

## Nostalgia promotes intrinsic motivation and effort in the presence of low interactional justice



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### ABSTRACT

We examined whether nostalgia increases intrinsic motivation in situations of low (vs. high) interactional justice, with downstream implications for work effort. In Study 1, we tested employees of various organizations using experience sampling methodology (ESM). High (vs. low) momentary nostalgia predicted stronger momentary intrinsic motivation, particularly when chronic interactional justice was low (vs. high). In Study 2, another ESM study among employees, we induced nostalgia. Induced nostalgia (vs. control) strengthened momentary work effort, via momentary intrinsic motivation, when chronic interactional justice was low (vs. high). This effect emerged for organizational and personal nostalgia. In Study 3, an experiment, we induced nostalgia and interactional justice. Induced nostalgia (vs. control) increased intrinsic motivation among participants experiencing low (vs. high) interactional justice. This effect of nostalgia was mediated by past-self directedness. In the face of low interactional justice, nostalgia makes employees experience their work as pleasant and motivating, leading them to exert more work effort.

Scholars within the management and organizational sciences have increasingly been concerned with the study of emotions (Colquitt et al., 2013; Elfenbein, 2007; Gooty, Connelly, Griffith, & Gupta, 2010). However, the emotion of nostalgia, defined in *The New Oxford Dictionary of English* as “a sentimental longing or wistful affection for the past” (Pearsall, 1998, p. 1266), has been virtually absent from the relevant literatures (for an exception, see: Van Dijke, Wildschut, Leunissen, & Sedikides, 2015). This is so despite early calls to the contrary (Gabriel, 1993) and emerging evidence for nostalgia’s psychological utility. Indeed, nostalgia confers psychological benefits and offsets threat. For example, it strengthens self-positivity and social connectedness (i.e., a sense of acceptance and belongingness), and it counteracts various types of threat, such as self-threat (e.g., negative performance feedback) and social threat (e.g., compromised social connectedness; Sedikides, Wildschut, Arndt, & Routledge, 2008; Sedikides et al., 2015).

In the present article, we address how nostalgia increases employees’ intrinsic motivation, with downstream implications for work effort. Intrinsic motivation refers to the curious and exploratory engagement in activities that individuals find inherently interesting and enjoyable (Deci, Connell, & Ryan, 1989). This kind of motivation is of great relevance to

organization scholars, because intrinsically motivated individuals are more happy, persistent, focused, cognitively flexible, productive, and creative than extrinsically motivated ones (i.e., those motivated by rewards for desirable behavior and/or punishment of undesirable behavior; Cerasoli, Nicklin, & Ford, 2014; Deci & Ryan, 2000; Vallerand, 1997). Intrinsic motivation is therefore a key concept in various research traditions or theories, such as achievement motivation (Elliot & Harackiewicz, 1996), self-determination theory (Gagné & Deci, 2005), flow (Csikszentmihalyi, 1990), and empowerment (Spreitzer, 2008). Although these literatures differ in emphasis, they converge on the notion that intrinsic motivation flourishes in challenging contexts (i.e., where one’s resources just outweigh situational demands), because such contexts allow for personal qualities to come to the fore (i.e., self-expression). Conversely, intrinsic motivation is undermined in threatening contexts (i.e., where situational demands outweigh one’s resources), because such contexts stifle self-expression (Chirkov, Ryan, Kim, & Kaplan, 2003; Covington & Müeller, 2001; Keller & Bless, 2008; Rawsthorne & Elliot, 1999). We argue that nostalgia stimulates intrinsic motivation, as it facilitates self-expression. Furthermore, we argue that this effect of nostalgia is pronounced in circumstances that hinder self-expression, namely, threatening circumstances.

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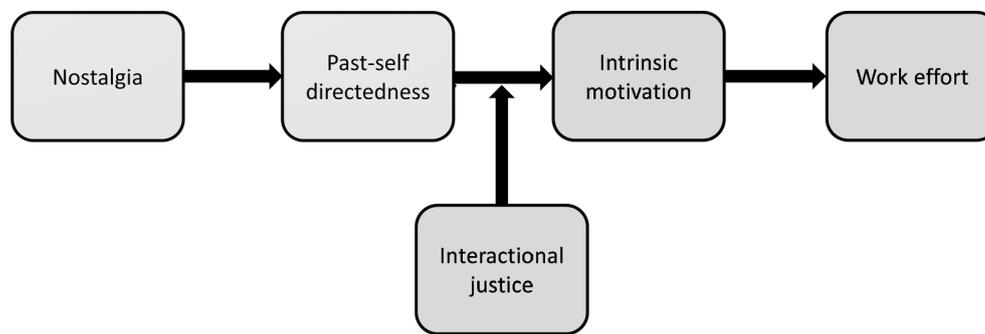


Fig. 1. The effect of nostalgia on work effort, as mediated by past-self directedness and intrinsic motivation, and moderated by interactional justice.

