

# Supervisor idea adoption scale

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# Supervisor Idea Adoption Scale: Construction, Reliability, and Initial Validity Evidence

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Despite the importance of workplace innovation, the adoption of creative ideas at workplace level has received little attention due to a lack of measures for idea adoption. The purpose of this study was to develop and validate a scale that measures employees' perceptions of the process of idea adoption. Specifically, the scale assesses employee perceptions of their supervisor's behavior in terms of idea openness, selection and application. Three studies were conducted to develop the supervisor idea adoption scale and investigate the scale scores' psychometric properties (Study 1,  $n = 326$ ); concurrent, convergent and divergent validity (Study 2,  $n = 333$ ); and test–retest reliability over a three month period (Study 3,  $n = 189$ ). The findings indicated good psychometric properties: the 3-factor structure was supported, and the scales scores showed internal consistency and retest reliability. Furthermore, the scale scores' associations with other variables provided initial evidence for concurrent, convergent and divergent validity. Several recommendations are made for the application of the scale in research and practice.

**Keywords:** supervisor idea adoption, workplace innovation, idea generation, leaders

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Workplace innovation is considered crucial for organizational performance and long-term survival within a dynamic business environment (Agars, Kaufman, & Locke, 2008; Anderson, Potočnik, & Zhou, 2014; Hammond, Neff, Farr, Schwall, & Zhao, 2011). Economic and technological progress depends on creative ideas that develop into new procedures, products and services (Amabile, 1996; Oldham & Cummings, 1996; Shalley, Zhou, & Oldham, 2004). In daily practice of regular, noninnovation departments, workplace innovation pertains to incremental improvements in procedures, processes, products and policies. Workplace innovation involves both idea generation and idea implementation (Rank, Pace, & Frese, 2004). Given the relevance of workplace innovation for organizations' competitive advantage, researchers have devoted considerable attention to individual and organizational factors that may stimulate or hinder idea generation and implementation (Anderson et al., 2014; Hammond et al., 2011).

Less research attention has been given to the link between these two phases, that is, the adoption of an employee's creative idea and its application within the work environment. Innovative ideas that are generated by individual employees are not necessarily implemented in the workplace (Baer, 2012). In order to be implemented, an idea first needs to be adopted for implementation. *Idea adoption* is the bridge between the first phase of innovation, idea generation, and the second phase, idea implementation. It refers to a process of being open to an employees' idea, selecting this idea, and converting this idea into workplace practices.

Using predominantly experimental designs, some research has focused on the role of idea evaluation (e.g., Mumford, Lonergan, & Scott, 2002) and idea selection (Rietzschel, Nijstad, & Stroebe, 2010) as predictors of idea implementation. Yet, the process of idea adoption within an individual employee's work setting has been underresearched. Moreover, there is a lack of valid measures that assess employees' perceptions of the process of idea adoption. Insights into employees' perceptions about the idea adoption process would provide researchers with a more nuanced understanding of workplace innovation, especially in noninnovation department settings. Furthermore, these insights may help managers to assess why creative ideas fail to be implemented (Baer, 2012).

The purpose of the work presented here was to develop and validate a scale that measures employees' perceptions about the process of idea adoption. Specifically, the scale assesses employees' perceptions of their supervisor's behavior in terms of the openness to, and selection and application of the employee's creative ideas. In the literature, supervisory leaders are thought to be one of the most influential predictors of workplace innovation

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as they provide a context for employees' creativity and innovative behavior (Rosing, Frese, & Bausch, 2011; Sijblom, Janssen, & Van Yperen, 2015; Tierney, 2008; Volmer, Spurk, & Niessen, 2012). Moreover, leaders can be considered key players in the process of idea adoption. As an essential link between the work floor and strategic management (Balogun & Johnson, 2004), they have the power and responsibility to decide which idea will be adopted for work place innovation (Lenaerts, Caniëls, Van Dam, & De Stobbeleir, 2015).

### Workplace Innovation: The Role of Supervisor Idea Adoption

Innovation in any organization is vital to its successful performance (Anderson et al., 2014). Innovation can happen at different organizational levels; besides a transformation of the entire organization, *innovation* can refer to the development of individual work roles and the implementation of new ideas at the work floor, in teams and departments (Anderson & King, 1993). The focus of this study is on the latter, workplace level. Specifically, we concentrate on regular work settings, as opposed to innovation departments in which employees usually have an explicit job requirement to be creative and generate ideas. Our objective is to assess the extent to which ideas brought forward by employees in regular work settings are adopted in their organizations as perceived by the employee. These ideas may be mostly incremental in nature and concern for instance ideas for new procedures or practices within the direct work environment.

Nowadays, most researchers embrace a process approach to workplace innovation that encompasses two components, idea generation and idea implementation (Amabile, 1988; Anderson et al., 2014; Rank et al., 2004). Whereas these two components were initially studied in separate fields, they are nowadays considered two crucial aspects of innovation processes that alternate throughout the innovation process in an ever-changing manner (Rosing et al., 2011).

