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Trait resilience instigates innovative behaviour at work? A cross-lagged study

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Being able to deal with change and setbacks at work is a major reason why many people generate, promote and implement new ideas at work, supporting organizations in their strive for success including innovation outcomes. Yet, surprisingly little research has examined the underlying mechanisms through which trait resilience influences innovative behaviour at work. Drawing upon control theory in conjunction with the affect-as-information perspective, we theorize why resilience as a core personality trait affects innovative behaviour at work. Performing cross-lagged analyses on two-wave data, our analyses demonstrate that resilience positively relates to employees' innovative work behaviour due to increased levels of positive emotions. We conclude that being able to deal with change and setbacks at work generates a powerful pool of emotions that can boost innovative behaviour at work, offering meaningful implications for research on innovation and the dynamics of personality and emotions at work.

KEYWORDS

cross-lags, emotions, innovative work behaviour, resilience

1 | INTRODUCTION

How does employees' trait resilience influence innovative work behaviour (IWB)? Anderson et al. (2014, p. 4) define IWB as 'Creativity and innovation at work are the process, outcomes, and products of attempts to develop and introduce new and improved ways of doing things. The creativity stage of this process refers to idea generation, and innovation to the subsequent stage of implementing ideas toward better procedures, practices, or products'. Creativity and innovation at work are important determinants of organizations' financial and operational success, with especially employee IWB having been shown to be an important organizational asset (for an overview, see Woods et al., 2018) in dynamic environments (Wojtczuk-Turek & Turek, 2015). This is because IWB encourages

organizations to harness and foster the creative and innovative potential of their employees (Anderson et al., 2004; Bak, 2020). IWB consists of several discrete dimensions, including idea generation, idea promotion and idea implementation (Axtell et al., 2000; Janssen, 2000; Scott & Bruce, 1994). Idea generation can be conceptualized as employee behaviour that contributes to finding opportunities for improvement, generating original ideas for solutions to problems or difficult issues and finding new ways of working (Farr & Ford, 1990; Kanter, 1988). Idea promotion refers to behaviours associated with promoting the new idea to sponsors and supporters who provide the necessary power to back-up implementation of the idea (Janssen, 2000; Kanter, 1988). Idea implementation behaviours have to do with applying the idea within a team or within the organization.

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To date, there is mounting evidence to suggest that employee characteristics can promote or hinder their innovative behaviour at work. For example, Amabile et al. (2004) and others (e.g., De Clercq & Pereira, 2019; Sweetman et al., 2011; Todt et al., 2018) identified psychological resources, such as resilience, as instrumental to creativity and innovation at work. Although such research emphasizes the value of studying employee characteristics in the creativity and innovation context, these studies typically examine direct and thereby isolated effects (for an overview, see Hammond et al., 2011). Thus, they ignore the 'why' and thereby the mechanism through which the characteristics of employees influence IWB. This study argues that positive emotions are an important overlooked psychological mechanism that underlies the specific relationship between employee trait resilience and IWB. Positive emotions are widely studied as a broad dimension of affect that points to different positive feelings and mood (Watson et al., 1988) and have been shown to foster creative performance at work (e.g., Amabile et al., 2004; Baas et al., 2008; Hennessey & Amabile, 2010; Isen et al., 1987; Yang & Hung, 2015).

In addition, although there is a flourishing literature on positive emotions in the creativity and innovation context, much research is still needed to elucidate the role of positive emotions for IWB. Until now, studies have either focused on how differences in positive and negative emotions explain innovation-related *performance*, disregarding innovative work *behaviour* (Baas et al., 2008; Madrid et al., 2014; Seo et al., 2008); or they have explored the effect of emotions on a *general measure* of IWB (Madrid et al., 2014).

In order to capture a more complete understanding of the innovative employee, we aim to examine the cross-lagged relationship between trait resilience and IWB, mediated by positive emotions, thus contributing a new holistic perspective on the innovative employee. We test our model using field survey data, collected in two waves among Dutch employees, and applying structural equations modelling.

Overall, the novel theorizing and empirical examination of employee personality, emotions and IWB holds several contributions. Firstly, we expand theory on creativity and innovation by establishing the 'why' and thereby the causal mechanism linking personality and innovative behaviour at work. We draw on control theory in conjunction with the affect-as-information perspective (Carver, 2003; Forgas, 1995) to develop the argument that resilience is uniquely supportive of IWB because it allows employees to resolve the discrepancy between current and desired states leading to positive emotions. This, in turn, allows individuals to experience psychological safety and adhere to challenging goals and heuristic and creative processing strategies, which stimulate innovative behaviour at work. Linking personal psychological attributes (resilience) to IWBs expands current theorizing on how to foster creativity and innovativity at work. By employing cross-lagged analyses on two-wave data, we further advance current studies about IWB and idea generation that have predominantly used cross-sectional or experimental designs (e.g., George & Zhou, 2007), thus making it impossible to investigate the direction of the relationships. Secondly, by focusing on innovation at work as a behaviour rather than as performance, and empirically considering its multidimensional nature, we highlight the importance

of considering the innovation processes at work. Herewith, our research answers the call for studies that test the impact of positive emotions on specific forms of IWB (Madrid et al., 2014). In fact, we demonstrate and discuss why positive emotions may be a resource or outcome depending on the innovation output required according to the affect-as-information perspective.

Finally, as a practical contribution, our enhanced understanding of the individual psychological antecedents of idea generation, promotion and implementation can steer efforts to develop and foster creativity in organizations.

2 | THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

In recent years, scholars have devoted growing attention to employee resilience (King et al., 2016; Van der Vegt et al., 2015) and positive adaptations in the face of adversity (Sutcliffe & Vogus, 2003). Research on resilience is a core element of positive organizational behaviour (Luthans, 2002). Especially interest in workplace resilience has greatly increased in recent years due to today's disruptive and adverse work environment (Meneghel, Martínez, et al., 2016; Meneghel, Salanova, et al., 2016). Resilience at work focuses on the trait-like characteristic to bounce back and flourish despite experiencing adversity and setbacks, specifically in a work context (Smith et al., 2008). Resilient employees excel in accomplishing diverse organizational goals, including organizational commitment and job performance (Coutu, 2002; Luthans & Youssef, 2007; Meneghel, Martínez, et al., 2016; Wang et al., 2017; for an overview of general outcomes of resilience in the workplace, see Hartmann et al., 2020). Resilience has also been shown to be positively related to employee job satisfaction and happiness at work (Luthans & Youssef, 2007).

Resilience is likely to be most relevant when the task environment is uncertain and challenging, as is characteristically the case during innovation processes. Innovation projects are subject to frequent failure, which intensely affects the people involved (Moenkemeyer et al., 2012). Only a few ideas will succeed and generate improvements, and most ideas will fail (Caniëls & Baaten, 2019; Simonton, 2018; Tesluk et al., 1997). When employees have to engage in new innovative activities, while having to deal with a prior failed idea over which they may have lost blood, sweat and tears, resilience is key (Moenkemeyer et al., 2012). Employees who are resilient have an ability to successfully deal with adversity (Wagnild & Young, 1993). They learn from setbacks and utilize these as an input for personal development and growth, which instigates their capability to cope more effectively with further challenges and setbacks (Salovey et al., 1999), such as those that are inherent in the generation, promotion and implementation of ideas. Altogether, resilience at work appears to relate to idea generating, idea promoting and idea implementing behaviours of employees. Despite this evidence, it remains unclear which mechanism catalyses this relationship between resilience and IWB.