To test our argument, we focus on the threatening circumstance of being the victim of disrespectful, impolite, or untruthful treatment by organizational authorities—that is, being managed with low interactional justice. Low (vs. high) interactional justice decreases employee wellbeing (e.g., negative affect or stress, lower positive affect) and precipitates job dissatisfaction. Additionally, low (vs. high) interactional justice curtails organizational citizenship behavior (OCB) and in-role performance, and predicts destructive responses such as withdrawal, retaliation, or organizational exit (Cohen-Charash & Spector, 2001; Colquitt et al., 2013; Colquitt, Conlon, Wesson, Porter, & Ng, 2001). Low interactional justice reflects social threat in organizations. Similar to social undermining (Duffy, Ganster, & Pagon, 2002), abusive supervision (Tepper, 2000), derogation (Sedikides & Campbell, 2017), bullying (Hoel & Cooper, 2001), and tyranny (Ashforth, 1994), low interactional justice represents leader mistreatment (Mayer, Thau, Workman, Van Dijke, & De Cremer, 2012). Also, together with low procedural and distributive justice (two other types of social threat, albeit far less common than low interactional justice; Bies, 2001, 2005; Mikula, Petri, & Tanzer, 1990), low interactional justice constitutes an integral element of organizational injustice. Notwithstanding subtle differences among the abovementioned social threats, all involve employees' perceptions of being treated as unworthy and devalued organization members, and all engender consequences for employee wellbeing, OCB or in-role performance, and other responses that parallel those of low interactional justice (Aquino & Thau, 2009; Cohen-Charash & Spector, 2001; Colquitt et al., 2001, 2013).

We propose a theoretical model according to which nostalgia increases employees' intrinsic motivation, particularly in contexts of low (vs. high) interactional justice, with downstream implications for work effort (Fig. 1). We test this model in three studies. In Study 1, using experience sampling methodology (ESM), we examine whether spontaneously activated nostalgia predicts elevated intrinsic motivation, particularly among organization members experiencing low (vs. high) interactional justice. In Study 2, also using ESM, we examine whether experimentally induced nostalgia increases intrinsic motivation during the day among organization members experiencing low (vs. high) interactional justice. We further test whether, in turn, this heightened intrinsic motivation predicts increased work effort. As in Study 1, we expect that the path from high (vs. low) nostalgia to heightened intrinsic motivation will be stronger when interactional justice is low (vs. high). In Study 3, a laboratory experiment, we manipulate nostalgia and interactional justice, and examine whether nostalgic recollections heighten intrinsic motivation because they enhance past-self directedness. We expect that the path from past-self directedness to intrinsic motivation will be stronger among participants experiencing low (vs. high) interactional justice.

### 1. Nostalgia and intrinsic motivation

Nostalgia is a self-relevant yet intensely social, and ambivalent yet predominantly positive, emotion. Nostalgic recollections typically

involve valued events from one's past—fond, personally meaningful episodes pertaining to one's childhood or close relationships. In nostalgic reverie, one often views the recollection through rose-tinted glasses, misses the relevant person(s) or time, and may yearn to return to the past. As a result, one feels sentimental, most often content but with a tinge of longing (Hepper, Ritchie, Sedikides, & Wildschut, 2012; Sedikides & Wildschut, 2016). Nostalgia occurs relatively frequently (e.g., about 3 times a week in a sample of university students; Wildschut, Sedikides, Arndt, & Routledge, 2006) and is experienced by persons of all ages (Stephan et al., 2014; Zhou, Sedikides, Wildschut, & Gao, 2008) and across cultures (Hepper et al., 2014; Zou, Wildschut, Cable, & Sedikides, 2018). Employees' spontaneous nostalgic recollections do not typically reflect the organization that they work or have worked in, or experiences with colleagues or supervisors (i.e., 14% of nostalgic recollections in Study 2, this research, described such experiences). However, when prompted, employees readily provide nostalgic recollections that refer to past organizational events or actors (Leunissen, Sedikides, Wildschut, & Cohen, 2018).