The generation of novel and useful ideas has been traditionally conceptualized as an output variable, that is, creative performance (Shalley et al., 2004; Unsworth & Clegg, 2010). Idea generation is most evident in the beginning of the innovation process (De Jong & Den Hartog, 2010) when problems or performance gaps are recognized and ideas are generated in response to a perceived need for innovation (West, 2002). Although idea generation is often associated with the production of ideas with absolute, true novelty, it is also possible that employees propose ideas that are relatively novel for the organization or workplace, but are already used in other settings and organizations (Rank et al., 2004). Studies on idea generation generally focus on how ideas are generated and on the personal and organizational characteristics that stimulate idea generation (Reiter-Palmon & Illies, 2004; Shalley et al., 2004). The purpose of these studies is to find ways in which the generation of creative ideas can be maximized.

*Idea implementation* refers to the process of converting creative ideas into new and improved products, services, or ways of doing things such that they are beneficial to the relevant unit of adoption (Baer, 2012; West, 2002). Given the increased dynamics in the business environment, employees' innovative behavior has gained in importance, and researchers have focused on the factors that

affect innovation and innovative behavior at different levels (Anderson et al., 2014; Hammond et al., 2011).

It is often assumed that the mere generation of creative ideas will translate in successful implementation of these ideas. However, generating a pool of creative ideas does not necessarily imply effective implementation of these ideas into daily work practices (Baer, 2012). Although idea generation is considered to involve mainly intraindividual cognitive processes, idea implementation is largely the result of interindividual, social-political processes (Anderson et al., 2014; Rank et al., 2004; Yuan & Woodman, 2010). For instance, creative and novel ideas often imply uncertainty and risk (Mueller, Melwani, & Goncalo, 2012). As such, they may evoke skepticism and resistance especially when they pose a threat to the status, expertise and relationships that have been acquired over time (Janssen, Van de Vliert, & West, 2004). As a consequence, leaders may not be open to their subordinates' ideas and refuse to adopt these ideas (Sijblom et al., 2015). One's standing in the social-political network and the relationship with the supervising leader may impact whether one's ideas will be selected and implemented (Baer, 2012). To avoid rejection, some employees might not be motivated to develop and suggest new ideas (Baer, 2012); others may perceive that their ideas will not be converted into workplace practices anyhow. As a result of these social factors, the innovative ideas that are generated by individual employees do not necessarily have to be implemented in the workplace.

An important condition for idea implementation is *idea adoption*, which refers to the process of being open to an employee's idea, selecting this idea and converting this idea into workplace practices. Idea adoption provides the bridge between the first phase of innovation, idea generation, and the second phase, idea implementation. Only recently, researchers have started to investigate the gap between idea generation and idea implementation. Some research has focused on idea evaluation, which is generally conceived of as an internal cognitive activity that involves the assessment of an idea against a benchmark or standard (Mumford et al., 2002). Findings suggest that idea evaluation depends not only on the idea itself but also on individual and contextual factors (Herman & Reiter-Palmon, 2011; Sullivan & Ford, 2005). Similarly, idea selection has become a topic of research (De Buissonjé, Ritter, De Bruin, Ter Horst, & Meeldijk, 2017; Rietzschel et al., 2010, 2014; Zhu, Ritter, Müller, & Dijksterhuis, 2017). Several studies have focused on the characteristics of the ideas that are selected, showing that people prefer useful ideas over creative ideas (Rietzschel et al., 2010) and that instructions (Rietzschel, Nijstad, & Stroebe, 2014) and an intuitive mode of decision making (Zhu et al., 2017) can improve the quality of idea selection.

Although these studies of idea evaluation and idea selection provide valuable information on the idea generation-implementation gap, this information is still limited, however. Most studies use experimental designs to investigate how research participants evaluate and select ideas on their merits (Herman & Reiter-Palmon, 2011; Hunter, Friedrich, Bedell, & Mumford, 2006; Mueller et al., 2012), but they do not study the actual selection and adoption of ideas in the work environment. Although some studies investigate interpersonal idea evaluation and selection, and how one's role as the idea generation source (or not) affects evaluation and selection outcomes (Berg, 2016; Runco & Smith, 1992), most research concentrates on situations where the evaluation and selection of

ideas is done by the same people who generated the ideas (De Buissonjé et al., 2017; Rietzschel et al., 2010, 2014). This contrasts with the workplace, where it is usually the supervisory leader who decides which ideas are adopted for implementation. Especially in workplace innovation, the leader serves as the change agent who is responsible for implementing the organization's strategy through adopting employees' innovative ideas. Moreover, supervisors have to justify resource allocation within their department and explain performance toward top management (Rank, Nelson, Allen, & Xu, 2009; Škerlavaj, Černe, & Dysvik, 2014). As idea adoption often requires human and financial resources, supervisors have a decisive voice in the choice of ideas that will be adopted for further development and implementation (Škerlavaj et al., 2014).

### The Present Study

The aim of this study is to develop and validate a scale for supervisor idea adoption that measures employees' perception of the extent to which their ideas are being adopted and applied within their work environment. Using a process approach and emphasizing the role of the supervisory leader, we propose three phases in the idea adoption process. Idea adoption starts with idea openness, where the supervisor is open to the employee's ideas, pays attention to these ideas and discusses them with the employee. Next is the phase of idea selection, where the supervisor accepts the idea and chooses it for implementation. The proof of idea adoption lies in idea application, where the ideas of the employee are converted into the daily work practices of the team or department.