2.1 | Hypotheses

We draw on control theory in conjunction with the affect-as-information perspective to explain why trait resilience affects IWB through positive emotions. First, we use control theory to argue how trait resilience affects positive emotions. Control theory assumes that reducing discrepancy between a current state and a desired state results in positive emotions (Carver, 2006; Carver & Scheier, 1982). Applied to our study context, the rationale is that the more resilient employees are, the more strongly they can reduce discrepancies between the current state and their desired state as they are better able to deal with change and setbacks at work (as opposed to less resilient ones). Reducing the actual-desired state discrepancy is associated with experiencing positive emotions, such as happiness, excitement or elation (Carver, 2006; Carver & Scheier, 1982; Gielnik et al., 2015). It is important to note that already making progress towards resolving the discrepancy, such as by being able to deal with change and setbacks at work, has positive effects on people's emotions (Amabile & Kramer, 2011; Weick, 1984). Tugade and Fredrickson (2004) also support the position that resilience precedes positive emotions and found that 'high-resilient individuals tend to experience positive emotions even amidst stress' (p. 331; see also Tugade & Fredrickson, 2007). With regard to our study, this means that employees' resilience should uplift their positive emotions. In other words, control theory suggests that trait resilience leads to positive emotions (and not the other way around).

Hypothesis 1. Trait resilience has a positive effect on positive emotions at work.

Based on the suggestion that people engage in self-regulation to reduce discrepancies between actual states and desired states (Carver & Scheier, 1990), and drawing on the associated affect-as-information perspective (Carver, 2003; Forgas, 1995), we argue for a positive relationship between positive emotions and IWB in terms of idea generation, promotion and implementation. First, positive emotions signal that things are going well and that the present environment is safe (Fredrickson, 2001; Schwarz & Clore, 1983). Creativity and innovation are encouraged in safe environments (Carmeli & Spreitzer, 2009), because individuals can use this information as a signal that they can engage in proactive behaviours (Foo et al., 2009), including innovative behaviours. Second, positive emotions favour more heuristic and creative processing strategies, which are likely to manifest in stronger innovative behaviour at work. Third, positive emotions broaden the scope of attention (Fredrickson & Branigan, 2005), which allows individuals to better guide one's behavioural response towards effective goal pursuit. Individuals are more likely to set themselves challenging goals when they experience positive emotions (Cardon et al., 2009), which motivate them to expend greater effort and behave in innovative ways at work. Hence, the affect-as-information perspective suggests that positive emotions lead to behaviours (and not to traits, such as trait resilience, for instance). We expect positive emotions to be related to all three

dimensions of IWB as there is no theoretical basis for expecting a differential impact. Positive emotions are expected to signal a safe environment for idea generating, idea promoting and idea implementing behaviours alike.

Hypothesis 2. Positive emotions at work have a positive effect on IWB (i.e., idea generating, idea promoting and idea implementing behaviours).

Displaying IWB requires employees to be intrinsically motivated and at-the-ready to face challenges, overcome setbacks and thereby be resilient (Tamir, 2016). Positive emotions positively influence employees' ways of thinking and generate enjoyment in their work, which inspires IWB (Tamir, 2016). Thus, we posit a mediating role of positive emotions in the relationship between trait resilience on IWB. In particular, given (a) the explanatory framework of control theory in conjunction with the affect-as-information perspective that proposes that people aim at reducing discrepancy between a current state and a desired state, even more so if they are able to do so, and use the resulting positive emotions as information for behaviour; (b) previous research such as by Tugade et al. (2004) that support the mediating role of positive emotions; (c) the hypothesized relationship between resilience and positive emotions; and (d) the hypothesized relationship between positive emotions and IWB, we expect that positive emotions will mediate the relationship between resilience and the idea generation, promotion and implementation behaviours relevant to innovation. Hence, positive emotions are the mechanism via which trait resilience leads to IWB. In other words, the occurrence of positive emotions is the reason for the connection between trait resilience and IWB. Specifically, we derive the following hypothesis:

Hypothesis 3. Positive emotions mediate the relationship between trait resilience and IWB (i.e., idea generating, idea promoting and idea implementing behaviours).

3 | METHODS

3.1 | Sampling and procedure

We studied employees from various Dutch organizations. We used a random sample of 199 employees with paid work in The Netherlands. Although the respondents in our sample were not necessarily responsible for driving innovation in their organizations, they were able to address our questions as we were predominantly interested in the level of idea generation, promotion and implementation that they displayed in doing their regular tasks at work, in terms of providing ideas for improvements, solving problems and trying new working methods, techniques or instruments.

Data were gathered via an online questionnaire in the spring of 2019 (Time 1) and 6 months later in autumn 2019 (Time 2). Other studies capturing behavioural outcomes have used a similar lag

(e.g., Zhang et al., 2021) and have shown that a 6-month lag is appropriate for extracting information on behavioural patterns (Shoda et al., 1994). A lag of 6 months is sufficiently long in that the responses given in the first measurement are less likely to be recollected and confound responses in the second measurement (Dormann & Griffin, 2015). Each survey included the same questions. In total, 450 employees received the questionnaire in the first wave. After 1 week, a reminder was sent. In total, 333 (74%) questionnaire forms were completed. Removing inconsistent and incomplete questionnaires left us with 302 (67%) usable responses. These 302 respondents received a follow-up questionnaire after 6 months, of which 199 were returned, resulting in a drop-out of 103 respondents in the second wave, and a respective response rate of 66% (of 333). Potentially, drop-outs may distort results and conclusions, especially when there is evidence for selective participation in the follow-up measurement. To address potential selection bias, we have performed a multivariate analysis of variance (MANOVA) to assess whether significant differences exist between the drop-outs and the follow-up respondents. We found no statistical differences between the groups with $F(7, 294) = 1.616$, $p > .05$; Wilk's $\Lambda = .963$, partial $\eta^2 = .04$. Based on these results, there is little evidence of a selection bias. Hence, drop-outs do not significantly differ from the follow-up respondents.

The gender distribution in our data is balanced as 49.7% of the respondents identified as male and 50.3% as female. On average, the respondents are 46.3 years old (SD 12.3). Most of the respondents belong to middle and upper social class (83.4%), whereas the remaining 16.6% belong to the working class. Regarding educational background, 59.3% of the respondents received vocational training, 27.1% have an undergraduate degree and 13.1% hold a graduate degree. With regard to the professional characteristics of the respondents, the average number of years of work experience is 11.8 (SD 10.5), with 57.3% of the respondents working up to 10 years for their current employer, and 34.7% of the respondents being tenured between 11 and 30 years and the remaining 8.5% being tenured for more than 30 years.

We gathered data by using self-reports, which may harbour a risk of common method bias. Yet, using self-reports is warranted given the fact that we aim to measure persons' resilience, which is difficult for external raters to assess (Conway & Lance, 2010; Kim et al., 2013). Nevertheless, we decided to remedy common method bias by collecting data about our dependent variable at a later moment in time (Time 2) than the independent variables (Time 1). Additionally, we used several strategies to remedy risks on common method bias by following procedural suggestions of Podsakoff et al. (2003), Conway and Lance (2010) and Spector (2006). Firstly, to reduce respondents' evaluation apprehension and social desirability bias, we guaranteed to protect respondents' identity and requested honest answers from participants (Podsakoff et al., 2003). Respondents could stop participating during the survey at any time. We requested participants to explicitly provide their informed consent before starting the survey. All in all, we expect the risk for common method bias in our data set to be low.

3.2 | Measures

All variables were measured twice, using multiple-item scales closely following internationally validated scales. The survey contained the following variables.

