

# The effect of organizational learning on business sustainability – the role of distributed leadership

The effect of  
organizational  
learning

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## Abstract

**Purpose** – The paper aims to investigate the importance of leadership – distributed leadership (DL) – for the relationship between organizational learning (OL) and business sustainability (BS).

**Design/methodology/approach** – Extensive literature research was carried out to investigate the relationship among leadership, OL and BS. Two theoretical frameworks of the relationship among DL, OL and BS were formulated and tested on the basis of the empirical studies conducted in 694 Polish and Danish companies. The moderated multiple regression and mediation analysis were used.

**Findings** – In-depth, critical literature analysis has shown that the theoretical foundation of the relationship between leadership and BS is limited and not empirically verified. However, the empirical study has revealed a positive, statistically significant effect of DL on both OL and BS and the mediating role of OL on the relationship between DL and BS (a partial and complimentary mediation).

**Research limitations/implications** – It would be valuable to simultaneously consider other leadership types (beyond DL) in terms of their impact on OL and BS. Additionally, due to the nature of BS challenges and the specificity of DL, other factors influencing BS should be included for a more profound understanding of the relationships under investigation. Finally, additional contextual factors need to be taken into account.

**Originality/value** – To the best of the authors' knowledge, the paper is one of the first studies that present the relationship between OL and BS with reference to factors influencing BS, i.e. leadership. The value of the paper is the development of two alternative models of the relationship among DL, OL and BS and their verification through large-scale empirical cross-country research. Furthermore, the results obtained in the course of the research open up new research directions with respect to the development of the concept of sustainable leadership and deepen the knowledge of the relationship between leadership types and OL.

**Keywords** Business sustainability, Organizational learning, Performance, Leadership, Distributed leadership

**Paper type** Research paper

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## 1. Introduction

The importance of organizational learning (OL) for a business shift to be more sustainable has already been recognized. Although the role of OL in shaping business sustainability (BS) is still poorly defined and justified, important conceptual frames of highly complex and multi-faceted phenomena are being developed: OL and BS and their relations, and the first empirical verifications are reported (Hermelingmeier & von Wirth, 2021; Zgrzywa-Ziemak & Walecka-Jankowska, 2021). However, the relationship between OL and BS is still considered in isolation from internal and external factors. Leadership is recognized as a crucial factor in shaping both BS (Avery & Bergsteiner, 2011; Bendell, Sutherland, & Little, 2017; Galpin & Whittington, 2012) and OL (Berson, Nemanich, Waldman, Galvin, & Keller, 2006; Park & Kim, 2018; Senge, 1990; Yukl, 2009).

In the research on OL, types of leadership supporting OL are widely discussed, recognized and empirically verified (Senge, 1990; Berson et al., 2006; Garvin, Edmondson, & Gino, 2019; Do & Mai, 2020). Although leadership is also indicated as a key driver of BS, the literature still lacks both a theoretical and empirical basis for leadership conducive to BS (Armani, Petrini, & Santos, 2020; Brandt, 2016; Hallinger & Suriyankietkaew, 2018). More and more intensively, the concept is beginning to be analyzed and conceptualized in the context of the theory of leadership, which results in identifying its characteristics (e.g. Bendell et al., 2017; Metcalf & Benn, 2013) and even formulating its separate definitions (e.g. Bendell et al., 2017). One of the significant themes emerging in the debate over BS-supportive leadership is the discussion of whether the concept of leadership for BS should be focused on the role of heroic leaders, mainly at the top of the organization (e.g. Epstein & Buhovac, 2014), or whether it is the concept of distributed leadership (DL) (e.g. Kopnina & Blewitt, 2018). The very same issue is considered in the literature in relation to OL-supportive leadership (Do & Mai, 2020). While both research lines remain unexplored, we contemplate a more promising direction in the realm of DL [inherent in the organic leadership paradigm according to Avery (2004)], which is deemed more suitable for addressing the intricate and rapidly evolving issues of sustainable development. In the context of the identified discrepancies and gaps, a research question arises:

*RQ1.* Whether and what is the importance of distributed leadership in shaping the relationship between OL and BS?

The paper aims to examine DL as a factor important for the relationship between OL and BS. The literature review, in the initial part, introduces the conceptualization of BS and elucidates the pivotal role of OL in its formation. Subsequently, a discourse unfolds on various, at times contradictory, theoretical perspectives regarding the influence of leadership on OL and BS (resulting in the formulation of separate research hypotheses on the impact of DL on OL and DL on BS). Concluding the literature review, two theoretical models were developed delineating the role of DL for the OL–BS relationship, which involved proposing two further research hypotheses. The empirical section presents the results derived from the verification of these hypothetical models, conducted on a sample of 694 companies operating in Poland and Denmark, using moderated multiple regression and mediation analysis.

The article is one of the first studies that present the relationship between OL and BS with reference to factors influencing BS, i.e. leadership. The value of the paper is the development of two alternative models of the relationship among DL, OL and BS and their verification through large-scale empirical cross-country research. Furthermore, the results obtained in the course of the research open up new research directions with respect to the development of the concept of sustainable leadership and deepen the knowledge of the relationship between leadership types and OL.

## 2. Literature review

Different approaches to BS are presented in the literature and management practice, which do not allow for formulating a single, unambiguous concept of BS. On the one hand, BS is a complex, multi-faceted phenomenon, integrating some, often contradictory, aspects (Dyllick & Muff, 2016; Hahn, Figge, & Pinkse, 2018). On the other hand, however, BS concepts are rooted in different sustainability paradigms (Gibbons, 2020).

Some researchers recognize the creation of long-term shareholder value as the essence of BS, where social and environmental concerns are essential in the context of opportunities and risks, benefits and costs, that are crucial for building this value. This represents an instrumental approach (Gao and Bansal, 2013). BS refers here to the survival and development of the organization as a system (Ihlen, 2015), and it is rooted in the conventional sustainability paradigm (Gibbons, 2020). A radically different perspective is presented by those who see the organization as “a mesoscale social artefact in need of consideration as a possibly potent means of approaching sustainable development” (Parrish, 2007, p. 848). According to Dyllick & Muff (2016), a truly sustainable organization creates a significant positive impact in the areas that are critical and relevant for society and the planet. In this context, although the organization has to generate the profit necessary for its functioning and development, its overriding objective is a commitment to developing a broader socio-ecological system. This holistic, integrative approach (Gao and Bansal, 2013) is rooted in the regenerative paradigm (Gibbons, 2020). There are also intermediate approaches between the extremes of instrumental and holistic. The prevailing is the win-win approach, the essence of which is a simultaneous, synergistic, systematic provision of economic, social and environmental benefits (Sekerka and Stimela, 2011). The win-win approach focuses on finding cost-effective areas for the organization which are, at the same time, socially and/or environmentally beneficial (Porter and Kramer, 2011). This approach avoids a deeper reflection on the systematic responsibility of the organization; it is based on the current assumption of proceeding in its own interest. This approach is rooted in the contemporary paradigm by Gibbons (2020). In the paper, it is assumed that BS refers to the participation of the business in sustainable development; it is defined as “the business’s commitment and activities for the benefit of contributing to sustainable development” (Zgrzywa-Ziemak, 2019, p. 1792). This holistic approach to BS (Dyllick & Muff, 2016) is embedded in the regenerative paradigm (Gibbons, 2020).