Three studies were conducted to develop and validate a measure for perceived supervisor idea adoption and to establish the scale scores' (a) factor structure (Studies 1 and 2), (b) associations with constructs within the nomological network (Study 2), (c) test-retest reliability over a three month period (Study 3), and (d) internal consistency (Study 1 through 3).

#### Study 1: Scale Development and Initial Validation of the Factor Structure

The focus of this study was to develop a measure for employee perceptions of their supervisors' idea adoption, which would include three aspects: (1) supervisors' openness to employees' ideas, (2) supervisors' selection of employees' ideas, and (3) the application of these ideas in the daily work situation. Lengthy scales can cause practical problems in research and field settings because of timely dropouts and concerns of overburdening respondents. Therefore, the ultimate goal was to develop a parsimonious scale with a small number (3 to 4) of items per aspect that would still adequately capture the construct of interest.

#### Method

**Participants and procedure.** Participants were employees of a Dutch municipality in the south of the Netherlands. Because of changed legislation, municipalities have recently taken over a number of tasks from the Dutch government, such as youth care, work and income, and care for the long-term sick and elderly. These extra tasks have emphasized the need for efficiency and knowledge development. At the same time, technological devel-

opments and, in particular, increased IT usage has put municipalities under pressure to innovate.

Prior to data collection, the purpose and conditions of the study were extensively discussed with the responsible alderman, general director and several interest groups such as the work council. Approval was also obtained from the ethical committee of the research institute that conducted the study, implying that research participants were treated in accordance with the ethical guidelines set out by the American Psychological Association.

After the organization had decided to participate in the study, information about the study was conveyed through the municipality's intranet, explaining the purpose of the study, method, and duration. It was stressed that participation was voluntary, anonymous, and that participants could withdraw at any time. All 950 employees of the municipality were then sent a personal E-mail with a link to the online questionnaire. During this first data collection, respondents were asked whether they would be willing to participate in a second measure. In total 659 questionnaires were completed. The data of respondents who were not willing to participate a second time ( $N = 326$ ) were used for Study 1; the data of those who agreed to participate again ( $N = 333$ ) were used for Study 2 and Study 3. In line with ethical regulations, the data were anonymized by removing the e-mail addresses of all participants after the second measurement.

Within the Study 1 sample, mean age was 49.5 years ( $SD = 9.0$ ); mean tenure was 16.6 years ( $SD = 10.1$ ), 56% were male, 18% had managerial tasks. Education included university (20%), higher (55%), middle (20%), and lower (5%) vocational training.

**Scale construction.** With our conceptualization of employees' perception of their supervisor idea adoption as a starting point, 30 items were generated that captured the three aspects of supervisor idea adoption: idea openness, idea selection, and idea application. Great care was given to stay close to these aspects, and avoid wordings that would overlap with items in measures of, for instance idea generation (Tierney, Farmer, & Graen, 1999) or innovative behavior (Janssen, 2000). As experts in the field of creativity and workplace innovation, three of the authors rated the content validity of these items, by indicating, on a five-point scale, the extent to which items were thought to represent the core of that subscale. For each aspect, the seven items with the highest mean validity scores were selected. These items were presented to five employees and five colleague researchers who reflected on the content and wording of the items. After incorporating their feedback and removing one item, a first set of 20 items was selected for further analysis; four of these items were counterindicative and should be reversed-scored. Example items were "My supervisor is open to my ideas" (idea openness), "My supervisor follows my ideas" (idea selection), and "My ideas are reflected in the work of my department" (idea application). Answers could be given on a five-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Following common practice in organizational research (e.g., Baer, 2012; Volmer et al., 2012), we consider Likert scales as pseudointerval scales that can be applied in interval-based analyses.

**Analyses.** Exploratory factor analysis (EFA) was used to investigate the structure of the measure and reduce the number of items. Rotation (i.e., Oblimin) was used because the three subscales were expected to (strongly) correlate ( $>.32$ ; Tabachnick & Fidell, 2007). Principal axis factoring (PAF) was applied because

this is appropriate when the measure includes scales that are measuring predefined dimensions. Furthermore, PAF is appropriate when trying to understand the shared variance in a set of  $x$  measurements through a small set of latent variables, called factors, as is the case here. Then, a confirmatory factor analysis (CFA) with maximum likelihood estimation was conducted to investigate the fit of the resulting measure with the data. Following Kline's (2005) recommendations, different fit indices were evaluated: the Tucker–Lewis index (TLI), the comparative fit index (CFI), the root mean squared error of approximation (RMSEA) and the standardized root-mean-square residual (SRMR). A good fit is indicated when TLI and CFI > .95 and when RMSEA and SRMR < .08. In addition to this statistical approach, we also looked at the content of the items. Items that are worded too similarly usually correlate highly; adding these items to the scale would result in a measure that is likely to show high internal consistency reliability but can be questioned in terms of coverage of the construct it is supposed to measure. As we used only few items for each subscale, it was very important to us that they would not be variations of the same item.