Resilience refers to the personal disposition to bounce back from hardship and adversity and adapt to changed circumstances and thrive (Smith et al., 2008). It was measured by six items from the brief resilience scale from Smith et al. (2008), which was designed to measure trait resilience in work situations ($\alpha_{T1} = .81$, $\alpha_{T2} = .82$). The scale ranged from 1 (*strongly disagree*) to 7 (*strongly agree*). An example item is 'It does not take me long to recover from a stressful event'.

Innovative work behaviour was measured by using Janssen's nine-item Innovative Work Behavior Scale (2001), which was based on the scale for individual innovative behaviour (IWB) at work created by Scott and Bruce (1994). Employees rated how often they performed innovative activities from 1 (*never*) to 7 (*always*). The IWB scale consists of three dimensions: idea generating behaviour, idea promotion behaviour and idea implementation behaviour. *Idea generating behaviour* refers to the self-reported extent in which employees create ideas for improvements, generate solutions for problems at work and try out new working methods. An example item is 'I create new ideas for improvements'. *Idea promotion behaviour* refers to the self-reported extent in which employees acquire support for innovative ideas. An example item is 'I mobilize support for innovative ideas'. *Idea implementation behaviour* reflects the self-reported extent in which employees translate innovative idea into actual applications. An example item is 'I transform innovative ideas into useful applications'. Confirmatory factor analysis confirmed the three-factor structure of the scale and showed that the separate dimensions of the scale should be used as independent variables. Specifically, the three-factor model at T2 ($\chi^2 = 54.192$; $df = 24$; root mean square error of approximation [RMSEA] = .08; comparative fit index [CFI] = .98; Tucker-Lewis index [TLI] = .97; standardized root mean square residual [SRMR] = .03) showed a better fit with the data than the one-factor model at T2, which lumps all dimensions of IWB into one variable ($\chi^2 = 165.293$; $df = 27$; RMSEA = .16; CFI = .90; TLI = .87; SRMR = .06). Additionally, the Vuong (1989) closeness test indicated that the three-factor model fits better than the one-factor model ($p < .000$). The estimated reliability was $\alpha_{T1} = .87$, $\alpha_{T2} = .85$ for the idea generating behaviour scale; $\alpha_{T1} = .90$, $\alpha_{T2} = .91$ for the idea promotion behaviour scale; and $\alpha_{T1} = .91$, $\alpha_{T2} = .91$ for the idea implementation behaviour scale.

Positive emotions denote the extent to which someone feels enthusiastic, active and alert (Watson et al., 1988). High scores on positive emotions indicate 'a state of high energy, full concentration, and pleasurable engagement' (Watson et al., 1988, p. 1063). We asked respondents to assess the extent to which they felt each of 10 positive emotion terms (e.g., enthusiastic, excited and inspired) from the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) at work during the past 30 days. We chose 30 days as the time that it is reasonable to expect respondents to recollect their feelings and emotions. Whereas PANAS provides many possible time

frames, a similar scale measuring feelings and emotions at work, Job-Related Affective Well-Being Scale (JAWS; Van Katwyk et al., 2000), explicitly requests respondents to reflect on their feelings and emotions in the past 30 days. We followed their recommendation. Furthermore, we wanted to ensure that the measured positive emotions were not personal traits; therefore, we specifically asked employees about their emotional expression at work during the past 30 days. The scale was anchored by 1 (*very slightly or not at all*) to 5 (*extremely*). The positive affect constructs have demonstrated high reliability across various samples (Watson et al., 1988; Watson et al., 1994). In our sample, estimated reliability was $\alpha_{T1} = .88$ and $\alpha_{T2} = .88$.

Controls. Several control variables were assessed because studies have suggested that the demographic background of employees may account for some of the variance in their resilience (Meneghel, Salanova, et al., 2016). We measured age in years and we measured tenure by years of experience in the current or similar function. Gender was coded '1' for male and '2' for female. As an additional control variable, we assessed education level.

3.3 | Analytic approach

Testing a mediation model requires a longitudinal design as the idea behind mediation is that one variable (X) causes variation in another variable (M), which in turn has an impact on the outcome variable (Y). Hence, the mediating variable (M) must be determined by the predictor variable (X) and therefore X must precede M in time. Similarly, the outcome variable (Y) must be determined by the mediating variable (M) and therefore Y must be measured at a later moment in time than M. Thus, in order to study a mediation process, time must elapse for one variable to have an impact on another (Taris & Kompier, 2006).

Ideally, one would use a three-wave study to test a mediation model, because three waves of data allow for measuring X before M and M before Y. Furthermore, three-wave data allow for controlling for the level of M at a previous measurement moment. In this way, one can make sure that X is regressed on the *difference* in M between measurement moments 1 and 2 and not just on the *level* of M at measurement moment 2. Similarly, one should make sure that M is regressed on the difference in Y between measurement moments 2 and 3; that is, one should control for the effect of autoregression.

When using data from a two-wave study, it is still possible to examine mediation (Cole & Maxwell, 2003; Philippaers et al., 2016). For mediation, there should be a causal chain between X and M and between M and Y. With a two-wave data, these two causal chains can be tested separately, each time using the two measurement moments in the data set. So to establish a causal link between X and M, one would regress X at moment 1 on M at moment 2 (while taking into account autoregression). Similarly, to establish a causal link between M and Y, one would regress M at moment 1 on Y at moment 2 (while taking into account autoregression).

To assess whether such a model has a good fit with the data, and hence to probe the likelihood of causality, one needs to test whether alternative model specifications generate a worse fit with the data

than the model specification that assumes causality (Cole & Maxwell, 2003). Alternative model specifications include a reversed causation model, which on top of autoregressive effects specifies relationships that are reversed to the hypothesized relations. Another alternative model specification is a reciprocal model, which on top of autoregressive effects allows associations forward and backward between X, M and Y. In order to determine which model fits the data best, it is common to use fit indices, including CFI, TLI, the RMSEA and the SRMR. We also evaluated the Akaike information criterion (AIC) and the Bayesian information criterion (BIC). Comparing fit indices of several model specification will show whether the hypothesized path of causation is the best fit with the data.

4 | RESULTS

The means, standard deviations and correlations among all variables in our study are presented in Table 1. Demographic variables were not found to structurally associate with any of the main variables, indicated by all correlations being below .3. Beforehand, we expected that tenure and age may be positively associated with resilience, but this turned out not to be the case. Hence, we excluded these demographic variables from further analysis, thereby following recommendations by Bernerth and Aguinis (2016) about using control variables sparingly. Table 1 indicates that resilience and positive emotions show a relatively high stability over time, whereas idea generation, promotion and implementation show moderate stability. Idea generation, promotion and implementation each correlate positively with resilience and positive emotions at each time and across times.

Prior to the mediation analyses, we analysed a measurement model that specifies the relations between the observed and the latent construct variables. In this way, we can establish whether each measure loads on the intended factor (Byrne, 2013). Consistent with our expectations, all items loaded on the intended factor. Fit statistics showed an acceptable fit for the measurement model ($\chi^2 = 459.153$; $df = 260$; RMSEA = .06; CFI = .93; TLI = .92; SRMR = .06). A model grouping all measures into one factor showed a worse fit ($\chi^2 = 1434.103$; $df = 275$; RMSEA = .15; CFI = .57; TLI = .53; SRMR = .16).