To identify the current state of knowledge on the role of leadership in the relationship between OL and BS an extensive literature review was conducted, including analysis of articles, books and conference proceedings obtained from Scopus and WoS databases. First search was focused on papers directly related to the aim of the research, it was considered that their titles should include words: “lead\*” and “learning” and “sustainab\*” (published between 2013 and 2023, in English, in the field of “business, management and accounting” in Scopus/management and “business” in WoS). A total of 18 articles were obtained (without duplicates), of which only 3 were found to be substantively relevant. Due to very limited results, hardly relevant to the problem studied more extended search was performed. The OL–BS, leadership-BS and leadership-OL relationships were examined separately, with the following words in literature items’ titles: “learning” and “sustainab\*”; “leader\*” and “sustainab\*”; “leader\*” and “learning”; “learning” and “sustainab\*” and “leader\*”, using a keyword-related restriction that varied by individual search (words related to OL and learning organization, and business/corporate/organizational sustainability and sustainable business/organization). After removing duplicates related to the use of two databases and conducting 4 separate searches, 272 literature items were obtained. A detailed review of abstracts aimed to isolate papers dedicated to the relationships analyzed, resulting in a total

of 66 scientific items. During the study, for substantive reasons, some of the identified papers were excluded, while a few papers that are not indexed in the selected databases were included.

### *2.1 Organizational learning and business sustainability*

The importance of OL for an organizational shift to be more sustainable has already been recognized (Edwards, 2009; Hermelingmeier & von Wirth, 2021; Lozano, 2014; Molnar & Mulvihill, 2003; Wilson & Beard, 2014; Zgrzywa-Ziemak & Walecka-Jankowska, 2021). Most of all, OL and a learning organization are treated as tools to make changes in the direction of the most sustainable organization, even as a key element of any effort to implement sustainable development in organizations effectively (Battistella, Cicero, & Pregonella, 2021; Jamali, 2006; Müller & Siebenhüner, 2007; Espinosa & Porter, 2011; Zgrzywa-Ziemak & Walecka-Jankowska, 2021) or a catalyst and direction for OL (Velazquez, Esquer, Munguía, & Moure-Eraso, 2011; Duarte, 2017; Zhang & Zhu, 2019). Hermelingmeier & von Wirth (2021) drew attention to the third quite promising perspective, in which OL and BS transformation are mutually reinforcing phenomena. In line with this perspective, Toma (2012) argued that the learning organization, to become a sustainable learning organization, must prove honest commitment toward sustainable development and consider the economic, social and environmental aspects of their activities holistically. This definition is identical to part of the definitions of sustainable business (e.g. Potocan & Mulej, 2007). The researchers presume that the concepts associated with OL are essential for forming BS. However, this area still has no accepted conceptual solutions (Hermelingmeier & von Wirth, 2021). There are also almost no empirical studies in the area; what has been developed are only single case studies, mostly exemplifying the elements and compounds of identified concepts (e.g. Molnar & Mulvihill, 2003; Müller & Siebenhüner, 2007; Battistella et al., 2021). Recently, the results of the first more general empirical studies have emerged, confirming the significance of the OL processes and the OL capability for BS. In particular, the cross-national empirical study by Zgrzywa-Ziemak & Walecka-Jankowska (2021) proved the significant influence of OL on BS (considered through the construct of sustainable performance [SP]).

### *2.2 Leadership and business sustainability*

Most researchers recognize leadership in the pursuit of sustainable development as necessary. Some of them even use distinct nomenclature – notably “sustainable leadership” (Lambert, 2011; Avery & Bergsteiner, 2011; Gerard, McMillan, & D’Annunzio-Green, 2017) or “sustainability leadership” (Galpin & Whittington, 2012; Bendell & Little, 2015). At the same time, however, the concept is understood very differently, often even in isolation from sustainable development issues. Moreover, works explicitly linking the concept to sustainable development are of varying nature. The development of the concept of sustainable leadership should be based on two theoretical pillars: BS and leadership theories and the relationship between them. Still, there is very little work to date on understanding the relationship between leadership and BS (Armani et al., 2020; Brandt, 2016; Iqbal, Ahmad, Nasim, & Khan, 2020).

Transformational leadership is essential for BS development (Brandt, 2016; Lozano, 2015; Tideman, Arts, & Zandee, 2013); there is also the first empirical evidence of the positive effect of transformational leadership on organizational sustainability capabilities (Amin, Hakimah, Madjir, & Noviantoro, 2019). Transformational leadership represents the visionary paradigm (Avery, 2004). On the other hand, there are arguments supporting the claim that it is organic leadership that drives sustainability (Avery & Bergsteiner, 2011; Suriyankietkaew, 2013). It is emphasized that – in the face of the problems of sustainable development – the classical leadership paradigms and the transactional paradigm (in which

the leader provides employees with a sense of certainty and security), and the visionary paradigm (satisfying the needs of identification), should be rejected as they impose a passive role on other participants in the organization (than a leader). As Kriger & Zhovtobryukh (2013) pointed out, the concept of the heroic leader no longer fits in a complex and rapidly changing world. Kopnina & Blewitt (2018) argued that leadership for a sustainable enterprise does not refer to heroic leaders at the top of the enterprise, although there are certainly examples of this. Instead, it refers to people operating at different levels of the organization demonstrating a genuine commitment to social and environmental issues.

Leadership is not understood here through the lens of the characteristics and behaviors of individuals (leaders) but rather as a phenomenon inherent simultaneously in many individuals. The multi-objectivity of leadership is supported in the literature; it is mentioned, for example, by Mehra, Smith, Dixon, & Robertson (2006), Bolden (2011), Kriger & Zhovtobryukh (2013). Avery & Bergsteiner (2011) advocated moving away from linking leadership to the hierarchical position and seeing it in terms of relationships – the interdependence between leaders and their followers. Similarly, Ospina & Foldy (2015) shifted attention from formal leaders and their influence on followers to the relational processes that constitute leadership within a group, organization or system. In this context, the leader-follower relationship is situated within a broader system of relationships and meaning-making, communicative and organizational processes that – at the same time – help define and establish the relationship (Ospina & Foldy, 2015). In the conceptualization of leadership, it becomes legitimate to move away from understanding it as a role to seeing it as a shared process of influence (Mayrowetz, 2008).

Metcalf & Bem (2013) proposed that the conceptualization of leadership for BS should be based on the theory of complex adaptive systems. This is well described by Uhl-Bien & Marion (2009), according to whom leadership is an emergent interactive dynamics. This complex game generates collective momentum for action and change when diverse agents in a network of relationships interact to produce new patterns of behavior or new ways of acting. Therefore, leadership characteristics are multi-level, process, contextual and interactive (Uhl-Bien & Marion, 2009, p. 631). Leadership is seen as a property of a group or network of interacting individuals (Spillane, 2006; Woods, Bennett, Harvey, & Wise, 2004); a property of a social system in which both “leaders” and “followers” participate in a leadership process within the “relationship of cooperation and reciprocity” (Thorpe et al., 2008 after Kempster, Higgs, & Wuerz, 2014). Thus, it is a state of being characterized by the ability to learn, to be open and to respond consciously to the challenges of the environment (Zgrzywa-Ziemak, 2019). This reduces the understanding of leadership to its distributed forms, which are now increasingly noted by researchers as a manifestation of more sustainable organizational practices that allow for the empowerment of enterprise participants, reduction of alienation and enhancement of democracy and participation (Western, 2008).