## Results and Conclusion

**Results.** The outcomes of a first EFA showed that the reversed-coded items loaded on a separate factor. The use of reversed-coded items is sometimes recommended to disrupt and control response bias (e.g., Paulhus, 1991). However, researchers have noted for years that reversed-coded items often lead to problems, such as unexpected factor structures (Netemeyer, Bearden, & Sharma, 2003; Weijters, Baumgartner, & Schillewaert, 2013). We therefore removed these items from the analysis. In order to maintain an equal number of items for each aspect, four more items were removed based on their content and factor loading. A new EFA with the resulting 12 items (four for each aspect) showed a clear structure with each item loading on the intended factor, and with substantial associations (factor correlations: .46–.65) between these factors as can be expected of factors representing a higher order construct.

In order to validate the scale scores' structure, a CFA was applied to these 12 items, with a second-order latent factor representing the higher order construct of supervisor idea adoption, and three first-order latent factors representing the different aspects. The outcomes indicated moderate fit,  $\chi^2(51) = 191.60, p < .001$ ; CFI = .96; TLI = .95; RMSEA = .09; 90% CI [.08, .11]; SMRM = .04; BIC = 342.06. Fit could be improved by removing three items, one of each subscale. The outcomes of the resulting 9-item scale indicated sufficient fit,  $\chi^2(24) = 73.84, p < .001$ ; CFI = .98; TLI = .97; RMSEA = .08; 90% CI [.06, .10]; SRMR = .02; BIC = 195.36. A chi-square difference test ( $\Delta\chi^2 = 117.78, \Delta df = 28, p < .001$ ) and a BIC comparison (342.06 vs. 195.36) indicated that the nine-item scale provided a better fit to the data than the 12-item scale. Additionally, the scale scores' structure was investigated by comparing the three-factor model with a one-factor model, with all nine items loading on the same general factor,  $\chi^2(27) = 218.16, p < .001$ ; CFI = .93; TLI = .90; RMSEA = .15; 90% CI [.14, .18]; SRMR = .04; BIC = 313.10. A chi-square difference test ( $\Delta\chi^2 = 144.32, \Delta df = 3, p < .001$ ) and a BIC comparison (313.10 vs. 195.36) indicated that the three-factor model was superior to the one-factor model that assumes an undifferentiated factor. Intercorrelations between the three latent factors ranged from .57 to .77.

To check whether the scores were normally distributed, the skewness and kurtosis of the nine items were investigated. Only two of the openness items showed some skewness >1 (range =  $-.38$ – $1.14$ ;) and kurtosis >1 (range =  $.02$ – $1.51$ ), which is within acceptable limits of  $\pm 2$  (Field, 2017). These results implied that we could proceed with our analyses.

McDonald's (1999) omega ( $\omega$ ) was calculated to assess the scale scores' internal consistency. Omega for the nine-item supervisor idea adoption scale was .93; subscale omegas were .90 (idea openness), .89 (idea selection), and .92 (idea application). Intercorrelations between the three scales, as derived from the observed item scores, ranged from .51 to .72. Table 1 presents the item factor loadings obtained in the exploratory factor analysis.

Table 1

*Items, Means, Standard Deviations, McDonald's Omega, and Item-Factor Loadings of the Supervisor Idea Adoption Scale (Study 1)*

	<i>M</i>	<i>SD</i>	$\omega$	Factor		
				1	2	3
Supervisor Idea Adoption Scale (full nine-item scale)	3.45	.64	.93			
Idea Openness (subscale)	3.81	.73	.90			
My supervisor is open to my ideas	3.82	.81		<b>.75</b>	.06	.07
I can discuss my ideas with my supervisor	3.91	.77		<b>.89</b>	.11	.01
My supervisor pays attention to my ideas	3.70	.80		<b>.75</b>	.20	.03
Idea Selection (subscale)	3.07	.66	.89			
My supervisor chooses my ideas for further development	3.04	.74		.22	<b>.67</b>	.14
My supervisor follows my ideas	3.10	.74		.01	<b>.92</b>	.00
My supervisor takes over my ideas	3.09	.73		.02	<b>.86</b>	.04
Idea Application (subscale)	3.48	.83	.92			
My ideas are reflected in the work of my department	3.44	.93		.00	.02	<b>.94</b>
Some of my ideas have been implemented in the organization	3.49	.87		.00	.02	<b>.86</b>
My colleagues work with my ideas	3.50	.89		.02	.02	<b>.87</b>

*Note.*  $N = 326$ . Answers are provided on a five-point Likert type scale (1 = *not applicable at all*, 5 = *fully applicable*). Item-factor loadings as derived from an exploratory factor analysis with oblimin rotation; bold values indicate factor loadings on their intended factor.

**Conclusion.** Study 1 resulted in a nine-item measure for the higher order construct of supervisor idea adoption that has three subscales assessing employees' perception of their supervisor's openness to ideas, idea selection, and idea application in workplace practices, respectively. The findings confirmed the structure of the measure and indicated that the scores of both the general scale and the subscales possess good internal consistency.

## Study 2: Confirmation of the Factor Structure and Establishing Convergent, Concurrent, and Divergent Validity

The second study aimed to confirm the scale scores' factor structure in a new sample, and to establish convergent, concurrent and divergent validity by investigating the scale scores' relationships with conceptually related and unrelated measures.