We performed structural equations modelling by using the R-package Lavaan (Rosseel, 2012) to examine the hypothesized mediation effect. We performed a cross-lag analysis that allows testing partial mediation while adopting a two-wave design (Cole & Maxwell, 2003; Hakanen et al., 2008; Nikolova et al., 2019; Philippaers et al., 2016; Taris & Kompier, 2006). As recommended by Cole and Maxwell (2003), we tested two sets of cross-lagged analyses. Firstly, we tested for the causal relation between predictor and mediator variables. Secondly, we examined the causal relation between mediator and outcome variables.

In each analysis, we specified and compared several competing models. M_{stabil} refers to the stability model, which includes only autoregressive associations between each set of latent constructs and does not include any cross-lagged paths. M_{causal} refers to the causality

TABLE 1 Means, standard deviations and correlations

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Idea generating T1	4.47	1.10	(.87)												
2. Idea generating T2	4.48	1.06	.53**	(.85)											
3. Idea promotion T1	4.31	1.14	.72**	.44**	(.90)										
4. Idea promotion T2	4.33	1.15	.42**	.71**	.47**	(.91)									
5. Idea implementation T1	4.11	1.25	.69**	.45**	.74**	.44**	(.91)								
6. Idea implementation T2	4.24	1.17	.38**	.73**	.36**	.79**	.47**	(.91)							
7. Resilience T1	4.54	0.95	.29**	.22**	.34**	.26**	.32**	.23**	(.81)						
8. Resilience T2	4.64	0.98	.14*	.23**	.19**	.30**	.21**	.17*	.63**	(.82)					
9. Positive emotions T1	3.84	0.53	.35**	.31**	.42**	.32**	.29**	.22**	.37**	.29**	(.88)				
10. Positive emotions T2	3.85	0.53	.26**	.39**	.33**	.40**	.19**	.28**	.33**	.30**	.63**	(.88)			
11. Tenure	11.83	10.45	−.04	−.06	−.03	−.12	.01	−.10	.03	.07	.03	.06			
12. Age	46.25	12.25	−.06	−.14*	−.03	−.14	−.01	−.17*	.05	.08	.12	.02	.53**		
13. Education level	4.91	1.55	.21**	.11	.15*	.14*	.22**	.18*	.19**	.01	−.08	−.04	−.12	−.23**	
14. Gender	1.50	0.50	−.19**	−.11	−.18*	−.07	−.17*	−.05	−.19**	−.11	−.06	−.14	−.23**	−.08	.04

Note: M and SD are used to represent mean and standard deviation, respectively. Cronbach's alpha is between brackets on the diagonal. Bold is used to denote significant correlations. * $p < 0.05$, ** $p < 0.01$.

TABLE 2 Fit indices for the structural models—Idea generation

Model	Model description	χ^2	df	χ^2/df	p-value	RMSEA	CFI	TLI	AIC	BIC	SRMR	$\Delta\chi^2$
M _{dir}	Autoregressive paths and a direct path between resilience and idea generation	11.489	5	2.30	.042	.081	.977	.946	1182.379	1215.312	.054	
M _{stabil}	Autoregressive paths only	12.043	6	2.01	.061	.071	.979	.958	1180.933	1210.573	.059	
M1 _{causal}	Autoregressive paths and causal relationships between resilience and positive emotions	8.328	5	1.67	.139	.058	.988	.972	1179.218	1212.151	.047	M1 _{causal} – M1 _{stabil} 3.715 (p = .05)
M1 _{recipr}	Autoregressive paths and causal as well as reversed causal relationships between resilience and positive emotions	7.637	4	2.26	.106	.068	.987	.962	1182.179	1215.112	.044	M1 _{recipr} – M1 _{causal} 0.690 (p = .40)
M1 _{revers}	Autoregressive paths and reversed causal relationships between resilience and positive emotions	11.289	5	1.67	.046	.080	.978	.948	1179.218	1212.151	.055	M1 _{revers} – M1 _{recipr} 3.651 (p = .05)
M2 _{causal}	Autoregressive paths and causal relationships between positive emotions and idea generation	7.071	5	1.41	.215	.046	.993	.983	1177.961	1210.894	.038	M2 _{causal} – M2 _{stabil} 4.971 (p = .02)
M2 _{recipr}	Autoregressive paths and causal as well as reversed causal relationships between positive emotions and idea generation	6.102	4	1.53	.192	.051	.993	.978	1178.992	1215.219	.034	M2 _{recipr} – M2 _{causal} 0.968 (p = .32)

(Continues)

TABLE 2 (Continued)

Model	Model description	χ^2	df	χ^2/df	p-value	RMSEA	CFI	TLI	AIC	BIC	SRMR	$\Delta\chi^2$
M2 _{revers}	Autoregressive paths and reversed causal relationships between positive emotions and idea generation	10.669	5	2.13	.058	.075	.980	.953	1181.559	1214.492	.051	M2 _{revers} – M2 _{recipr} 4.567 ($p = .03$)

Note: Bold and italic is used to indicate optimal model specifications.

Abbreviations: AIC, Akaike information criterion; BIC, Bayesian information criterion; CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Tucker–Lewis index.

model, which includes autoregressive as well as causal relationships. M1_{causal} includes the causal path between resiliency and positive emotions, and M2_{causal} includes the causal path between positive emotions and idea generating behaviour. The reversed causation model, denoted by M_{revers}, includes autoregressive paths and the path with relationships that are reversed to the hypothesized relations. For M1_{revers}, the path between positive emotions and trait resilience is included, and for M2_{revers}, the path between idea generating behaviour and positive emotions is included. Finally, a reciprocal model, denoted by M_{recipr}, includes all associations as specified in the models M_{causal} and M_{revers}. That is, M1_{recipr} includes the associations of M1_{causal} and M1_{revers}, and M2_{recipr} includes the associations of M2_{causal} and M2_{revers}.

To assess model fit of each of the competitive model specifications, we examined diverse fit indices for evaluating goodness of fit in structural equations modelling, as recommended by Kline (2005). An acceptable fit is indicated by an SRMR value below .80 and an RMSEA value below .08 and values of CFI and TLI above .95 (Byrne, 2013; Kline, 2005). Lower values of AIC and BIC indicate better fits (Wilson, 2015). Table 2 shows the fit statistics of the competitive model specifications for idea generation behaviour.

Firstly, the results showed that the direct effect model, M_{dir}, with autoregressive associations and a direct path between trait resilience and idea generating behaviour fitted the data well ($\chi^2/\text{df} = 2.298$). Secondly, we compared alternative model specifications examining cross-lagged relations between trait resilience and positive emotions (Table 2). The causal model, M1_{causal}, showed a better fit ($\chi^2/\text{df} = 1.666$) to the data than the stability model, M1_{stabil} ($\chi^2/\text{df} = 2.007$), thereby demonstrating a causal relation between trait resilience at Time 1 and positive emotions at Time 2. The reversed causation model, M1_{revers}, showed a slightly worse fit ($\chi^2/\text{df} = 2.258$) compared with the stability model – M_{stabil} ($\chi^2/\text{df} = 2.007$) – and fitted the data not as well as the causal model, M1_{causal} ($\chi^2/\text{df} = 1.666$). Additionally, the reciprocal model demonstrated a better fit to the data ($\chi^2/\text{df} = 1.909$) than the stability model ($\chi^2/\text{df} = 2.007$). When considering the other fit indices (AIC, BIC, RMSEA, TFL and CFI), we see that the causal model, M1_{causal}, shows the best fit.