The literature review does not provide a clear conclusion on leadership enhancing BS [consider also Piwowar-Sulej & Iqbal (2023)]. The majority of researchers reject the classical and transactional leadership paradigms as impeding BS in the face of sustainability challenges; contrasting viewpoints relate to the visionary paradigm [e.g. Amin et al. (2019) and Lozano (2015) versus Kopnina & Blewitt (2018)]; more and more researchers are recognizing organic leadership as favorable to BS (e.g. Bendell et al., 2017). The relationship between the concept of leadership inherent in the organic paradigm and BS has not yet been empirically investigated. Therefore, in the paper, the relationship between DL (a type of organic leadership) and BS is to be investigated. The following hypothesis may be formulated with references to the above considerations:

*H1. Distributed leadership favors business sustainability.*

### 2.3 Leadership and organizational learning

Research on OL in terms of a common construct (*i.e.* the organization) identifies various factors that are important for OL, and the crucial role of leadership is emphasized (Berson et al., 2006; Garvin et al., 2019; Senge, 1990; Vera & Crossan, 2004). Do & Mai (2020) provided a systematic literature review of multiple leadership approaches that have been recognized as drivers of different conceptualizations of OL (in total, 57 articles published between 2002 and 2019 were analyzed). The analysis proves that multiple leadership styles have been identified to support processes, levels and capabilities of OL. Transformational leadership is a dominant style that has been linked to OL in different contexts. However, there is also research on transactional leadership, generic leadership, strategic leadership, instructional leadership, altruistic leadership and servant leadership. Still, it is vague which leadership style is the most substantial factor (Do & Mai, 2020).

Most research relates the leader-centric leadership models to OL, and almost no empirical studies have examined the complexity of the leadership mechanism that facilitates OL to date (Do & Mai, 2020; Tourish, 2019). Avery (2004) argued that the organic paradigm mobilizes creativity, learning and adaptation. It supports considering leadership as a specific transmission mechanism to ensure the sustainability of change through new forms of OL within an overall normative system (Senge, 1990; Gronn, 2002; Harris, 2012). The intensification of OL processes promotes a shift away from the division of employees into those who are busy absorbing uncertainty and those who satisfy the need for safety and certainty; those who define organizational problems and those who solve them; those who make decisions and those who carry them out (Zgrzywa-Ziemak, Walecka-Jankowska, & Czerw, 2017). De Geus (1988) pointed out, however, that significant learning in organizations is the learning of people who have the power to take action for enterprise learning; leadership initiatives stemming from knowledge and commitment, rather than position, are essential. Employees from all functions and at all levels in the organization are looking to partner with DL on issues they really care about and believe should be explored by the organization for the purpose of learning (Antal, Dierkes, Child, & Nonaka, 2001). This way of understanding leadership relates to the concepts DL, which is recognized as crucial for OL capability development (Zgrzywa-Ziemak, 2019). This study adopts the concept of DL as conducive to OL. Therefore, the following hypothesis may be formulated:

*H2.* Distributed leadership favors organizational learning.

### 2.4 Distributed leadership and the relationship between organizational learning and business sustainability

Up-to-date research demonstrates the importance of OL for BS (Zgrzywa-Ziemak & Walecka-Jankowska, 2021). The considerations in the paper support the conclusion that DL is a potentially important factor for both OL and BS. However, the literature review does not allow inferring the nature of the influence of DL on the relation between OL and BS. Due to the specificity of the concept of DL (organic leadership: multi-level, process, contextual and interactive), different conceptualizations of the role of DL for the OL–BS relationship emerge as potentially possible. Two theoretical frameworks of the relationship between DL, OL and BS have been formulated.

In the first framework (Model 1, see Figure 1), DL provides a favorable context for OL to positively affect BS, and therefore it moderates the OL–BS relationship. Hypothesis *H3* is developed:

*H3.* Distributed leadership positively affects the strength of the relationship between organizational learning and business sustainability.

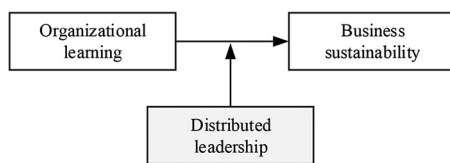
In the second framework (Model 2, see Figure 2), it is assumed that DL does not influence the relationship between OL and BS; it only affects both OL and BS positively (according to hypotheses *H1* and *H2*). The question then arises whether BS is influenced by DL only directly or indirectly through OL. Finally, the following hypothesis is developed:

- H4*. Organizational learning mediates the relationship between distributed leadership and business sustainability.

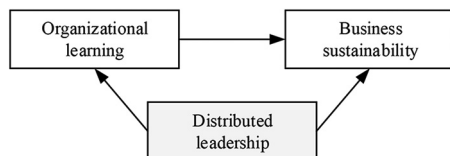
### 3. Empirical studies

#### 3.1 Research methodology

The research was carried out by means of the survey method. The survey was composed of questions measuring OL (5 dimensions, 42 items), DL (7 items) and BS framed as SP (3 dimensions, 15 items). Items from the questionnaire for all constructs are included in Appendix 5. The questionnaire was supplemented with questions about selected characteristics of the enterprise used to determine the sample structure. The respondents were asked to answer the questions of how they thought the enterprise was operating in reality and what actual results it achieved (rather than how it should operate or what results it should achieve). The sample that included diverse enterprises according to the specific characteristics of the enterprise and its environment was sought to study the identified relationships in the broadest possible context. The studies were conducted in the businesses functioning in two countries which differ in terms of sustainable development engagement: Denmark (consistently ranked among the top three countries in SDG Index, 2018–2022) and Poland (still outside the group of top-ranked countries, but steadily strengthening its position). The survey covered business organizations employing at least ten people, diversified by the type of activity. In each organization, one survey was completed (anonymously). The respondents were higher-level managers or people with a broad view of the entire enterprise, and their perceptions of the phenomena under study were surveyed. The studies were carried out at the turn of 2018 and 2019. In total, 694 businesses were examined: 391 in Poland and 303 in Denmark. Due to the purpose of the study, the sample was not representative, as the aim was to obtain numerically similar groups as far as their sizes are concerned (Table 1).



Source: Authors' own work



Source: Authors' own work

**Figure 1.** Model 1 as a conceptual framework of the relationship between DL, OL and BS

**Figure 2.** Model 2 as a conceptual framework of the relationship between DL, OL and BS

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The confirmatory factor analysis was used to test the measurement scales of all constructs. The moderated multiple regression (Model 1) and mediation analysis with a single mediator (Model 2) were used to verify the hypotheses. All primary analyses were performed by means of PS IMAGIO software using the Hayes process macro.