### Convergent Validity

To establish convergent validity, we searched for relevant criteria that are assumed to measure the same construct, such as idea selection, that could be used against the newly developed measure. Most studies on idea selection, however, make use of an experimental design and have participants actually select ideas (Rietzschel et al., 2010, 2014). As far as we know, no study has measured idea adoption or selection using a questionnaire; which was the main reason to develop a new measure. However, Janssen's (2000) scale for innovative behavior includes items that relate to idea promotion and idea realization, which show some similarities with the subdimensions of supervisor idea adoption. Because these items refer to ways to implement one's ideas, we used the term *idea implementation* to refer to the construct (Baer, 2012; Janssen, 2000) and expected a positive relationship with supervisor idea adoption.

### Concurrent Validity

Concurrent validity is established when the new scale is significantly related to measures that are likely to be associated with the new construct. Three variables were used for examining concurrent validity: idea generation, issue selling, and leader-member exchange. *Idea generation* refers to the production of novel and useful ideas (Amabile, 1988) and is considered an indication of employees' creative performance (Tierney et al., 1999) or creativity (Amabile, 1988). As the first step in the innovation process (Reiter-Palmon & Illies, 2004; Tierney et al., 1999), idea generation is a likely precursor of supervisor idea adoption; employees who produce more creative ideas will increase the chance that some of their ideas will be adopted.

Similarly, issue selling will impact the chance of supervisor idea adoption. *Issue selling* is the process by which individuals affect others' attention to and understanding of events, developments, and trends that have implications for organizational performance (Ashford, Rothbard, Piderit, & Dutton, 1998; Dutton, Ashford, O'Neill, & Lawrence, 2001). As such, issue selling is considered proactive behavior that is focused on organizational improvement and change (Parker & Collins, 2010). Ideas are more likely to be adopted if employees put more effort in selling these ideas (Dutton et al., 2001).

The leader-member exchange (LMX) relationship between employees and their leaders might also affect whether ideas are being adopted. LMX theory states that leaders form unique relationships with each of their subordinates, such that high-quality LMX-relationships are characterized by high levels of mutual support, trust, and loyalty (Graen & Uhl-Bien, 1995). Leaders who are in such trusting high-quality relationships will be more open to new ideas and more readily adopt these ideas and convert them into the daily work process. Several studies (e.g., Amabile, Schatzel, Moneta, & Kramer, 2004; Oldham & Cummings, 1996; Škerlavaj et al., 2014; Tierney et al., 1999) have already established positive relationships between leadership and employees' creative and innovative behaviors.

### Divergent Validity

To establish divergent validity, we investigated the relationship of employees' perceptions of supervisor idea adoption with two job characteristics, workload and social support from colleagues. *Workload* refers to the amount of work employees need to carry out within a specific time frame. We could think of no reason why the workload that employees experience would strongly affect leaders' adoption of creative ideas. One might argue that workload can have an impact on idea generation and creativity, but this relationship can go two ways (Byron, Khazanchi, & Nazarian, 2010); although a certain level of workload might enhance idea generation (Hammond et al., 2011), an excessive workload might undermine the generation of new ideas (Amabile, 1996). Moreover, a relationship of workload with supervisor idea adoption has not appeared in the literature.

Similarly, we did not expect a strong relationship between employee perceptions of supervisor idea adoption and colleagues' social support. Colleagues' *social support* refers to the emotional and practical help employees receive from their coworkers which makes them feel valued and enmeshed in a network of communication and mutual obligation (Van der Heijden, Van Dam, & Hasselhorn, 2009). Employees may perceive and receive social support from colleagues regardless of their contribution to workplace innovation or the adoption of their ideas.

### Method

**Participants.** Participants were 334 employees of the same Dutch municipality that was described in Study 1. In this sample, mean age was 48.6 years ( $SD = 8.6$ ); mean tenure was 16.6 years ( $SD = 9.79$ ), 53% were male, 18% had managerial tasks. Education included university (20%), higher (53%), middle (23%), and lower (4%) vocational training.

#### Measures.

**Supervisor idea adoption.** For measuring employees' perception of their supervisor idea adoption, we used the nine-item scale that resulted from Study 1. Omega was respectively .89 for idea openness, .86 for idea selection, .89 for idea application, and .91 for the full supervisor idea adoption scale.

**Idea implementation.** Idea implementation was measured with five items ( $\omega = .95$ ) of Janssen's (2000) scale for innovative work behavior that refers to idea promotion and idea realization (e.g., I mobilize support for innovative ideas; I transform innovative ideas into useful applications). Responses could be given on a seven-point scale (1 = *never*, 7 = *always*).

**Idea generation.** Idea generation was measured with a nine-item scale ( $\omega = .94$ ) developed by Tierney et al. (1999) and previously used by Carmeli and Schaubroeck (2007). Answers could be given on a seven-point scale (1 = *never*, 7 = *always*). A sample item was, “I try out new ideas and approaches to problems.”

**Issue selling.** The scale for issue selling is developed by Ashford et al. (1998). The scale has five items ( $\omega = .90$ ) that could be answered on a five-point scale (1 = *not applicable at all*, 5 = *fully applicable*). A sample item was, “I am committed to promoting my ideas in the organization.”