However, when we test whether models significantly differ from each other, we find that M1_{causal} does not significantly differ from M1_{recipr}, suggesting that both model specifications cannot be distinguished in terms of fit. Yet, a significant difference exists between M1_{revers} and M1_{recipr}. Taken together, this pattern of results indicates that the causal model, in which trait resilience at Time 1 predicts positive emotions at Time 2, as well as the reciprocal model, which allows positive emotions to feed back to trait resilience, are the models that best represent the data. There is no support for a model in which positive emotions at Time 1 predict trait resilience at Time 2 without allowing for a feedback loop. Furthermore, the p -values in Table 2 represent the probability that the observed and model-implied covariances substantially differ, which indicates that the model structure is not suited for gathering estimates from the data (Grace, 2020). In other words, p -values above .5 indicate an appropriate model structure, which is the case for the causal model, M1_{causal}, and the reciprocal model, M_{recipr}, but not for the reverse model, M_{revers}. Based on the p -value, the M1_{causal} model specification is slightly better than the one of M_{recipr}. Similar patterns of results are found when we look at the analyses for idea promotion behaviour (Table 3). For idea implementation behaviour (Table 4), we find that the reverse model has the best fit with the data. Appendix A shows the estimates for all specified paths in the tested model specifications. It shows that the estimate of the reverse path is not significant ($p = .242$). This pattern of findings suggests support for Hypothesis 1.

Furthermore, Table 2 indicates that the causal model between positive emotions and idea generating behaviour, M2_{causal}, also fits the data better ($\chi^2/\text{df} = 1.414$) than alternative model specifications, such as the stability model, M_{stabil} ($\chi^2/\text{df} = 2.007$), or the reversed model, M2_{revers} ($\chi^2/\text{df} = 2.134$). Chi-difference tests show that the reciprocal model, M2_{recipr} ($\chi^2/\text{df} = 1.526$), cannot statistically be distinguished from the causality model, M2_{causal}. This pattern of results indicates that there is a causal or reciprocal path from positive emotions to idea generating behaviour. The overview of path estimates in Appendix A indicates that the reciprocal path is not significant ($p = .323$). Yet, the estimate of the causal path is significant

TABLE 3 Fit indices for the structural models—Idea promotion

Model	Model description	χ^2	df	χ^2/df	p-value	RMSEA	CFI	TLI	AIC	BIC	SRMR	$\Delta\chi^2$
M _{dir}	Autoregressive paths and a direct path between resilience and idea generation	10.333	5	2.07	.066	.073	.981	.954	1224.842	1257.775	.054	
M _{stabil}	Autoregressive paths only	12.151	6	2.03	.059	.072	.978	.955	1224.660	1254.300	.063	
M1_{causal}	Autoregressive paths and causal relationships between resilience and positive emotions	9.018	5	1.80	.108	.064	.985	.965	1223.528	1256.461	.053	M1 _{causal} – M1 _{stabil} 3.132 (<i>p</i> = .07)
M1 _{recipr}	Autoregressive paths and causal as well as reversed causal relationships between resilience and positive emotions	8.344	4	2.09	.080	.074	.984	.953	1224.853	1261.080	.050	M1 _{recipr} – M1 _{causal} 0.674 (<i>p</i> = .41)
M1 _{revers}	Autoregressive paths and reversed causal relationships between resilience and positive emotions	11.435	5	2.29	.043	.080	.977	.944	1225.945	1258.878	.060	M1 _{revers} – M1 _{recipr} 3.091 (<i>p</i> = .07)
M2 _{causal}	Autoregressive paths and causal relationships between positive emotions and idea generation	7.671	5	1.53	.175	.052	.990	.977	1222.181	1255.114	.044	M2 _{causal} – M2 _{stabil} 4.479 (<i>p</i> = .03)
M2_{recipr}	Autoregressive paths and causal as well as reversed causal relationships between positive emotions and idea generation	5.758	4	1.44	.218	.047	.994	.981	1222.267	1258.494	.036	M2 _{recipr} – M2 _{causal} 1.913 (<i>p</i> = .16)

(Continues)

TABLE 3 (Continued)

Model	Model description	χ^2	df	χ^2/df	p-value	RMSEA	CFI	TLI	AIC	BIC	SRMR	$\Delta\chi^2$
M2 _{revers}	Autoregressive paths and reversed causal relationships between positive emotions and idea generation	9.639	5	1.93	.086	.068	.983	.960	1224.149	1257.082	.053	M2 _{revers} – M2 _{recipr} 3.881 ($p = .04$)

Note: Bold and italic is used to indicate optimal model specifications.

Abbreviations: AIC, Akaike information criterion; BIC, Bayesian information criterion; CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Tucker–Lewis index.

($p = .024$). Hence, the data suggest a causal relationship between positive emotions and idea generating behaviour.

Similar results are found when we look at the other output measures, that is, idea promotion (Table 3) and idea implementation behaviours (Table 4). With regard to idea promotion behaviour, the reciprocal model, M2_{recipr}, fits the data best, but this model specification cannot be statistically distinguished from the causal model, M2_{causal}. Yet, both models are statistically different from the reverse model, M2_{revers}, which has the worst fit. Appendix A indicates that a reciprocal path is not significant ($p = .165$), which supports our hypothesis of a causal relationship.

For idea implementation behaviour, the three model specifications cannot be statistically distinguished. When examining the path estimates in Appendix A, we see that the causal model is most convincing, having a significant path estimate for the causal relationship between positive emotions and idea implementation behaviour. Given these analyses, we conclude that Hypothesis 2 is supported specifically for idea generation and idea promotion behaviours, and with reasonable confidence also for idea implementation behaviour.

To provide insights in the relationships of the best fitting models for the set of cross-lagged analyses that pertain to idea generation, we present Figures 1–3. Figure 1 shows autoregressive and cross-lagged relations (M1_{causal}) between trait resilience at Time 1 and positive emotions at Time 2. In line with our expectation, trait resilience at Time 1 had a positive cross-lagged effect on positive emotions at Time 2 ($b = .06$, $p < .05$). Figure 2 shows autoregressive and cross-lagged relations (M2_{causal}) between positive emotions at Time 1 and idea generating behaviour at Time 2 ($b = .28$, $p < .05$), indicating that trait resilience predicts positive emotions, which in turn predict idea generating behaviour.

With regard to idea implementation behaviour, we refer to Appendix A, as the results are very similar to the findings for idea generation behaviour. Idea promotion shows another pattern though. Figure 3 shows autoregressive and cross-lagged relations (M2_{recipr}) between positive emotions at Time 1 and idea promotion behaviour at Time 2 ($b = .29$, $p < .05$). Figure 3 shows that positive emotions at Time 1 are significantly related to idea promotion at Time 2. Although

this model specification allows for a feedback mechanism from idea promotion back to positive emotions, this relationship is not significant.

In short, our two-phase cross-lagged analysis supports the expected mediated process from trait resilience via positive emotions to idea generation and idea promotion behaviours, thereby confirming Hypotheses 1 and 2. For idea implementation behaviour, the data suggest a similar conclusion, although the various model specifications cannot be statistically distinguished and therefore one should be cautious to draw bold conclusions. Following logical arguments in line with Taris and Kompier (2006) and Cole and Maxwell (2003), we can now conclude that Hypothesis 3 is confirmed as well, specifically for idea generation and idea promotion behaviours and most likely also for idea implementation behaviour.

5 | DISCUSSION

Our study is a first attempt to understand how personality in the form of resilience influences employees' innovative behaviour at work, defined as a set of behaviours consisting of idea generation, promotion and implementation behaviours. Drawing on control theory in conjunction with the affect-as-information perspective, we develop a mediation model in which positive emotions mediate the relationship between trait resilience and IWBs. We test our model using a unique sample of 199 working individuals from The Netherlands. The current study supported the presence of pathways between resilience and IWBs (idea generation, idea promotion and idea implementation) via positive emotions. As such, our study sheds light on the mechanism that induces resilient employees to display IWBs.