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### 3.2 The measurement of business sustainability

Concepts of BS refer to the organization's objectives – in relation to sustainable development goals (e.g. Dyllick & Muff, 2016), processes or activities which constitute BS (e.g. Salzmann et al., 2005), characteristics of a sustainable organization (e.g. Smith & Sharicz, 2011) and results – the contribution of organizations to sustainable development (e.g. Hart & Milstein, 2003). Zgrzywa-Ziemak & Walecka-Jankowska (2021) proposed a BS approach based on the SP construct adopted in the paper. It is worth emphasizing that research results show a strong correlation between the business's commitment and practices toward sustainability and its SP (Zgrzywa-Ziemak, 2019).

SP measurement scales are based on the organization's impact on social development, environmental protection and economic development. The basis for the formulation of the concept of SP was the analysis of the studies devoted to the theoretical foundations of measurement systems oriented toward sustainable development issues and those discussing the existing sustainability assessment methodologies (Chow & Chen, 2012; Elkington, 1998; GRI Report, 2013; Maletic, Maletic, Dahlgaard, Dahlgaard-Park, & Gomišček, 2015; Campos, De Melo Heizen, Verdinelli, & Cauchick, 2015). SP is a multidimensional construct that combines economic, environmental and social performance measured as follows (Tworek, Walecka-Jankowska, & Zgrzywa-Ziemak, 2019):

- *economic performance* (financial and nonfinancial aspects) includes the measurement of revenues, productivity, return on investment and the number of new products/services successfully implemented (Matić, 2012; Maletic et al., 2015);
- *environmental performance* relates to the environmental impact of the organization's activities, including emissions, wastewater and waste, consumption of hazardous, toxic, harmful materials, consumption of total resources (materials, energy, water) and the environmental impact of products/services sold and on biodiversity (Boiral & Henri, 2012; Maletic et al., 2015; Campos et al., 2015); and
- *social performance* measures the contribution to the creation of healthy and vibrant communities at the company and supply chain level: employee satisfaction, health and safety at work, customer satisfaction, quality (robustness, reliability, diligence), the organization's contribution to developing healthy and life-friendly communities in general, and the suppliers' compliance with social and environmental criteria (McKenzie, 2004; Vallance, Perkins, & Dixon, 2011; Crane, Palazzo, Spence, & Matten, 2014).

	Poland (n = 391)		Denmark (n = 303)		Total (n = 694)	
	number	[%]	number	[%]	number	[%]
Enterprise size (number of employees)						
Small enterprises (between 10 and 49)	126	32.2	67	22.1	193	27.8
Medium (between 50 and 249)	86	22.0	87	28.7	173	24.9
Large (between 250 and 1,000)	98	25.1	52	17.2	150	21.6
Very large (over 1,000)	73	18.7	82	27.1	155	22.3
Total	383	98.0	288	95.0	671	96.7

**Table 1.**  
The structure of the sample in terms of the employment size

**Source:** Authors' own work

Respondents were asked to rate SP in the last three years of operating on a five-point scale (from well below expectations to well above expectations with the middle point: as expected). The confirmatory factor analysis was used to test the SP scale. The measures of the overall fit indicate the fit of the structural model:  $X^2(87) = 301.02$ ,  $p < 0.001$ ,  $X^2/df = 3.46$ ,  $NFI = 0.911$ ,  $CFI = 0.935$ ,  $RMSEA = 0.06$ ,  $SRMR = 0.03$ . Harman's single-factor test revealed that the common method bias is not a significant issue in the study. Therefore, the SP variable and the variables measuring each of the dimensions of SP should be considered reliable (Cronbach's  $\alpha$  exceeds 0.7). Appendix 1 contains, among others, descriptive statistics and reliability coefficients for all variables building SP variables.

### 3.3 The measurement of organizational learning

OL is one of the core constructs in organizational theory. Easterby-Smith & Lyles (2011) indicated that the OL field has undergone dramatic changes and is constantly evolving. It is therefore important to address the most significant theoretical underpinnings regarding the nature and character of OL (Easterby-Smith & Lyles, 2011; Watkins & Kim, 2018; Zgrzywa-Ziemak & Walecka-Jankowska, 2021). OL is a continuous process because the changes in the organization and outside of it are continuous (Tsang, 1997) and it occurs under the influence of the interaction between the organization and its environment and as a result of internal aspirations (Cyert & March, 1963; Dodgson, 1993). The learning process covers information processing (e.g. Huber, 1991) and it occurs as a result of social interactions in the natural workplace (Cook & Yanow, 1993), thus OL has the cognitive and social perspectives (Easterby-Smith & Araujo, 1999). OL is performed by the concurrent processes of the verification of the existing knowledge and the development of the new one (i.e. by concurrent clashes of the exploitation and exploration processes), unlearning is part of learning here (Hedberg, 1981; Fiol & Lyles, 1985; de Holan & Phillips, 2011). The notion of the organizational knowledge is viewed as a complex phenomenon encompassing several levels distinguished with reference to the criterion of the difficulty of their change (Schein, 1992; Nonaka & Takeuchi, 1995; Dixon, 1997). OL proceeds among different levels: individual, group, organizational and inter-organizational levels and learning on different levels is of a different character (Argyris and Schön, 1996; Cangelosi & Dill, 1965; Crossan, Lane, & White, 1999). OL is inextricably linked to action (learning affects acting and vice versa), but the results of OL should be viewed more broadly – it might be a change not only of the behaviors of the organization but also of the potential behaviors (Tsang, 1997). Finally, OL is a discontinuous process and it is not a fully conscious process (Argyris and Schön, 1996). OL is susceptible to control and direction, however, it also evolves naturally (Shipton & Defillippi, 2011).

OL measurement scale developed by Zgrzywa-Ziemak (2019) is adopted. The scale measures *practices and organizational conditions* relating to the occurrence of OL processes on different organizational and inter-organizational levels. OL dimensions are measured as follows:

- *individual as an agent of OL*: the extent to which employees are learning agents involved in self-development and undertake bottom-up initiatives to improve the organization, and the organization supports agents' efforts in terms of both individual development initiatives and organizational improvement (based on: Friedman, 2001; Senge, 1990);
- *collective learning*: the extent to which intensive synergistic team-learning processes (of mutual knowledge verification and development) and synergistic collective-learning conditions (positive attitudes toward teamwork and relationships among employees oriented toward trust, openness, mutual respect and cooperation) are

present (based on: Kasl, Marsick, & Dechant, 1997; Senge, 1990; Dixon, 1997; Easterby-Smith & Araujo, 1999);

- *inter-organizational learning*: the extent to which a broad network of differentiated inter-organizational relations are developed by the organization (intense, oriented toward different learning modes, open and characterized by partnership, not by domination) (based on: Lane & Lubatkin, 1998; Inkpen & Tsang, 2005);
- *information system mobilizing development*: the extent to which IS leads to the use of various methods of information transfer, their parallel use, the minimal standardization of communication methods and message forms and IS mobilizes for action, which may be implemented, among other things, through feedback systems, early warning systems, reporting focused on the development goals, high IS reliability (based on: Huber, 1991; Pfeffer & Sutton, 2000; Nonaka & Takeuchi, 1995; Twarek et al., 2019); and
- *system thinking* (relating to coping with dynamic complexity): the extent to which the practices and tools to determine the systemic structures of organizational problems, identifying the interrelationships of decisions and actions in the short- and long-term perspective, locally and in the entire organization, the awareness of contribution to achieving organizational goals are implemented in the organization (Senge, 1990).