**Leader-member exchange.** Employees were asked to rate the LMX relationship with their supervisor using the LMX7 scale (Graen & Uhl-Bien, 1995). A five-point response scale was used (1 = *strongly disagree*, 5 = *strongly agree*). Omega was .94. A sample item was, “My working relationship with my leader is good.”

**Workload.** Workload was measured with the three-item workload scale ( $\omega = .83$ ) of the SIMPH, a validated scale for work characteristics (Notelaers, De Witte, Van Veldhoven, & Vermunt, 2007). A five-point response scale was used (1 = *never*, 5 = *always*). A sample item was, “I work under time pressure.”

**Social support colleagues.** Colleagues’ social support was assessed with a three-item SIMPH scale (Notelaers et al., 2007). A five-point response scale was used (1 = *never*, 5 = *always*). Omega was .81. A sample item was, “I can, if necessary, ask my colleagues for help.”

## Results and Conclusion

**Structure validation.** To investigate the scale scores’ structure, confirmatory factor analyses were conducted with three first-order latent factors and a higher order latent factor, for the nine-item scale. The outcomes indicated sufficient fit,  $\chi^2(24) = 61.46$ ,  $p < .001$ ; CFI = .98; TLI = .97; RMSEA = .07; 90% CI [.05, .09]; SRMR = .03; BIC = 184.89. Additionally, the three-factor model was compared with a one-factor model with all nine items loading on the same general factor,  $\chi^2(27) = 239.11$ ,  $p < .001$ ; CFI = .90; TLI = .90; RMSEA = .16; 90% CI [.14, .18]; SRMR = .03; BIC = 362.55. A chi-square difference test ( $\Delta\chi^2 = 144.32$ ,  $\Delta df = 3$ ,  $p < .001$ ) and a BIC comparison (313.10 vs. 195.36) indicated that the three-factor scale was superior to the one-factor model. All first-order latent factors loaded significantly on the higher order latent factor (range = .73–.86,  $p < .001$ ), and all items loaded significantly on their factor (range = .66–.90,  $p < .001$ ). Intercorrelations between the three latent factors ranged from .63 to .73. The CFA factor loadings and interitems correlations of Study 1 and Study 2 are included in the [online supplemental materials](#).

**Convergent, concurrent, and divergent validities.** Table 2 shows means, standard deviations, and reliabilities of the study variables together with the correlations of the idea adoption scales with the scales chosen to examine validity. The full correlation matrix is included in the [online supplemental materials](#). As expected, supervisor idea adoption scale scores showed significant positive relationships with scales scores chosen to establish convergent and concurrent validity: idea implementation ( $r = .36$ ,  $p < .001$ ), idea generation ( $r = .35$ ,  $p < .001$ ), issue selling ( $r = .41$ ,  $p < .001$ ), LMX ( $r = .58$ ,  $p < .001$ ), and lower relationships with scales scores chosen to establish divergent validity: workload ( $r = .22$ ,  $p < .001$ ) and colleagues’ social support ( $r = .09$ , *ns*).

Table 2

*Descriptive Statistics and Correlations of the Supervisor Idea Adoption Scale and Subscales With Scales Scores Chosen to Establish Validity (Study 2)*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4
1. Idea adoption	3.47	.61	—			
2. Idea openness	3.83	.71	.85**	—		
3. Idea selection	3.10	.63	.85**	.66**	—	
4. Idea application	3.47	.82	.85**	.54**	.57**	—
5. Idea implementation	2.93	1.27	.36**	.20**	.35**	.36**
6. Idea generation	3.48	1.13	.35**	.19**	.35**	.36**
7. Issue selling	3.10	.69	.41**	.21**	.43**	.41**
8. LMX	3.67	.73	.58**	.65**	.49**	.36**
9. Workload	3.32	.63	.22**	.18**	.19**	.20**
10. Social support colleagues	3.93	.65	.09	.15*	.02	.06

Note.  $N = 333$ . LMX = leader-member exchange. Only correlations for construct validity are presented.

\*  $p < .05$ . \*\*  $p < .01$ .

There were some interesting differences in the subscale scores’ associations with the other scale scores. Although LMX was consistently related to all three subscale scores, it was associated to leaders’ openness to employees’ ideas ( $r = .65$ ,  $p < .001$ ) more strongly than the application of those ideas into workplace practices ( $r = .36$ ,  $p < .001$ ). An inverted pattern was observed for some of the other variables. Issue selling, for instance, showed a stronger association with idea selection ( $r = .43$ ,  $p < .001$ ) and application ( $r = .43$ ,  $p < .001$ ) than with leaders’ openness to those ideas ( $r = .21$ ,  $p < .001$ ). A similar pattern was found for idea generation, which was more strongly related to idea selection ( $r = .35$ ,  $p < .001$ ) and idea application ( $r = .36$ ,  $p < .001$ ) than to leaders’ openness to ideas ( $r = .19$ ,  $p < .001$ ).