Nostalgic recollections go “back to the roots.” That is, they give access to one's core and authentic self-attributes (Baldwin, Biernat, & Landau, 2015; Stephan, Sedikides, & Wildschut, 2012; see also: Sedikides, Slabu, Lenton, & Thomaes, 2017) and, by so doing, may foster intrinsic motivation. Relatedly, Davis (1977, p. 41) used a pecuniary analogy to describe how, by directing attention to foundational experiences, nostalgia increases resilience to current psychological threats. Nostalgia, he noted, “reassures us of past happiness and accomplishment; and, since these still remain on deposit, as it were, in the bank of our memory, it simultaneously bestows upon us a certain worth, irrespective of how present circumstances may seem to question or obscure this.” Indeed, salient autobiographical memories influence the current self-concept (Conway, 2005; Skowronski, Sedikides, Xie, & Zhou, 2015; Wilson & Ross, 2003). Expressing one's core and authentic self-attributes involves engaging in behaviors that interest one and that stem from internalized values and beliefs; in other words, it involves intrinsically motivated behavior (Ryan & Deci, 2000). Thus, by facilitating access to one's core and authentic attributes, nostalgia may promote intrinsic motivation. Indirect support for this argument is found in research showing that nostalgic individuals express being more interested in unfamiliar experiences (Iyer & Jetten, 2011), express openness to experience (Van Tilburg, Sedikides, & Wildschut, 2015) and curiosity (Baldwin & Landau, 2014), are determined to pursue their important goals (Abeyta, Routledge, & Juhl, 2015; Sedikides et al., 2018), and express lowered concerns with meeting external standards (Baldwin et al., 2015).

The pivotal role of core and authentic attributes in the experience of nostalgia suggests that the emotion will stimulate intrinsic motivation particularly when individuals feel unable to express these self-attributes due to constraining or threatening circumstances (Baldwin et al., 2015; Lenton, Bruder, Slabu, & Sedikides, 2013; Sedikides, Lenton, Slabu, & Thomaes, 2018). Below, we propose that nostalgia promotes intrinsic motivation under the threatening condition of low (vs. high) interactional justice.

## 2. Interactional justice

Interactional justice refers to the interpersonal side of organizational practices, that is, interpersonal treatment and communication by organizational authorities (Bies, 2005). It refers, specifically, to the respect, honesty, and politeness with which supervisors treat employees (Bies & Moag, 1986; Tyler & Bies, 1990). Low interactional justice is a threat to employees. They interpret disrespectful and dishonest treatment as devaluation of their organizational contribution (Berger, Ridgeway, Fisek, & Norman, 1998), thus feeling socially disconnected, if not incompetent (Mayer et al., 2012; Sedikides, Hart, & De Cremer, 2008; van Dijke, De Cremer, Mayer, & Van Quaquebeke, 2012).<sup>1</sup> Given that threats undermine intrinsic motivation (Chirkov et al., 2003; Covington & Müeller, 2001; Keller & Bless, 2008; Rawsthorne & Elliot, 1999), low (vs. high) interactional justice may undermine this type of motivation as well.

There is indeed indirect evidence that low (vs. high) interactional justice undermines intrinsic motivation (but see Zapata-Phelan, Colquitt, Scott, & Livingston, 2009). Low (vs. high) interactional justice decreases trust in the supervisor and the organization, commitment to the organization, and job satisfaction. Furthermore, it undermines in-role performance and OCB (Cohen-Charash & Spector, 2001; Colquitt et al., 2001, 2013). OCB refers to various types of discretionary or extra-role performance that contribute to effective organizational functioning but are not explicitly tied to rewards, such as helping one's coworkers and speaking up to improve the way in which work is organized (Organ, 1988). Intrinsic motivation positively influences performance, and particularly performance that is not directly tied to formal rewards (Cerasoli et al., 2014). In all, low (vs. high) interactional justice may undermine intrinsic motivation.