Building on established theory, one would not expect bidirectionality between trait resilience and positive emotions, or IWB. The resilience literature shows a distinction between trait resilience (which is relatively stable over time) and resilient behaviour (which reflects a capacity for behaving resiliently and which may increase over time) (Kuntz, Connell, et al., 2017; Kuntz, Malinen, et al., 2017). However, bidirectionality between positive emotions

TABLE 4 Fit indices for the structural models—Idea implementation

Model	Model description	χ^2	df	χ^2/df	p-value	RMSEA	CFI	TLI	AIC	BIC	SRMR	$\Delta\chi^2$
M _{dir}	Autoregressive paths and a direct path between resilience and idea generation	6.763	5	1.35	.239	.042	.993	.984	1245.441	1278.374	.041	
M _{stabil}	Autoregressive paths only	7.730	6	1.29	.259	.038	.993	.987	1244.408	1274.048	.048	
M1 _{causal}	Autoregressive paths and causal relationships between resilience and positive emotions	4.287	5	0.86	.509	.000	1.000	1.007	1242.966	1275.899	.035	M1 _{causal} – M1 _{stabil} 3.442 (<i>p</i> = .06)
M1 _{recipr}	Autoregressive paths and causal as well as reversed causal relationships between resilience and positive emotions	3.068	4	0.77	.546	.000	1.000	1.011	1243.747	1279.973	.031	M1 _{recipr} – M1 _{causal} 1.218 (<i>p</i> = .26)
M1 _{revers}	Autoregressive paths and reversed causal relationships between resilience and positive emotions	6.374	5	1.27	.272	.037	.995	.987	1245.052	1277.986	.042	M1 _{revers} – M1 _{recipr} 3.305 (<i>p</i> = .06)
M2 _{causal}	Autoregressive paths and causal relationships between positive emotions and idea generation	5.677	5	1.14	.339	.026	0.997	.994	1244.355	1277.288	.038	M2 _{causal} – M2 _{stabil} 2.053 (<i>p</i> = .15)
M2 _{recipr}	Autoregressive paths and causal as well as reversed causal relationships between positive emotions and idea generation	5.627	4	1.41	.229	.045	.994	.981	1246.305	1282.532	.037	M2 _{recipr} – M2 _{causal} 0.050 (<i>p</i> = .82)

(Continues)

TABLE 4 (Continued)

Model	Model description	χ^2	df	χ^2/df	p-value	RMSEA	CFI	TLI	AIC	BIC	SRMR	$\Delta\chi^2$
M2 _{revers}	Autoregressive paths and reversed causal relationships between positive emotions and idea generation	7.636	5	1.53	.177	.051	.990	.976	1246.314	1279.247	.047	M2 _{revers} – M2 _{recipr} 2.009 ($p = .15$)

Note: Bold and italic is used to indicate optimal model specifications.

Abbreviations: AIC, Akaike information criterion; BIC, Bayesian information criterion; CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Tucker–Lewis index.

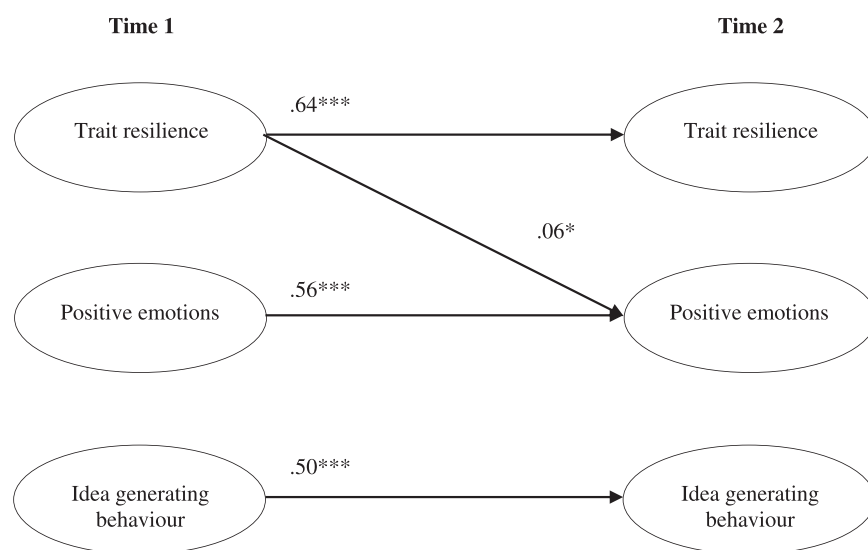


FIGURE 1 Causal model showing the cross-lagged relationship between trait resilience and positive emotions ($n = 199$). * $p < .05$, *** $p < .001$

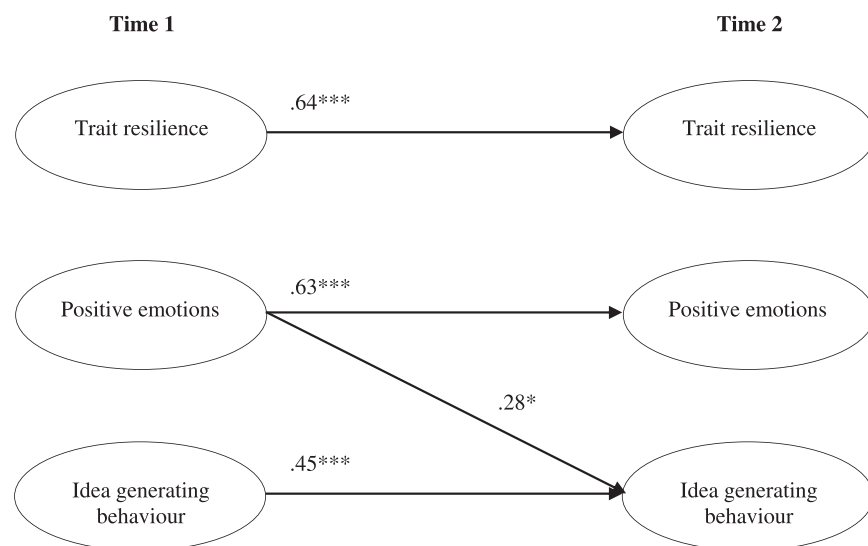
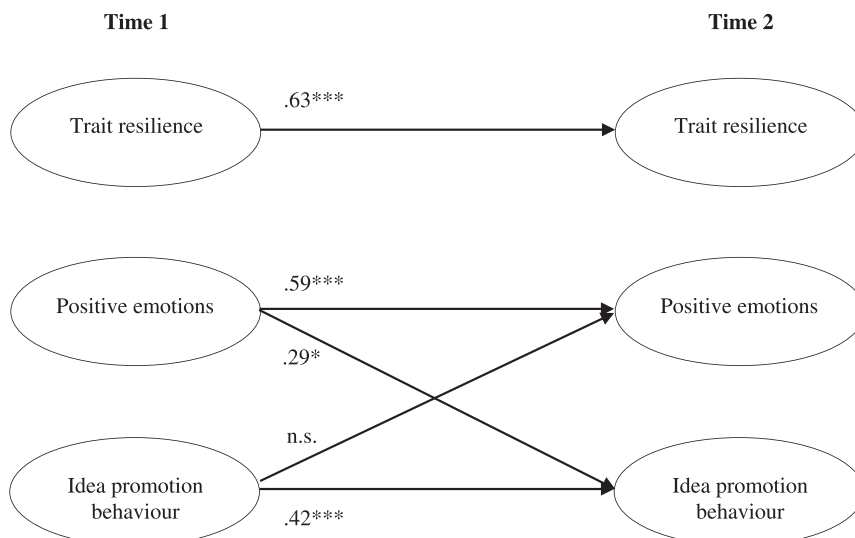