**Conclusion.** Together, the findings provided evidence for the construct validity of the perceived supervisor idea adoption scale. The analyses reconfirmed the structure of the scale. The presence of strong subscale intercorrelations and the high loadings of the first-order factors on the higher order factor suggest that the subscales represent aspects of the same overarching concept. Additionally, the findings showed that the general scale, as well as the subscales, were reliable. Moreover, the scales showed meaningful associations with the measures of the variables that were chosen to establish validity, such as idea implementation, LMX, idea generation and issue selling. The correlations with workload and colleague social support were only moderate and substantially lower than the scales’ reliabilities, thus providing evidence for the construct’s divergent validity (Campbell & Fiske, 1959). As a limitation, it could be argued that these relationships were studied using a cross-sectional design and a single method for collecting the data, which might cause inflated correlations due to method bias (Spector, 2019). Although method bias cannot be ruled out, the patterns of correlations as well as the outcomes of the CFA—which indicated that there is no conceptual overlap between variables—should alleviate these concerns (Conway & Lance, 2010).

## Study 3: Investigating Test-Retest Reliability

The objective of Study 3 was to investigate the temporal consistency of the scale scores by establishing test-retest reliability over a 3-month period. Table 3 shows the descriptive statistics and

Table 3  
*Descriptive Statistics and Correlations Among the Supervisor Idea Adoption Scale and Subscales at T1 and T2 (Study 3)*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Idea adoption T1	3.47	.61	(.90)							
2. Idea adoption T2	3.47	.60	.67**	(.92)						
3. Idea openness T1	3.81	.75	.86**	.57**	(.88)					
4. Idea openness T2	3.78	.70	.56**	.86**	.59**	(.90)				
5. Idea selection T1	3.06	.62	.84**	.56**	.66**	.44**	(.85)			
6. Idea selection T2	3.06	.63	.56**	.89**	.47**	.73**	.53**	(.89)		
7. Idea application T1	3.52	.70	.83**	.56**	.53**	.40**	.54**	.44**	(.87)	
8. Idea application T2	3.56	.76	.59**	.83**	.41**	.49**	.49**	.60**	.59**	(.90)

Note. *N* = 189. The values in parenthesis are internal consistency estimates. T1 = first data collection; T2 = 3-month follow-up.

\*\*  $p < .01$ .

correlations between the supervisor idea adoption scale and subscales at the time of the first data collection (T1) and at the time of the second data collection, 3 months later (T2).

## Method

**Participants.** Three months after data collection, the 334 respondents who participated in Study 2 were invited to fill out a short questionnaire containing the supervisor idea adoption scales. In total, 189 participants completed the second questionnaire (57% response rate). Mean age was 48.9 years ( $SD = 8.9$ ), mean tenure was 16.0 years ( $SD = 8.98$ ), 51% were male, and 18% had managerial tasks. Education included university (21%), higher (50%), middle (23%), and lower (6%) vocational training.

**Measures.** To measure employees' perception of their supervisor idea adoption, we used the nine-item scale that resulted from Study 1. Omega was respectively .88 (T1) and .90 (T2) for idea openness, .85 (T1) and .89 (T2) for idea selection, .87 (T1) and .90 (T2) for idea application, and .90 (T1) and .92 (T2) for the full supervisor idea adoption scale. Intercorrelations between the subscale scores ranged from .53 to .67 (T1) and .49 to .73 (T2).

**Analyses.** Test-retest reliability was established by calculating the (Pearson product-moment) correlations between the T1 and T2 scores at the item, subscale, and general scale level.

## Results and Conclusion

**Results.** As Table 3 shows, the scale scores at T1 correlated highly with the scale scores at T2. At scale level, the T1 and T2 intercorrelations were respectively .67 for the full supervisor idea adoption scale, .59 for the idea openness subscale, .53 for the idea selection subscale, and .59 for the idea application scale. At item level, the T1 and T2 intercorrelations ranged from .43 to .54 for the idea openness scale, .41 to .47 for the idea selection scale, and .50 to .55 for the idea application scale, respectively.

**Conclusion.** The findings showed substantive associations between the measures at the first data collection (T1) and the data collection 3 months later (T2). When interpreting these intercorrelations, it should be noted that supervisor idea adoption is not a stable phenomenon, such as for instance cognitive competencies. Instead, it is a perception of a specific work situation that may vary over time, and probably will vary during a 3-month period. Therefore, the criteria that are applied to measures of stable constructs are not applicable in this case. As Crocker and Algina (2008)

noted, whether a test-retest reliability estimate is acceptable depends on several factors such as time between tests and purpose of the test. Given the 3-month interval and the fluctuating nature of supervisor idea adoption we consider the associations of .67 at full scale level, and .53 to .59 at subscale level indicating acceptable test-retest reliability. Moreover, as omegas were high for all scales, we can safely conclude that our supervisor idea adoption scale scores have shown good internal consistency as well as acceptable test-retest reliability.

## General Discussion

The aim of this study was to develop and validate a scale that measures employees' perceptions of the adoption of ideas by their supervisors in a workplace setting. The concept of idea adoption and its importance for innovation is rapidly gaining attention in the literature (De Buissonjé et al., 2017; Rietzschel et al., 2010, 2014), as innovation is widely recognized as crucial for the survival and success of organizations. The measurement instrument of supervisor idea adoption as perceived by employees is a useful tool for assessing employee perceptions of their supervisors' behavior in terms of identifying, selecting and implementing creative ideas of employees. Our findings indicate that the scale, including its subscales, is a valid measure for employees' perception of supervisor idea adoption, with scale scores that show good internal consistency. We demonstrated convergent validity with theoretically related constructs such as LMX, idea generation and issue selling, and divergent validity with workload and colleagues' social support.