As noted, due to its self-expressive function, nostalgia may preserve intrinsic motivation in threatening situations that curtail self-expression (Baldwin et al., 2015; Stephan et al., 2012). Laboratory findings have established that nostalgia acts to offset threat. Induced nostalgia weakens death-thought accessibility and heightens meaning in life in situations of high (vs. low) mortality salience (Juhl, Routledge, Arndt, Sedikides, & Wildschut, 2010; Routledge, Arndt, Sedikides, & Wildschut, 2008), lowers defensive responding after a meaning threat (Routledge et al., 2011; Sedikides & Wildschut, 2017), increases prosocial behavior following a belongingness threat (Van Dijke et al., 2015), and reduces self-serving attributions in the wake of failure (vs. success) feedback (Vess, Arndt, Routledge, Sedikides, & Wildschut, 2012). Extending these lines of inquiry, we argue that nostalgia bolsters intrinsic motivation when self-expression is constrained, as in contexts characterized by low (vs. high) interactional justice. Put differently, nostalgia and high (vs. low) interactional justice arguably both facilitate intrinsic motivation by enabling self-expression; thus, being high on one of these two variables should be sufficient to produce high intrinsic motivation (Howell, Dorfman, & Kerr, 1986). Therefore, the effect of nostalgia on intrinsic motivation should be most pronounced when intrinsic motivation is low (rather than high). This argument culminates in our first hypothesis:

*High (vs. low) nostalgia leads to stronger intrinsic motivation, particularly in contexts of low interactional justice (H1).*

A corollary of H1 is that, by fostering self-expression, nostalgia mitigates the negative impact of low (vs. high) interactional justice on

<sup>1</sup> Interactional justice includes informational justice and interpersonal justice (Colquitt, 2001; Greenberg & Cropanzano, 1993). This differentiation acknowledges that the truthfulness and honesty of communication (i.e., informational justice) is distinct from its respectfulness and politeness (i.e., interpersonal justice). Although researchers often distinguish between these components, we followed Colquitt (2012) advice to strive for parsimony and thus focus on the overall concept of interactional justice when the theoretical argument does not offer unique predictions for interactional and informational justice.

intrinsic motivation. That is, the association between low (vs. high) interactional justice and reduced intrinsic motivation will be weaker among employees who experience high (vs. low) nostalgia.

*Corollary: The effect of low (vs. high) interactional justice in reducing intrinsic motivation is weaker when nostalgia is high (vs. low).*

Furthermore, intrinsic motivation affects organizational outcomes. We focus in this article on the outcome of work effort. Work effort predicts individual (Brown & Peterson, 1994) and organizational (Becker, Huselid, Pickus, & Spratt, 1997) performance. If nostalgia strengthens intrinsic motivation, particularly in contexts of low (vs. high) interactional justice, it may also promote work effort. Individuals who find a task more intrinsically motivating will, as a consequence, expend a higher degree of effort (Lawler & Hall, 1970; Simons, Dewitte, & Lens, 2004). Based on these findings, we argue that nostalgia intensifies work effort particularly in contexts of low (vs. high) interactional justice, via the mediating mechanism of heightened intrinsic motivation. This argument culminates in our second hypothesis (Fig. 1):

*High (vs. low) nostalgia leads to more work effort via the mediating mechanism of heightened intrinsic motivation. This indirect effect is stronger when interactional justice is low (vs. high), because the path from high (vs. low) nostalgia to intrinsic motivation is stronger when interactional justice is low (vs. high) (H2).*

## 3. Past-self directedness and nostalgia

Finally, we test *why* nostalgia augments intrinsic motivation in the presence of low interactional justice. We argue that, by going “back to the roots,” nostalgia may shape current intrinsic motivation. Specifically, we contend that nostalgia induces past-self directedness, a focus on past experiences involving the self. Past-self directedness, in turn, augments intrinsic motivation in situations of low (vs. high) interactional justice.

In developing our rationale, we draw on the Self Memory System model (SMS) (Conway, Singer, & Tagini, 2004), according to which autobiographical memories consist of two components: episodic memory and the long-term self. Most episodic memories are not retained in the long-term self, as they serve to keep track of short-term and goal-relevant activities (e.g., remembering that one has locked the door after leaving the house). Some episodic memories, however, will be retained in the long-term self:

“During the course of a day many episodic records will be formed by the working self and many of these will remain available to recall for short periods of time. Possibly many are lost during a sleep cycle with only some, because of their goal-relevance, being retained for longer periods of time during which they are slowly integrated with autobiographical memory” (Conway et al., 2004, p. 496).