FIGURE 2 Causal model showing the cross-lagged relationship between positive emotions and idea generating behaviour ($n = 199$). * $p < .05$, *** $p < .001$

FIGURE 3 Reciprocal model showing the cross-lagged relationship between positive emotions and idea promotion ($n = 199$).
 $*p < .05$, $***p < .001$; n.s., not significant



and dimensions of IWB cannot immediately be ruled out. Given the affect-as-information perspective, it is unlikely that IWB will feedback into emotions, as emotions are the signal that trigger behaviour. However, in accordance with control theory, people who perform high in terms of IWB may experience positive emotions. IWB will reduce the discrepancy between a current state (having a problem that needs an idea to solve it) and a desired state (implementation of a solution for the problem), which may result in positive emotions. Although we hypothesized causal paths between trait resilience, positive emotions and the IWBs (on basis of the affect-as-information perspective), we also analysed reverse and reciprocal associations between the variables included in our study. We find that the causal models (M1_{causal} and M2_{causal}) better fit the data than the reverse or reciprocal models. Hence, our cross-lagged analyses probing causality suggest that having resilient employees pays off in terms of innovative behaviours. These results support the idea that emotions are crucial for translating innate resilience into idea generating behaviour, as resilience reduces the discrepancy between current and desired states, by fostering psychological safety, challenging goals and heuristic and creative processing strategies. Furthermore, our model and findings provide insight into the differential functioning of positive emotions regarding the varying dimensions of IWB.

5.1 | Theoretical implications

Our study has several implications for innovation theory and practice. First, we add to the literature by theoretically arguing for and empirically testing the psychological mechanism underlying the relationship between trait resilience and IWBs. This is important, because until now, studies that linked resilience to innovation have not considered mechanisms via which trait resilience could lead to innovative behaviour (e.g., Yu, Raphael, et al., 2019; Yu, Li, et al., 2019) or creativity (e.g., Cai et al., 2019; Fandiño et al., 2019; Sweetman et al., 2011). Previous studies have only implicitly assumed that the relationship

between employee resilience and positive organizational outcomes is largely explained by such mechanisms (e.g., Huang & Luthans, 2015). We still lack an integrative framework that connects these concepts and explicitly tests them. Our theoretical model, which is based on control theory in conjunction with an affect-as-information perspective, provides one possible valuable framework by highlighting the importance of employees experiencing a positive mood, such as feelings of joy, interest, enthusiasm or alertness. Consistent with studies that indicate a link between resilience and positive emotions (e.g., Cohn et al., 2009; Luthans et al., 2006), our results add to mood research by showing that trait resilience predicts positive emotions at work, which in turn predict IWB (as supported by the results from testing Hypotheses 1 and 2). Subsequently, the combination of pleasantness and activation makes resilience of employees more beneficial in terms of innovative behaviours at work. Whereas most studies that link emotions to innovation highlight effects for creative or innovative *performance* (e.g., Baas et al., 2008; De Dreu et al., 2008), our results add to these studies by demonstrating the positive effect of emotions on innovative *behaviour* at work.

Second, our study highlights the importance of examining differences between three dimensions of employee innovative behaviour, which cover the behavioural process of innovation at work: idea generation, idea promotion and idea implementation. Although prior studies have indicated that IWB can be conceived of as a multidimensional construct (Axtell et al., 2000; Janssen, 2000), empirical work linking emotions to behaviour has resorted to a general measure of IWB (e.g., Madrid et al., 2014). For example, Madrid et al. (2014) found a positive relationship between positive moods and IWB, which is consistent with our findings as well as extended by our findings about the influence of the separate dimensions of IWB. Although we hypothesized causal paths between trait resilience, positive emotions and idea generation, promotion and implementation behaviours, we also analysed reverse and reciprocal associations between the variables included in our study and find differences for different outcomes of interest. In this regard, our results imply that

predominantly, idea generation and idea promotion are induced by experiencing positive emotions, whereas the mechanism is much less clear when considering idea implementation behaviour. This may be explained by the affect-as-information perspective: Idea generation, also often referred to as creativity, refers to the production of novel and useful ideas (Amabile et al., 1996; De Jong & Den Hartog, 2010; Janssen, 2001), which requires a broad scope of attention and heuristic and creative processing strategies as stimulated by positive emotions. Idea promotion requires interaction, networking and social influence to move the generated ideas forward (Perry-Smith & Mannucci, 2017). This performance stage strongly relies on factors like psychological safety as signalled by positive emotions, which employees use as an indication that they can engage in proactive behaviours. Our findings suggest that idea promotion behaviours during the process of convincing stakeholders are fuelled by positive emotions. In turn, implementing ideas requires that an idea gets more tangible, thus being accepted and adopted by the organization. Not surprisingly, then, the implementation of ideas is considered the biggest challenge of innovation management. Implementation requires more structure and more resources than idea generation and promotion behaviours, and hence, other factors, for example, budget and time, may be of greater importance. Indeed, research findings by Mascareño et al. (2021) suggest that idea implementation requires more of a focus on usefulness and feasibility, whereas idea generation and idea promotion may be more focused on novelty. Or as Van Hootegeem et al. (2019, p. 25) concluded based on their empirical findings: 'Transforming the idea into something concrete might be a cognitive process which requires concentration and attention'. This may explain why the role of positive emotions for idea implementation does not come forward from our analyses.

Finally, ancillary to our theoretical contributions, we contribute to existing studies in terms of our study design and methodology. Although several studies have linked resilience to emotions (e.g., Tugade & Fredrickson, 2007), or emotions to creative and innovative behaviour (George & Zhou, 2007; Hennessey & Amabile, 2010; Madrid et al., 2014), not much is known about the direction of causality of this relationship. Prior studies linking resilience to innovation have mainly used cross-sectional research designs (e.g., Cai et al., 2019; Fandiño et al., 2019; Sweetman et al., 2011; Yu, Raphael, et al., 2019; Yu, Li, et al., 2019), which can only infer correlation, and not causality. Alternatively, experimental designs have been used (Tugade & Fredrickson, 2007), but these often have limited sample populations, have limited external validity (laboratory experiments) or imperfect control (field studies). When using cross-sectional data, the independent and dependent variables are measured at the same time. Hence, it is only possible to infer correlation, not causation. When using two measurement points and assessing the independent variable earlier in time than the dependent variable, we can still only infer correlation, because the dependent variable could have changed over time on its own account and not because of variation in the independent variable. Therefore, it is needed to control for the autoregressive effect, that is, the value of the dependent variable when measured at the first measurement point. In this way, it can be

checked whether the variation in the independent variable at the first measurement point is correlated to the *change* of the dependent variable over time. If so, this would suggest causation. Currently, this type of analysis is not yet standard practice in innovation research. We hope that our study inspires researchers to include autoregressive effects in their analyses. Moreover, our study advances the literature about innovation and creativity by adopting a cross-lagged design, which allows us to consider alternative model specifications and controlling for autoregressive effects (Cole & Maxwell, 2003). By using cross-lagged analyses, we can probe causality in the relationships from trait resilience to IWBs via positive emotions. In our study, we have examined reverse and reciprocal relationships between the independent and dependent variables. Based on these analyses, we can conclude that the causal mechanism that we induce from theory does actually explain the relationship best. We can now rule out a reverse effect from positive emotions to resilience and also from innovative behaviours (specifically, idea generation and idea promotion) to positive emotions.