All 42 scale items were measured on a five-point Likert scale. The confirmatory factor analysis was used to test the OL scale. The measures of the overall fit indicate the fit of the structural model:  $X^2(70) = 46.317$ ,  $X^2/df = 4.632$ ,  $NFI = 0.979$ ,  $CFI = 0.983$ ,  $RMSEA = 0.072$ ,  $SRMR = 0.011$ . Harman's single-factor test revealed that the common method bias is not a significant issue in the study. Therefore, OL variable and the variables measuring each of the dimensions of OL should be considered reliable (Cronbach's  $\alpha$  exceeds 0.7). Appendix 1 contains descriptive statistics for the variable.

#### 3.4 The measurement of distributed leadership

DL is understood as "emergent property of a group or network of interacting individuals" working with "an openness of boundaries" and the "varieties of expertise are distributed across the many, not the few" (Bennett, Wise, Woods, & Harvey, 2003, p. 7). The theoretical concept of DL is developed based on the suggestions of: Gronn (2002), Woods et al. (2004), Spillane (2006), Mehra et al. (2006), Uhl-Bien, Marion, & McKelvey (2007), Uhl-Bien & Marion (2009) and Fitzsimons, James, & Denyer (2011). It is possible to identify distinctive features of the concept of DL. It is indicated that leadership is most importantly a property of groups of people, it is an emergent and fluid phenomenon, and it defines and is defined by the situation.

Based on the concept of DL, a measurement scale including seven items measuring five variables is proposed (Zgrzywa-Ziemak et al., 2017):

- *the transitivity of power*: the extent to which power in the organization depends more on the ongoing tasks and conditions of their implementation than on the hierarchical position (Gronn, 2002; Woods et al., 2004). This implies the interdependence of the participants in the leadership process rather than dependence on the leader and – at the same time – co-responsibility (Harris, 2012);
- *the supportive behavior of managers*: the extent to which managers create the conditions for taking power by the other employees of the organization, persons with adequate knowledge and/or ideas (Davison et al., 2013);

- *the willingness of employees to assume the power*: the extent to which the employees are ready to take over power; it relates to a sense of responsibility among employees resulting from their personal commitment to goals and a sense of duty to others (Zgrzywa-Ziemak et al., 2017);
- *the conjoint activity*: to what extent the participants in the organization contribute to the experience of synergy and the reciprocal influence. As the concept of DL, the leadership is primarily a property of a group of people (Gronn, 2002; Woods et al., 2004; Bolden, 2011); and
- *the atmosphere in superior-subordinate relations*: the extent to which the interpersonal relationships are dominated by mutual trust, openness and partnership (Metcalf & Benn, 2013).

All seven scale items were measured on a five-point Likert scale. The confirmatory factor analysis was used to test the DL scale. The measures of the overall fit indicate the fit of the structural model:  $\chi^2(13) = 46.09$ ,  $p < 0.001$ ,  $\chi^2/df = 3.545$ , NFI = 0.97, CFI = 0.978, RMSEA = 0.061, SRMR = 0.029. Harman's single-factor test revealed that the common method bias is not a significant issue in the study. Therefore, the DL variable should be considered reliable, as Cronbach's  $\alpha$  is 0.83 (Appendix 1 contains descriptive statistics for the variable).

### 3.5 Study results

The correlation analysis showed that all three variables are significantly correlated with one another ( $p < 0.01$ ), and SP is strongly correlated with both OL and DL. OL, on the other hand, is highly correlated with DL (cf., Appendix 2). However, understanding the nature of the relationship among the phenomena under study requires in-depth analyses. Therefore, to verify the hypotheses, two conceptual models were developed (Figure 1). Next, the results of the statistical analyses for Model 1 and Model 2 are presented.

**3.5.1 Model 1.** Moderated multiple regression was used to verify whether DL influences the strength of the relationship between OL and SP (so it is a moderator). Appendix 3 contains the analysis results for the total sample and divided according to the country where the enterprise operated.

The effect of OL on SP is positive and significant ( $b = 0.44$  s.e. = 0.0412,  $p < 0.001$ ), conditional on leadership = 0, the effect of DL is positive and significant ( $b = 0.1359$  s.e. = 0.0362,  $p < 0.001$ ), conditional on OL = 0. The interaction term is statistically significant and positive ( $b = 0.0602$  s.e. = 0.0236,  $p < 0.05$ ) in the model, indicating that leadership is a significant moderator of the effect of OL on SP. However, the R-square change due to the moderation effect is very low, 0.0052 [ $F(1,690) = 6.5226$ ;  $p < 0.05$ ], indicating that the interaction effect accounted for only 0.52% added variation in sustainable performance.

Moderated multiple regression was used to verify the hypothesis, divided in terms of the country where the enterprise operates. First, the Mann-Whitney  $U$  test was used to check whether the organizations from Poland and Denmark differ in terms of their OL, SP and DL (cf., Appendix 1). Danish organizations had significantly higher total OL ( $p < 0.01$ ) and achieved, on average, higher SP ( $p < 0.01$ ), while there are no significant differences in DL depending on the country. To verify the significance of the effect of the country on the relationships in Model 1, the moderated analysis was used (Models #2 and #3 in the Hayes process macro). Although it turned out that the country is not a statistically significant moderator, we present the results of moderated multiple regression divided in terms of the country, as it reveals how low the moderation effect in Model 1 is.

In the case of both countries, the effect of OL on SP is positive and significant ( $p < 0.001$ ), conditional on leadership = 0 (in Poland:  $b = 0.4002$  s.e. = 0.0549; in Denmark:  $b = 0.5116$

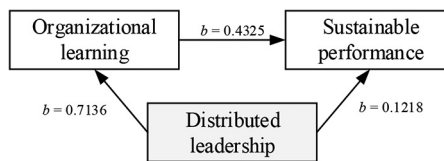
*s.e.* = 0.0645;  $p < 0.0001$ ). In Denmark, the effect of leadership is also positive and significant ( $b = 0.158$  *s.e.* = 0.0552,  $p < 0.01$ ), conditional on  $OL = 0$  and the interaction term is statistically significant and positive ( $b = 0.1362$  *s.e.* = 0.0422,  $p < 0.01$ ) in the model, indicating that, in Denmark, leadership is a significant moderator of the effect of OL on SP. The R-square change due to the moderation effect is 0.0179 [ $F(1,299) = 10.399$ ;  $p < 0.01$ ], indicating that the interaction effect accounted for 1.79% added variation in sustainable performance. The change of leadership into the more distributed one brings about the fact that the effect of OL on SP is higher. The more intensive OL processes are, the more important DL in obtaining higher, more sustainable results. However, in Poland, the conditional effect of leadership, conditional on  $OL = 0$  and the interaction term are statistically insignificant ( $p > 0.05$ ). More essentially, because of the hypothesis put forward, this result indicates that leadership is not a significant moderator of the effect of OL on SP.

In summary, hypotheses *H1* and *H2* that DL positively affects OL and BS are accepted. However, hypothesis *H3* that a change in leadership toward more distributed influences the strength of the relationship between OL and BS (so it is a moderator), should be rejected.