Hence, memories relevant for the long-term self are particularly likely to be integrated into it. Further, integrated memories are more past-self directed than non-integrated episodic memories.

To summarize, nostalgic memories reflect feelings and beliefs about one's authentic attributes that are integrated in the long-term self. Nostalgic memories should therefore reflect more past-self directedness than ordinary episodic memories. This past-self directedness should, in turn, facilitate intrinsic motivation in contexts of low interactional justice. As noted, prior theory and evidence indicates that intrinsic motivation suffers when situational demands outweigh one's resources (i.e., threatening circumstances; Keller & Bless, 2008). Being past-self directed, which reflects access to the long-term self, should increase an individual's current resources, thus making the current situation less threatening. We argue, then, that past-self directedness and high (vs. low) interactional justice both increase intrinsic motivation by enabling self-expression; thus, being high on one of these two variables should be sufficient to produce high intrinsic motivation (Howell et al., 1986). As a consequence, the effect of past-self directedness on intrinsic motivation should be mostly visible in the face of low (vs. high) interactional justice.

**Table 1**  
Descriptive statistics, within- and between-person correlations, reliabilities, and correlations, Study 1.

Variables	<i>M</i>	<i>SD</i>	$\alpha/r$	1	2	3	4
1. Nostalgia <sup>a</sup>	2.48	1.52	0.89	–	0.09 (0.006)	0.01 (0.734)	
2. Intrinsic motivation <sup>a</sup>	4.83	1.45	0.96	0.10 (0.274)	–	0.43 (0.429)	
3. Positive affect <sup>a</sup>	3.69	0.83	0.89	0.87 (0.872)	0.53 (< 0.001)	–	
4. Interactional justice <sup>b</sup>	3.84	0.74	0.93	–0.19 (0.034)	0.40 (< 0.001)	0.27 (0.002)	–

Notes. Means and standard deviations for the within-person variables are based on the uncentered scores. Correlations below the main diagonal are between-person correlations (i.e., within-person variables averaged at the between-person level;  $N = 128$ ). Correlations above the main diagonal are within-person correlations ( $N = 1012$ ). *p* values in parentheses.

<sup>a</sup> Within-person (level 1) variable.

<sup>b</sup> Between-person (level 2) variable.

Study 3 examined whether nostalgic recollections (relative to recollections of ordinary experiences) are more past-self directed and, specifically, whether the beneficial effect of nostalgia on intrinsic motivation (in the presence of low interactional justice) would be mediated by past-self directedness. Our argument is summarized in Fig. 1 and culminates in Hypothesis 3:

*The positive effect of high (vs. low) nostalgia on intrinsic motivation (in contexts of low interactional justice) is mediated by past-self directedness (H3).*

#### 4. Study 1

In Study 1, relying on employees from various organizations, we first assessed chronic interactional justice. Following a week-long delay, we measured momentary (i.e., daily) nostalgia, intrinsic motivation, and positive affect (as control variable) on each work day for two work weeks. The design allowed us to test H1 and its corollary. Specifically, we assessed whether elevated levels of daily nostalgia predict heightened daily intrinsic motivation particularly in contexts of low (vs. high) chronic interactional justice.

##### 4.1. Method

###### 4.1.1. Sample

We collected the data via a professional Dutch research agency, Flycatcher, which boasts the ISO-26362 certification for access panels. This certification meets the quality requirements of the International Organization for Standardization in regards to social scientific research, market research, and opinion polls. Flycatcher has a membership of approximately 16,000 Dutch citizens. In return for their voluntary involvement as research participants, panel members are rewarded with points that can be converted into vouchers of their choice (e.g., cinema tickets).

We recruited individuals who were employed full-time in organizations (i.e., not self-employed) and who had regular working hours (i.e., between 8:00 am and 6:00 pm). No clear guidelines for sample size are available, but researchers have proposed a minimum of 50 participants (i.e., level 2 units) for testing cross-level interaction effects (Hox, 2010). Because this is the first investigation on the topic, and to anticipate response attrition, we opted for a larger sample. A total of 146 persons (92 men, 54 women), employed in a variety of companies, agreed to participate. We asked them to complete a daily survey on each of 10 workdays. We collected 1012 daily surveys (69% response rate), nested within 146 participants. Of these, 35 completed all 10 surveys (34.6%) and 134 (92%) completed at least 5 of the 10 surveys. Participants' age ranged from 23 to 63 years ( $M = 38.88$ ,  $SD = 10.57$ ). Fifteen percent of them had completed secondary education only, 24% subsequent vocational training, 33% a Bachelor's degree, and 29% a Master's degree. Organizational tenure ranged from 0 to 46 years ( $M = 9.61$  years,  $SD = 9.25$ ). Sixty-one percent of participants did not have a managerial role in their organization, 16% had a line

management position, 18% had a middle management position, and 5% held a senior management position.