Theoretically, this study contributes to creativity research in general and to research on idea adoption in particular. It responds to the need for studies on the development of measures that specifically target the idea adoption process at the workplace (De Buissonjé et al., 2017; Rietzschel et al., 2010, 2014). Until now, studies about idea adoption have mainly employed experimental designs, and often using student samples; moreover, they have focused on the characteristics of the ideas that were chosen where research participants often have to evaluate and select their own ideas (e.g., Rietzschel et al., 2010). As such, our study contributes to workplace research on creative processes in at least three ways: by emphasizing the importance of a real life context for creativity and innovation research; by looking at the leader as crucial determinant of the ideas that are being adopted for implementation; and by providing a valid and reliable measure that assesses the extent



to which the leader is perceived as open to an employee's ideas, and selects and applies these ideas. Developing a measure of perceived supervisor idea adoption promotes future research on the role of idea adoption in creating innovation. The benefit of the perceived supervisor idea adoption scale is that it is a brief nine-item measure that can be incorporated into questionnaires about creativity and innovation. As such, this scale is an important addition to existing scales for idea generation as these do not cover idea selection and adoption.

From a managerial perspective, the scale can be used in surveys about creative and innovative behavior within firms. Furthermore, the scale can be a valuable tool for organizational psychologists. The scale allows them to recognize managers who are open to ideas from employees, select these ideas, and apply them to workplace practices. By identifying these managers and the managers who display less idea adoption behavior, organizations can develop human resource practices and interventions to increase their firm's creative and innovative power. In this way, successful managers can receive more leeway and others can be provided with opportunities for personal development oriented at awareness of their idea adoption behavior. Relevant in this context is the study by Herman and Reiter-Palmon (2011) that shows that inducing a promotion focus (Higgins, 1997) in individuals can lead them to better assess the originality and creativity of ideas. There may be human resource practices that can induce this focus in managers who are at a position in which they have to evaluate and assess ideas from others.

### Limitations and Future Studies

One of the limitations stems from the fact that our sample consisted of Dutch employees working for a governmental organization. Future research could validate the scale in other settings and other countries and investigate its potential across a variety of contexts. Another limitation is the cross-sectional nature of our data in Study 2, which does not allow for investigating causality in the relationship of idea generation, idea promotion and LMX with supervisor idea adoption. Finally, it is possible that some supervisors were rated more than once, which calls for a multilevel approach in data analysis. Although supervisors are likely to respond differently to subordinates, it is still possible that there was some dependency in the data that is unaccounted for.

Our scale addresses the extent to which employees perceive that the organization (represented by the supervisor) will adopt their idea, irrespective of the specific characteristics of the idea. The underlying assumption is that some supervisors may be more open to novel ideas of subordinates, more prone to follow those ideas, and more willing to implement ideas of subordinates into the organization compared with other supervisors. It may be interesting for future research to connect our scale to measurements that capture the quality of the idea or other characteristics of the idea such as uniqueness, popularity or market potential, similar to what has been done in idea evaluation and assessment research (De Buissonjé et al., 2017; Rietzschel et al., 2010, 2014) and creative forecasting research (Berg, 2016). Our scale was intended to capture these effects, yet future research may want to explore the potential of combining our perceived supervisor idea adoption scale with measurements capturing idea characteristics within one study. Relatedly, it may be the case that the perceptions of em-

ployees about supervisor idea adoption are not in line with the actual idea adoption by the supervisor. Future research may want to address this issue by measuring perceived as well as actual supervisor idea adoption. This future research may further support the validity of the scale.

Future research that aims to identify causal relationships should apply longitudinal research designs (Ployhart & Vandenberg, 2010). These studies can focus on explaining what determines perceived supervisor idea adoption as well as investigate the consequences of perceived supervisor idea adoption. Regarding predictors, our findings already indicate that employees in a good-quality LMX relationship with their leaders perceive that their ideas are more readily adopted than the ideas of employees in a low-quality LMX relationship. Similarly, the associations in this study suggest that idea generation and idea promotion increase the chance that employees' ideas are adopted. Using the perceived supervisor idea adoption scale, future studies can further explore the social-political processes and individual behaviors and characteristics that affect the perception of idea adoption in the workplace. In this respect it may also be interesting to broaden the scale by including items that measure the role of team members in idea adoption. Future research should also focus on the consequences of perceived supervisor idea adoption. It is likely that perceived supervisor idea adoption may have a broad array of positive consequences for employee attitudes and behavior. Employees who perceive that their ideas are being adopted may experience increased self-efficacy, work engagement, job satisfaction, commitment, and organizational support. Also, perceived supervisor idea adoption may enhance, in turn, creative performance, as employees are confirmed that their ideas are valuable. In this way, a positive spiral may develop that becomes part of a creative and innovative climate and, in the end, enhances the organization's innovative performance and adaptive value.

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