**3.5.2 Model 2.** Mediation analysis was used to verify whether DL positively affects OL and SP, and whether OL mediates the relationship between DL and SP. The regression results and analysis results are included in [Appendix 4](#).

The study revealed a significant positive effect of DL on OL ( $b = 0.7136$ ,  $t = 37.5543$ ,  $p < 0.001$ ). The R-square is 0.67 [ $F(1,692) = 1410.324$ ;  $p < 0.001$ ], indicating that 67% variation in OL is related to DL. According to the total effect model, DL has a significant positive impact on SP [ $F(1,692) = 376.0056$ ;  $p < 0.001$ ], and 35% change of SP is due to DL (the R-square is 0.35). There is a significant direct effect of DL on SP in the presence of the mediator ( $b = 0.1218$ ,  $t = 3.3856$ ,  $p < 0.001$ ) and a significant indirect effect of DL on SP ( $b = 0.4304$ ,  $p < 0.05$ ) with the mediating role of OL. It should be noticed that OL has a significant, positive impact on SP ( $b = 0.4325$ ,  $t = 10.4781$ ,  $p < 0.001$ ). [Figure 3](#) presents the final model.

The study assessed the mediating role of OL on the relationship between DL and SP. This is a partial and complimentary mediation – DL affects SP directly and indirectly through OL. The mediation analysis summary is included in [Table 2](#).



Source: Authors' own work

**Figure 3.** Model 2: regression results for DL and SP relationship, OL as a mediator ( $p < 0.001$ )

**Table 2.** Mediation analysis summary for relationship: DL → OL → SP ( $n = 694$ )

Total effect	Direct effect	Indirect effect	Confidence interval		Conclusion
			Lower bound	Upper bound	
0.4304 ( $p < 0.001$ )	0.1218 ( $p < 0.001$ )	0.3086	0.2473	0.3716	Partial and complementary mediation

Source: Authors' own work

All effects in Model 2 specific to the total sample appeared to be analogous for samples of companies operating in Denmark and Poland. The effects of the country variable on the relationship between DL and OL and the relationship among OL, DL and SP are statistically insignificant (it does not influence the strength of these relationships). To verify the significance of the country variable in Model 2, the moderated mediation analysis was performed (model #59 in the Hayes process macro).

To sum up, hypotheses *H1*, *H2* and *H4* are accepted: DL affects both OL and SP, and OL mediates the relationship between DL and SP. Model 2 appeared to characterize the relationship between DL, OL and SP appropriately. DL emerges as a significant factor influencing positively OL and BS. At the same time, the positive effect of DL on BS is greater, the more intense OL processes are.

#### 4. Discussion

There is an ongoing discussion in the literature on the relationship between OL and BS. On the one hand, OL is indicated as an essential condition for the formation of BS whereas, on the other hand, it is BS that is indicated as the direction and catalyst of OL. Additionally, it is increasingly recognized that these are strongly interdependent phenomena, interacting with each other (Brandi, Collin, & Lemmetty, 2022). Although there is no well-established theory of the relationship between OL and BS yet, there are attempts at its empirical verification, carried out mainly in the first theoretical strand. In this paper, to break the barrier of no conceptual framework for the relationship between OL and BS, the authors assume that BS will refer to the organizational results understood in an integrated way (as economic-environmental-social). Thus, the analyses conducted were included in the strand of research on the relationship between OL and organizational performance (Goh *et al.*, 2012; Zgrzywa-Ziemak, 2015; Watkins & Kim, 2018), but are an extension of it toward SP (Zgrzywa-Ziemak & Walecka-Jankowska, 2021).

However, the purpose of the research was broader. It pertained to the OL–BS relationship. This article is one of the first studies that present the relationship between OL and BS with reference to internal and external factors impacting BS. Based on an analysis of the literature, research was undertaken into one of the potentially important determinants of this relationship, *i.e.* leadership (Wu & Ma, 2017). Leadership is the element that appears to be important for implementing BS, because commitment to BS is largely driven by sharing values. Thus, the article is the voice in the discussion of sustainable leadership, which requires understanding the theoretical relationships between different types of leadership and BS (Piwowar-Sulej & Iqbal, 2023). It addresses the theoretical foundations – tying the leadership inherent in the organic paradigm to BS, simultaneously verifying the direct and indirect impact of DL on BS empirically. The conceptualization of DL has led to a shift from a focus on the heroic leader to a concept of leadership as an adaptive process, fostering a systemic perception of reality and the involvement of competent employees in decision-making, thanks to their willingness to take responsibility and the managers' willingness to share power. The relationship between employees and managers should be based on mutual trust, commitment, freedom and partnership. Therefore, the concept of DL is appropriate in highly uncertain, dynamically complex conditions. In the light of literature research, such leadership is – at the same time – an essential condition for intensifying OL processes (Senge, 1990).

The empirical research was based on two theoretical frameworks of the relationship among DL, OL and SP, and the result is not unequivocal. The first of the proposed models (where DL plays the role of the moderator of the OL and BS relationship) does not describe reality well (so hypothesis *H3* was rejected). In more detail, it can be noted that, on the one

hand, the correlation analysis indicates a high correlation between leadership understood in this way and both OL and SP. Leadership also turned out to be a significant but weak moderator of the OL and SP relationships in the whole sample of enterprises under study, a significant and more important moderator in the group of enterprises operating in Denmark and statistically not significant in the group of enterprises operating in Poland. We find such a result as opening a wide field for discussion. First, research in the Danish sample showed that the importance of leadership in moderating the effect of OL on SP increases as OL sophistication increases. This means that among companies with a lower level of OL, the impact of leadership is lower and, in those companies where OL is higher, this impact will be higher. As OL in Poland is significantly lower than in Denmark, it is possible that leadership moderation may become significant only after a certain level of OL intensification is reached. Moreover, it seems likely that leadership is of particular importance in relation to selected OL dimensions – those based on social elements and relationships. Although the statistical analysis showed that there is a significantly lower level of the total OL variable in the Polish sample (compared to the Danish sample), further verification proves that there is a significantly lower level of the involvement of companies operating in Poland in relation to three OL dimensions: collective learning, individual as an agent of OL and inter-OL. In the context of these dimensions, DL emerges as crucial, favoring the involvement of all employees in learning and putting forward bottom-up improvement initiatives at the individual and group levels, freely establishing intra- and inter-organizational relations. Regarding the other two dimensions, systems thinking and information system mobilizing development, which are harder, more technical and less related to social elements and relationships, leadership should have less importance according to the definition formulated in the article. In the sample, these two OL dimensions did not differ significantly by country.

The second model proved to be a good fit for the data. Statistical analysis revealed an indirect and direct relationships between DL and SP. Furthermore, it turned out that OL plays a mediating role in the relationship between DL and SP in both countries (partial and complementary mediation), with slightly stronger results for companies operating in Denmark. Thus, the intensification of OL processes allows for increasing the indirect impact of DL on SP. This seems to be because intensifying OL processes promotes a shift away from the division between decision-making employees defining organizational problems and solving them. Thus, it fosters that employees occupying different positions in the organization engage in joint learning of what, from their perspective, is relevant to the operation of the organization, leading to increased BS.