###### 4.1.2. Procedure and measures

We collected two types of data (see Table 1 for scale statistics and correlations). First, we assessed chronic *interactional justice* using Colquitt (2001) 9-item scale, with each item preceded by the stem: "The following items are about your supervisor." Sample items are: "Has he/she treated you in a polite manner?", "Has he/she been candid in his/her communications with you?" (1 = *strongly disagree*, 5 = *strongly agree*). We averaged responses into an index. In the same session, we also assessed demographic variables.

A week later, and for each of 10 consecutive workdays, we sent participants a text message at a random time between the start (8:00 am) and the end (6:00 pm) of their workday, asking them to complete measures on their smartphone as soon as possible. ESM is used to measure momentary states (i.e., how one feels right now) rather than summary responses of a longer period (e.g., how one had felt over the past week, or in general). Based on recommendations (Bolger, Davis, & Rafaeli, 2003) and common practice in ESM research, we introduced the momentary measures (i.e., of nostalgia, intrinsic motivation, and positive affect) with: "At the moment of receiving the text message, how did you feel about your work?"

We measured momentary *nostalgia* with a 2-item scale (Hepper et al., 2012; Wildschut et al., 2006; Wildschut, Sedikides, Routledge, Arndt, & Cordaro, 2010): "At this moment, I am having nostalgic feelings," "At this moment, I feel nostalgic" (1 = *strongly disagree*, 7 = *strongly agree*). We measured momentary *intrinsic motivation* with Gagné et al. (2010) 3-item scale. It asks: "Please, indicate for each item to what extent it describes why you are doing this work." The items were: "Because I enjoy this work very much," "Because I have fun doing this job," "For the moments of pleasure that this job brings me" (1 = *strongly disagree*, 7 = *strongly agree*). We averaged responses into an intrinsic motivation index.

The content of nostalgic narratives is more positive than negative (Abeysa, Routledge, Roylance, Wildschut, & Sedikides, 2015; Wildschut et al., 2006), and nostalgia typically (Hepper et al., 2012; Stephan et al., 2012; Wildschut et al., 2006, 2010; Zhou, Wildschut, Sedikides, Shi, & Feng, 2012, Study 1), but not always (Turner, Wildschut, Sedikides, & Gheorghiu, 2013; Van Dijke et al., 2015; Zhou et al., 2012, Studies 2–4), increases positive affect. Investigations have begun to establish unique effects of nostalgia above and beyond positive affect (Cheung et al., 2013; Routledge, Wildschut, Sedikides, Juhl, & Arndt, 2012; Sedikides et al., 2016; Sedikides, Wildschut, Routledge, & Arndt, 2015; Stephan et al., 2012, 2014; Turner et al., 2013; Turner, Wildschut, & Sedikides, 2012; Van Dijke et al., 2015; Van Tilburg, Igou, & Sedikides, 2013). However, positive affect has been linked with intrinsic motivation (Vallerand, 1997). We thus needed to find out if the capacity of nostalgia to boost intrinsic motivation in situations of low (rather than high) interactional justice derives merely from the transient valence of nostalgic experiences. Taking the lead from prior research (Hepper

et al., 2012; Wildschut et al., 2006, 2010), we measured daily *positive affect* (PA) with the items “happy” and “content” (1 = *not at all*, 5 = *very strongly*). We averaged responses to form a PA index.

Theoretical and practical considerations determined how we measured each variable. Practically, the daily questionnaire should be short, for respondents to be able to fill it out during their working day. Nostalgia is a fleeting emotion. We therefore measured it as a momentary (i.e., daily) variable. To test if nostalgia predicts intrinsic motivation while controlling for the role of PA, we also included these variables in our daily questionnaire. We operationalized interactional justice as a chronic variable, thus looking only at between-person variations. We did this for two reasons. First, up to two thirds of the variance in interactional justice is at the between-person level, implying that perceptions of interactional justice are relatively stable and do not change much from day to day (Ferris, Spence, Brown, & Heller, 2012; Loi, Yang, & Diefendorff, 2009). Second, there was no theoretical necessity to operationalize interactional justice as a within-participants variable; our predictions would have been the same had we operationalized interactional justice as a within-participants variable.

