.99, RMSEA = 0.02. The standardized factor loadings for the four items were 0.78, 0.89, 0.88, and 0.74, respectively, based on this we calculated composite reliability of 0.89 and the AVE was 0.68.

In addition, we were able to examine CPO's *incremental validity* by treating team performance effectiveness as the criterion variable. After regressing team performance effectiveness on group potency, the addition of CPO, with a β coefficient of 0.36 ($p < .01$), accounted for a significant 11% additional criterion variance. In addition, regressing performance effectiveness on social loafing and CPO, resulted in CPO's 21% increase in variance explained above that accounted for by social loafing. In addition, CPO had a β coefficient of 0.48 ($p < .01$).

Team-level nomological validation

For analyses at the collective level, the descriptive statistics (i.e., means, standard deviations) and correlations among the study variables are presented in Table 4. Internal consistency reliability for the measurement of CPO was 0.94. A bivariate examination of the hypothesized relationships reveals support for CPO's significant relationship with social loafing ($r = -0.33$, $p < .05$, group potency ($r = 0.41$, $p < .01$), and team performance effectiveness ($r = 0.49$, $p < .01$). Failing to achieve statistical significance is the relationship between CPO, and group learning and psychological safety.

Table 4. Validation Sample Three's descriptive statistics and collective psychological ownership (CPO) correlations: cross-level

	Team level of analysis					*Individual level*
	Mean	*SD*	α	r_{wg}	*CPO*	*CPO*
CPO	5.99	0.57	0.94	0.76	–	–
Group learning	3.61	0.54	0.84	0.66	−0.15	0.07
Psychological safety	4.15	0.35	0.81	0.71	0.12	0.10
Performance effectiveness	5.71	0.49	0.92	0.81	0.49**	0.44**
Social loafing	1.83	0.55	0.94	0.81	−0.33*	−0.29**
Group potency	4.30	0.31	0.89	0.88	0.41**	0.38**

Note. Demographically: 52% female; 97% with a bachelor's degree of more; 70% between 26 and 40 years; 47% team tenure between 2 months to 1 year.

r_{wg} – interrater agreement; correlation decimals have been omitted; n = 51 (team level); n = 239 (individual level).

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

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Further support for nomological validity comes from Tseng and Uen's (2013) study of 44 teams working in the hospitality industry in Taiwan. In support of their hypothesized relationships they found a significant relationship linking CPO with transformational leadership ($r = 0.86$, $p < .01$), organizational commitment ($r = 0.74$, $p < .01$), and organizational citizenship behavior ($r = 0.43$, $p < .01$). Employing hierarchical linear modeling and Sobel test analysis, they also reported observing CPO's mediation of the relationships between transformational leadership, and commitment and citizenship behaviors.

In summary, these findings provide evidence in support of nomological validity for CPO. Out of the 11 relationships examined in our work, only those between CPO and, psychological safety and group learning failed to attain statistical significance.

DISCUSSION

A study makes a contribution when it serves to advance understanding and scientific research. We start our discussion by specifying the novelty of our work, along with comments on its utility for the advancement of future scholarship.

The originality of the study at hand

The CPO construct (i.e., the collective sense of 'ours') was presented by Pierce and Jussila (2010) in their theoretical work on CPO. We take that work an important step further by presenting an instrument for the measurement of CPO that derives from four validation studies which speak to the instrument's construct validity, along with some supporting evidence from Tseng and Uen's (2013) Taiwanese study. Our effort began with a qualitative study employing a panel of judges. The results of this effort provided a homogeneous set of items for the measurement of CPO. In addition, this effort provided support of the proposed instrument's face, content, and discriminant validity.

Next, three sequentially arranged validation samples were employed. The first two samples were employed to aid instrument purification. These findings left us with an instrument that has good internal consistency reliability, unidimensional factor structure, convergent, discriminant, and nomological validity. Employing the third validation sample, CFA verified the factor structure and discriminant validity that emerged from the first two validation studies. As to discriminate validity evidence derived from the validation samples suggests CPO's discrimination from such variables as: team identification, team commitment, and team potency. Observations provide initial evidence in support of CPO's incremental validity in its relationship with team performance. In addition, examination of CPO within both its individual- and team-level nomological networks provided evidence of nomological validity. Finally and as theorized, we observed that IPO and CPO are related, share a small percent variance and load on two distinct factors. This suggests that they represent unique domains and that aggregated IPO scores across a group of individuals is unlikely to be a viable substitute for the measurement of CPO. In addition, it has been argued that the two constructs are fundamentally distinct (e.g., they differ in terms of the locus of the construct, the role played by the social identity motive, emergent processes, the role of joint experiences). Finding a lack of redundancy highlights a potentially meaningful role to be played by CPO in the conduct of team-level research, informing our understanding of the emergence, and effects associated with a collective mind-set around possessive experiences.

In summary, we present for future use an instrument for the measurement of CPO, an instrument with evidence in support of its construct validity. In addition, the instrument presented here can be employed with multiple targets of ownership, material, and immaterial in nature.

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Utility for the advancements for future research

The instrument validated in this study is likely to prove extremely useful for future research focused on the study of teams in work organizations. In addition, it will enable scholars working in management and organizational behavior, as well as, other disciplines (e.g., industrial and organizational psychology, sociology) who are interested in the emergence and effects associated with a collective sense of possession (i.e., a collective mind-set) to move forward empirically.

We encourage continued validation research as the validation process should be an on-going affair. To this end, we suggest further theorizing and an expansion of CPO's nomological network, and work directed toward the identification and discrimination from other constructs with which CPO may seem as possibly redundant. We provided some evidence as to CPO's incremental validity an end to which future inquiry should be directed. Finally, future validation research should employ methods that move this work beyond the limitations noted in the next section.

Limitations and strengths

The work presented here is limited by its reliance upon a cross-sectional and correlational design, both of which restrict comments regarding causal connections. The relationships examined here only mirror what would exist under experimental designs. The use of three different samples drawn from a variety of jobs, teams, and organizations contribute to the study's external validity. A further contribution to external validity stems from the use of culturally diverse samples. The correlational design employed leaves threats to internal validity uncontrolled.

All of our data is of a self-report nature leaving open the chance that one or more of our findings are due to common method effects. While Spector (2006) argued that concerns expressed over common method bias are largely an 'urban legend,' Lance, Dawson, Birklebach, and Hoffman's (2010) review led to the conclusion that 'same-method correlations are not routinely upwardly biased' (Conway & Lance, 2010: 332), we were conscious of possible common method effects. This prompted us to adopt several recommendations advanced by Conway and Lance (2010) and Podsakoff, MacKenzie, Lee, and Podsakoff (2003) such as: with the exception of CPO all measures employed had gone through *a priori* construct validation, employment of numerous response scales, and the introduction of each variable with its own instructions. In addition, if common method bias was at work it would seem reasonable that CPO's relationship with psychological safety and group learning would also have been significant.

Finally, our use of multiple and diverse samples, the use of real teams in real work organizations, convergent observations, the confirmation of *a priori* theorized relationships, and efforts to minimize common method bias are seen as some of the strengths of this work.

Conclusion

We acknowledge that the validation process is never complete. Based upon the strength of the findings presented here, we are comfortable in encouraging the conduct of substantive research focused on these and other individual- and group-level effects within the work and organizational context, as well as across different types of collective undertakings (e.g., sporting groups, social movements).

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