5.2 | Implications for practice

Our theoretical development and empirical findings are also relevant for practice. Organizations interested in bolstering their employees' IWB should not only hire and retain resilient employees but should also invest in their employees' resilience. Resilience is a multifaceted trait that has state-like characteristics, and hence, it can be gradually developed and be improved over time (Caniëls & Baaten, 2019; Luthans, 2002; Xanthopoulou et al., 2009). Developmental human resource practices may be directed at identifying and nurturing resilience qualities within employees and influence them by specifically designed interventions (Bardoel et al., 2014). For example, human resource interventions may be developed that provoke development in employees' resilience trait and consequently positive emotions and idea generation. Especially well-suited for this purpose may be interventions that construe social identities (Lodi-Smith & Roberts, 2007; Roberts & Wood, 2006). Prior research has shown that interventions that change how individuals interpret their social identities can instigate changes in traits (Lodi-Smith & Roberts, 2007; Roberts & Wood, 2006). In other words, interventions that make employee see themselves as 'resilient' may generate changes in trait resilience and behaviour (Lodi-Smith & Roberts, 2007; Roberts & Wood, 2006). Connor and Davidson (2003) show that with 'contemporary resilience interventions', an organization can identify and nurture resilience qualities within individuals (see also Rak, 2002). These resilient qualities will feed into the IWBs of employees and in this way stimulate the creative and innovative performance of organizations.

As our study highlights the importance of positive emotions for idea generation and promotion, managers may want to stimulate a positive organizational climate that instigates positive feelings among employees. For instance, organizational climates that are oriented on learning from errors and stimulating a growth mindset in employees have been found to encourage work-related flow experiences and

thereby positive emotions (Caniëls et al., 2020; Losada & Heaphy, 2004). In a similar vein, scholars in the area of organizational learning have pointed out that an organizational climate that harbours continuous improvement mechanisms such as, for instance, an open discussion of issues and problems may reduce the emotional impact of errors and failure (Keith & Frese, 2005; Van Dyck et al., 2005). To this end, developmental human resource practices may be directed at encouraging a positive organizational climate that endorses learning from mistakes. One can think of human resource practices that target the provision of learning opportunities and training sessions about non-threatening peer feedback.

5.3 | Limitations and future research

The results of this research have to be assessed in the light of several limitations, which harbour suggestions for future research. The first limitation pertains to our sample, which consists of employees from various Dutch organizations. Although we were primarily interested in the level of IWB that employees displayed in doing their regular tasks at work, it would have been interesting to control for whether employees were expected and required to be creative in their job (Unsworth & Clegg, 2010). We expect that positive emotions will be especially relevant for employees with a job that requires them to be creative and generate ideas as this group of employees is likely to regularly face adversity and disappointment when they advance by trial and error. Future studies may want to include creative requirement as a variable and assess whether our model is robust when one controls for creative requirement.

Secondly, in our survey, we asked respondents about their emotions at work during the past month. Yet, it is difficult for respondents to assess their emotions in hindsight. Future research may adopt a design in which daily, or hourly, measures of positive emotions can be captured, for instance, by using certain dedicated mobile-phone applications. Also, heart rate monitors could provide insight into emotional states of respondents. Data from such research designs will be better suited to gauge an employee's emotional state and link this to activities. Relatedly, we measured positive emotions, but not negative emotions. In an overview study, Lyubomirsky et al. (2005) argue that the presence of positive emotions is more important than the absence of negative emotions for successful outcomes. Still, future research may want to address how negative emotions, connected to setbacks at work, are related to idea generating behaviour. Additionally, in emotion, research pleads for assessing discrete emotions instead of relying on broad dimensions of affect (e.g., Harmon-Jones et al., 2016). Future research could exploit this idea by distinguishing the effect of distinct emotions on innovative behaviour at work. In this way, innovation research can gain insights on the psychological mechanisms that induce employees' creativity and innovativity at work.

Thirdly, we used self-reported measures, which could lead to concerns for common method bias. Although Spector (2006) is critical about the concern for common method bias, we choose to minimize

the risk by undertaking several remedial procedures in our research design, following Podsakoff et al. (2003). Most importantly, we gathered data of our dependent variable at a later moment in time (Time 2) than we collected data on predictor and mediating variables (Time 1). We recommend that future studies develop alternative research designs to further limit risks on bias. For instance, leader ratings and peer ratings could be used to complement the self-assessment of IWB at different moments in time.

Fourthly, we used a two-wave design to test a mediation model, by following the method explained in Cole and Maxwell (2003) and Taris and Kompier (2006), which explain how to examine sets of cross-lagged relationships in a full panel design. Although a two-wave study is preferable to a cross-sectional design, we can only provide evidence of causality, but we cannot offer absolute proof. Future studies may want to test the robustness of our proposed model in a three-wave design. Additionally, future research should acknowledge that cross-lagged models are no panacea and should only be used when they fit the conceptual model and the data. Hamaker et al. (2015) demonstrate that a cross-lagged model fails to adequately capture effects in stable variables, which can be the case in the context of within-person studies of stable traits. Researchers are advised to thoroughly inform themselves about the approach that best suits their specific research objective.

Notwithstanding these limitations, we feel that our study and its findings have advanced current insights about how trait resilience at work contributes to idea generation behaviour.

DATA AVAILABILITY STATEMENT

Authors elect to not share data.

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APPENDIX A: ESTIMATES FOR ALL SPECIFIED PATHS IN THE TESTED MODEL SPECIFICATIONS

	Idea generation		Idea promotion		Idea implementation	
	Estimate	<i>p</i> -value	Estimate	<i>p</i> -value	Estimate	<i>p</i> -value
M1_{causal}						
X1 → X2	.64	.00	.63	.00	.65	.00
X1 → M2	.06	.05	.06	.07	.06	.06
M1 → M2	.56	.00	.56	.00	.57	.00
Y1 → Y2	.50	.00	.46	.00	.44	.00
M1_{recipr}						
X1 → X2	.62	.00	.61	.00	.62	.00
M1 → X2	.09	.40	.09	.41	.12	.26
X1 → M2	.06	.05	.06	.08	.06	.06
M1 → M2	.56	.00	.57	.00	.58	.00
Y1 → Y2	.51	.00	.47	.00	.44	.00
M1_{revers}						
X1 → X2	.61	.00	.67	.00	.61	.00
M1 → X2	.09	.38	.09	.39	.13	.24
M1 → M2	.60	.00	.60	.00	.62	.00
Y1 → Y2	.50	.00	.46	.00	.44	.00
M2_{causal}						
X1 → X2	.64	.00	.63	.00	.64	.00
M1 → M2	.63	.00	.62	.00	.63	.00
Y1 → Y2	.45	.00	.40	.00	.21	.15
M1 → Y2	.28	.02	.31	.03	.41	.00
M2_{recipr}						
X1 → X2	.64	.00	.63	.00	.64	.00
M1 → M2	.61	.00	.59	.00	.62	.00
Y1 → M2	.03	.32	.04	.16	.01	.82
Y1 → Y2	.47	.00	.42	.00	.42	.00
M1 → Y2	.27	.03	.29	.04	.21	.15
M2_{revers}						
X1 → X2	.63	.00	.63	.00	.64	.00
M1 → M2	.57	.00	.56	.00	.61	.00
Y1 → M2	.03	.24	.04	.11	.01	.75
Y1 → Y2	.51	.00	.48	.00	.44	.00