We conducted Confirmatory Factor Analyses (CFA) to determine whether the momentary measures accurately represent distinct constructs (Anderson & Gerbing, 1988). We first estimated a model with three latent variables (nostalgia, intrinsic motivation, and PA). This model fit the data well,  $\chi^2(11) = 15.47$ ,  $p = .162$ , CFI = 0.99, RMSEA = 0.02, RMR = 0.02, and all items loaded significantly on their intended factor. We also fit a one-factor model in which all items loaded onto one latent variable. The fit of this model was insufficient,  $\chi^2(14) = 5174.79$ ,  $p < .001$ , CFI = 0.24, RMSEA = 0.60, RMR = 0.71, and significantly inferior to that of the 3-factor model,  $\chi^2(3) = 5159.3$ ,  $p < 0.001$ . Thus, the unique constructs of nostalgia, intrinsic motivation, and PA were operationalized with distinct scales.<sup>2</sup>

## 4.2. Results and discussion

Our data had a nested structure. We had up to 10 momentary observations of nostalgia, intrinsic motivation, and PA nested within participants; we measured interactional justice once per participant. We used hierarchical linear modelling (HLM; SPSS version 22). All of our models included a fixed and random intercept, to account for the nesting of momentary observations within participants<sup>3</sup>. We centered

<sup>2</sup> We included, for exploratory purposes, the following measures (administered at a single time) that prior work has identified as antecedents or outcomes of nostalgia (Sedikides, Wildschut, Routledge, Arndt, et al., 2015): a 4-item self-concept clarity scale that we constructed; a 4-item self-esteem scale (Wildschut et al., 2006), as well as a 1-item self-esteem scale (Robins, Hendin, & Trzesniewski, 2001); a 2-item neuroticism scale (Gosling, Rentfrow, & Swann, 2003); a 6-item resilience scale (Smith et al., 2008); a 5-item deficit orientation scale (Lavigne, Vallerand, & Crevier-Braud, 2011); the 7-item Southampton Nostalgia Scale (Barrett et al., 2010; Routledge et al., 2008) referring both to personal and organizational nostalgia; and an 8-item organizational nostalgia scale that we constructed. Using these measures as controls or moderators of the Interactional Justice  $\times$  Nostalgia interaction on intrinsic motivation did not alter the results. We also incorporated a 2-item measure of daily negative affect (in addition to the 2-item measure of daily positive affect that we report in the text; Wildschut et al., 2006). Including negative affect as control did not alter the Interactional Justice  $\times$  Nostalgia interaction effect on intrinsic motivation. Moreover, we included three interpersonal and three informational justice items as daily measures (Colquitt, 2001). The patterns of interaction between nostalgia and daily interpersonal ( $p = 0.048$ ) or informational ( $p = 0.170$ ) justice on intrinsic motivation were similar to the Interactional Justice  $\times$  Nostalgia interaction on intrinsic motivation reported in the text. Finally, we included, as part of an unrelated project, single-time measures of Colquitt (2001) 4-item distributive justice and 7-item procedural justice scales.

<sup>3</sup> Observations on the criterion are not independent, thus violating assumptions of ordinary regression techniques (Kenny & Judd, 1986). This dependence amounts to significant between-person variance (i.e., some of the variance in

interactional justice on the grand mean (GMC) by subtracting the sample mean from each observation. We were interested in testing how momentary variations in nostalgia predict daily intrinsic motivation (contingent upon the level of interactional justice). We therefore subtracted the person-mean to which the observation belongs from each observation (i.e., centering within context [CWC]) for the daily variables.<sup>4</sup>

### 4.2.1. Hypothesis testing

In a first model, we added momentary nostalgia as a fixed effect. Momentary nostalgia predicted increased momentary intrinsic motivation (Table 2, Model 1). Next, we included a random component for momentary nostalgia, which was significant (Table 2, Model 2). Hence, we found evidence that the slopes of the association between momentary nostalgia and momentary intrinsic motivation differed significantly between employees.