The concept of sustainable leadership requires not only an understanding of the theoretical and empirical links between different types of leadership and BS but also needs to be set in a broader context. Mechanisms that not only give direction to organizational activities but also integrate them to achieve sustainability goals also seem to be important. Moreover, it seems that such moderators or mediators of the relationship between leadership and BS can be a shared vision, core values and organizational strategy. This is indicated by the work of [Metcalf & Benn \(2013\)](#) and [Epstein & Buhovac \(2014\)](#), among others, who highlight the unique role of top leadership in shaping the vision, values and strategy in embedding sustainability in the organization's operations. Embedding sustainability in those elements of the organization that remain constant over the long term (such as vision and values) seems to be crucial for long-term efforts to achieve sustainability goals. At the same time, it can be assumed that the involvement of employees in activities related to achieving sustainable goals also requires measurement systems, specific methods and management tools (e.g. sustainability balance scorecard, environmental and social responsibility management systems, life cycle management, integrated reporting tools).

Metcalf & Benn (2013) highlighted that leadership for BS requires less consideration of the moral aspect of decision-making and more of complex problem-solving. However, BS requires recognizing multiple obligations to society today and future generations, which requires being guided by specific values. Avery & Bergsteiner (2011) and Gerard et al. (2017) emphasized that a new leadership theory is needed to contribute to the participation of businesses in sustainable development, with social and environmental responsibility at its core. This raises the question of whether defining “sustainable leadership” is indispensable. If we were to do so, an incredibly apt one would be the one offered by Bendell et al. (2017, p. 434), according to which leadership is “sustainable leadership is any ethical behavior that has the intention and effect of helping groups of people address shared dilemmas (economic, environmental, social and cultural) in significant ways not otherwise achieved”. At the same time, however, it seems more appropriate to identify specific characteristics of leadership that support or impede BS. On the one hand, these characteristics refer to its collective nature and numerous determinants: the attitudes, behaviors and roles of managers and the characteristics of participants in the leadership process and the relationship between those participants and managers. On the other hand, what is important is the basis for integrating the leadership processes in the context of the challenges of BS (i.e. referring to economic-social-environmental issues and temporal and spatial orientation). This integration results from the characteristics of individuals and the ways of participating in sustainable development by an enterprise.

## 5. Conclusions

The paper explores the significance of DL in shaping the relationship between OL and BS. To date, no research has systematically explored the role of leadership in the OL–BS nexus. Therefore, this article conducts an in-depth literature review independently examining the relationships between leadership and BS, as well as leadership and OL. The findings from the literature review expose that the theoretical foundation of the leadership-BS relationship is very limited and hardly empirically verified. The analysis of the literature discussion reveals a diverse range of theoretical indications pertaining to the two focal relationships (leadership-BS and leadership-OL), which draw upon distinct leadership paradigms. In light of the distinctive challenges posed by sustainability, this study aligns with researchers who underscore the significance of the organic paradigm, opting for DL in further investigations. This paper formulates two alternative models outlining the impact of DL on the OL–BS relationship and validates them through extensive empirical cross-country research. The results from the empirical study unveil that DL stands as a significant factor positively influencing both OL and BS. Concurrently, the positive impact of DL on BS becomes more pronounced as OL processes intensify. These results not only enhance our comprehension of the dynamics between DL, OL and BS but also open new avenues for sustainable leadership research. This deeper understanding sheds light on the intricate relationships between different leadership types and BS.

It is essential to underline that the research presented above has some limitations. First, model verification is based only on two samples (from Poland and Denmark). Second, the research sample was not representative. However, this was due to conscious assumptions as it was assumed that it was crucial to obtain a sample of organizations with the characteristics which would allow a complete understanding of the nature of the relationship under consideration. Therefore, efforts were made to ensure that the number of groups of organizations of different sizes was similar for both countries. Furthermore, further research could attempt to test continuity to see changes in OL and SP (this study represents a snapshot in time). Moreover, the hypotheses require further verification in

different business contexts – i.e. considering other (internal and external) factors that impact organizational performance and BS, as emerges from the literature review. In addition, the conclusion referring to the differences between countries (cultural or technological advancement and resources) is undoubtedly an attention-grabbing direction for future research. Finally, it would be essential to relate OL processes to BS understood from the process perspective and not from the organizational performance perspective.

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**Table A1.**  
Mann–Whitney  
*U* test statistics  
verifying the  
significance of  
differences in SP, OL  
and DL in Polish and  
Danish companies

Variable	Cronbach's $\alpha$	Poland ( $n = 391$ )			Denmark ( $n = 303$ )			Total ( $n = 694$ )			Mann–Whitney <i>U</i> test	
		<i>M</i>	<i>ME</i>	<i>SD</i>	<i>M</i>	<i>ME</i>	<i>SD</i>	<i>M</i>	<i>ME</i>	<i>SD</i>	<i>Z</i>	<i>p</i>
<i>Sustainable performance</i>	0.78	3.44	3.41	0.51	3.52	3.49	0.50	3.47	3.44	0.51	-2.097	0.036
Economic performance	0.74	3.40	3.43	0.57	3.45	3.43	0.55	3.42	3.43	0.56	-1.070	0.285
Environmental performance	0.80	3.41	3.20	0.60	3.53	3.60	0.61	3.46	3.40	0.61	-2.897	< 0.01
Social performance	0.79	3.51	3.60	0.70	3.57	3.60	0.62	3.54	3.60	0.67	-1.009	0.313
<i>Organizational learning</i>	0.91	3.35	3.39	0.66	3.53	3.51	0.54	3.42	3.45	0.61	-3.330	< 0.01
Individual as an agent of OL	0.84	3.38	3.50	0.79	3.64	3.63	0.64	3.50	3.50	0.74	-4.334	< 0.01
Collective learning	0.90	3.54	3.67	0.82	3.79	3.89	0.65	3.65	3.78	0.76	-3.759	< 0.01
Inter-organizational learning	0.85	3.32	3.33	0.72	3.55	3.56	0.68	3.43	3.44	0.71	-4.305	< 0.01
Is mobilizing development	0.88	3.60	3.70	0.73	3.60	3.60	0.65	3.60	3.65	0.70	-0.240	0.810
System thinking	0.84	3.46	3.50	0.81	3.57	3.50	0.68	3.51	3.50	0.76	-1.673	0.094
<i>Distributed leadership</i>	0.83	3.56	3.71	0.76	3.62	3.71	0.63	3.58	3.71	0.70	-0.544	0.586

**Notes:** *M* = mean; *ME* = median; *SD* = standard deviation; *Z* = Mann–Whitney *U* test; *p* = significance level  
**Source:** Authors' own work

	Poland (n = 391)			Denmark (n = 303)			Total (n = 694)		
	OL	SP	DL	OL	SP	DL	OL	SP	DL
Organizational learning (OL)	1	0.616**	0.795**	1	0.677**	0.772**	1	0.642**	0.780**
Sustainable performance (SP)	0.616**	1	0.542**	0.677**	1	0.602**	0.642**	1	0.564**
Distributed leadership (DL)	0.795**	0.542**	1	0.772**	0.602**	1	0.780**	0.564**	1

**Note:** \*\*Correlation is significant at the 0.01 level  
**Source:** Authors' own work

**Table A2.**  
 Model 2: variables correlations

**Table A3.**  
Regression results  
for OL and SP  
relationship –  
leadership as a  
moderator (total  
sample, Polish and  
Danish samples)

Model	Variable	Coeff.	SE	t-statistic	p-value	R	Adj. R <sup>2</sup>	MSE	F-statistic	p-value	Delta R <sup>2</sup>	F-statistic	p-value
Total (n = 694)	Constant	3.4513	0.0167	206.9688	0.0000	0.6679	0.4461	0.1449	185.2616	0.0000	0.0052	6.5226	0.0109
	OL	0.44	0.0412	10.675	0.0000								
	DL	0.1359	0.0362	3.7498	0.0002								
Poland (n = 391)	Int: OL*DL	0.0602	0.0236	2.5539	0.0109								
	Constant	3.4315	0.0233	147.3178	0.0000	0.6526	0.4259	0.1529	95.6884	0.0000	0.0003	0.2296	0.6321
	OL	0.4002	0.0549	7.2924	0.0000								
Denmark (n = 303)	DL	0.1155	0.0486	2.3774	0.0179								
	Int: OL*DL	0.0143	0.0298	0.4792	0.6321								
	Constant	3.4812	0.0237	146.6458	0.0000	0.6959	0.4843	0.1317	93.587	0.0000	0.0179	10.399	0.0014
	OL	0.5116	0.0645	7.9297	0.0000								
	DL	0.158	0.0552	2.8642	0.0045								
	Int: OL*DL	0.1362	0.0422	3.2247	0.0014								

**Notes:** OL = organizational learning; SP = sustainable performance; DL = distributed leadership  
**Source:** Authors' own work

Output variable	Variable	Coeff.	SE	t-statistic	p-value	R	Adj. R <sup>2</sup>	MSE	F-statistic	p-value
OL	Constant	0.8658	0.0694	12.471	0.0000	0.819	0.6708	0.1239	1410.324	0.0000
	DL	0.7136	0.019	37.5543	0.0000					
SP	Constant	1.5551	0.0834	18.6414	0.0000	0.664	0.4409	0.1461	272.4536	0.0000
	DL	0.1218	0.036	3.3856	0.0008					
SP	OL	0.4325	0.0413	10.4781	0.0000	0.5933	0.3521	0.169	376.0056	0.0000
	Constant	1.9295	0.0811	23.7953	0.0000					
	DL	0.4304	0.0222	19.3909	0.0000					

**Notes:** OL = organizational learning; SP = sustainable performance; DL = distributed leadership  
**Source:** Authors' own work

**Table A4.** Regression results for DL and SP relationship – OL as a mediator (*n* 694)

**Table A5.**  
Questionnaire items  
for all constructs:  
organizational  
learning, sustainable  
performance,  
distributed  
leadership

Construct	Dimensions	Items
Organizational learning	Individual as an agent of OL	Employees who are more experienced are trainers and advisers to those who have less experienced
		Workers spend time reflecting on everyday activities, solutions, mistakes and/or successes
Collective learning		The company uses a change of job positions to extend the skills of employees
		An individual development plan is created for each employee in the company
		Employees in our company are people with high aspirations
		Employees at all levels are committed to improving the processes and/or products of the company
		Employees systematically participate in formally organized training
		Career plans for employees consider their individual needs and aspirations
		Teamwork is appreciated as a way to accomplish complex tasks
		Teamwork is valued as a way of doing things that can lead to breakthrough ideas
		A great emphasis in teams/groups is put on mutual learning
		Employees take an active part in defining the common goals of the team (or another organizational unit)
Inter-organizational learning		Teamwork is appreciated as a way to build new solutions (changes in products/processes)
		Employees actively seek knowledge and information outside their team (or another organizational unit)
		Progress, results and errors are systematically jointly analyzed and discussed
		Inter-functional teams (gathering employees from various departments) are often established in the company
		Mutual trust dominates between employees
		Employees from partner companies cooperate in joint projects
		The flow of information between partner companies is intense
		Intensive cooperation with clients is carried out
		The company cooperates with universities, research institutes and non-governmental organizations
		The company's relations with the co-operators are characterized by partnership and not by domination or coercion
Sustainable performance		The company uses the services of other organizations to develop its own technology or specific products (e.g. hiring a laboratory to test the strength of a new product)
		The company enters into cooperation with other organizations to gain access to resources or competences that it does not have and intends to develop (e.g. imitation of solutions developed by others; purchase of new technology)
		The company cooperates with other organizations to develop new technologies and/or products with them (establishing cooperation allows for sharing risk, costs and/or combining competences)
Distributed leadership		Mutual trust dominates in relations with business partners

(continued)

Construct	Dimensions	Items
Distributed leadership	System thinking	<p>The employees have a sense of responsibility for the company's results</p> <p>The middle- and top-level managers ensure that individual units do not achieve their results at the expense of other parts of the company</p> <p>Managers examine in detail the effects of their decisions not only in the short-but also in the long term</p> <p>Managers examine in detail whether and what the consequences of their decisions (not only locally but also in other parts of the company) are</p> <p>The company uses modeling and/or simulations as support for decision-making</p> <p>The quality of decisions is assessed</p> <p>Information flow on the supervisor-subordinate line is very intense and mutual</p> <p>Organizational problems are freely discussed by employees from various positions and departments</p> <p>Employees willingly use any IT tools available in the company (messengers, information systems such as ERP and databases)</p> <p>The company extensively use early warning systems (which are designed to monitor internal processes and the environment)</p> <p>The company's reporting concerns not only financial matters but also the implementation of development goals</p> <p>Employees quickly receive feedback about the results of their work</p> <p>The usability of information systems used in the organization is high</p> <p>The reliability of information systems used in the organization is high</p> <p>The reliability of information included in information systems used in the organization is high</p> <p>The reliability of support services available for information systems used in the organization is high</p> <p>The actual power in the enterprise depends primarily on the type of task and conditions of its implementation and not on the position held</p> <p>Relationships between the superior and the subordinate are dominated by partnership, openness and mutual trust (not dominance, secretiveness and distrust)</p> <p>Managers act as mentors, advisors and/or intellectual partners to their subordinates</p>
	Transitivity of power	Employees are ready to make their own decisions
	Supportive behavior of managers	In the company, pro-group activities are predominant, manifested by, among other things, orientation toward others, mutual help, interest in other people and involvement in group activities
	Atmosphere in the superior-subordinate relations	
	Willingness of employees to assume the power	
	Conjoint activity	

(continued)

Table A5.

**Table A5.**

Construct	Dimensions	Items
Sustainable performance	Economic performance	A compromising and cooperative orientation predominates in the organization; the tendency toward confrontation, when justified, is adopted
		A sense of common purpose prevails in the organization
	Environmental performance	Revenues
		Productivity (low costs)
		Return on investment (ROI)
	Social performance	New products or services successfully launched
		Emissions, effluent and waste
		Consumption of hazardous/harmful/toxic materials
		Resources use (key materials/energy/water)
		Impacts on biodiversity
		Employees' satisfaction
		Health and safety occupational conditions
		Customer satisfaction
		Quality (reliability, diligence)
		Participation in the development of healthy and livable communities
		Fulfillment of social and environmental criteria by the company's suppliers

**Source:** Authors' own work