To test H1, we subsequently assessed the cross-level interaction between chronic interactional justice and momentary nostalgia. We started by adding chronic interactional justice as a fixed effect between-person predictor in the model. In this model, chronic interactional justice predicted lowered momentary intrinsic motivation, and momentary nostalgia predicted elevated momentary intrinsic motivation (Table 2, Model 3). Next, we added the interaction term between momentary nostalgia and chronic interactional justice (Table 2, Model 4). Momentary intrinsic motivation was predicted by chronic interactional justice, momentary nostalgia, and the Nostalgia  $\times$  Interactional Justice interaction (Fig. 2).

To identify the exact relationship between momentary nostalgia and momentary intrinsic motivation as a function of high (vs. low) chronic interactional justice, we conducted regions-of-significance analyses. We used the methods and online calculator developed by Preacher, Curran, and Bauer (2006), which applies the Johnson and Neyman (1936) regions-of-significance technique to multilevel analyses. This technique identifies the regions of a continuous moderator in which the association between the predictor and criterion variable is statistically significant, thereby avoiding the need to define arbitrarily low, moderate, and high values of the moderator. Momentary nostalgia was related positively to momentary intrinsic motivation at low (but not high) values of chronic interactional justice (i.e., below the value 0.013 [0.19 SD] of chronic interactional justice).

Finding that the association between momentary nostalgia and momentary intrinsic motivation was stronger among participants who experienced low (vs. high) chronic interactional justice is consistent with H1. The corollary to H1 implies that the association between low (vs. high) chronic interactional justice and reduced momentary intrinsic motivation is weaker when momentary nostalgia is high (vs. low). Visual inspection of the simple slopes (Fig. 2) aligns with such a pattern. We proceeded to probe the simple effects of chronic interactional justice, contingent upon level of momentary nostalgia (Preacher et al., 2006). Chronic interactional justice was related to momentary intrinsic

(footnote continued)

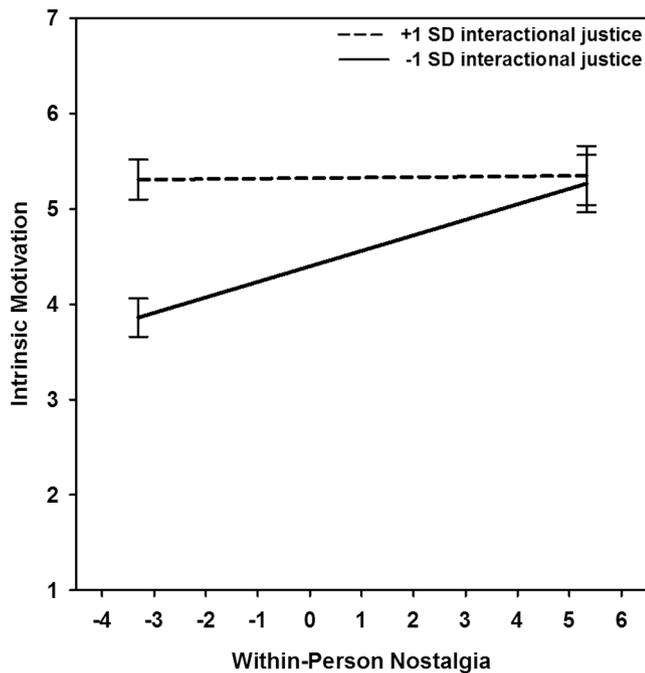
the criterion is due to the nesting of observations in a higher-level unit). We tested this possibility by fitting a null model, which partitions the variance in the criterion in a between- and within-person component. We found significant between-person variance in momentary nostalgia ( $\tau_{00} = 1.17$ ,  $Wald Z = 7.03$ ,  $p < 0.001$ ) and intrinsic motivation ( $\tau_{00} = 1.35$ ,  $Wald Z = 7.54$ ,  $p < 0.001$ ). ICCs indicated that 51% of the variance in nostalgia and 68% of the variance in intrinsic motivation was situated at the between-person level.

<sup>4</sup> In an additional analysis, we also retained the average of each person's observations by entering it as a between-person variable in the analyses (Enders & Tofighi, 2007; Zhang et al., 2009). This allows testing whether, in addition to momentary variations in nostalgia, between-person differences in nostalgia across days predict intrinsic motivation contingent upon interactional justice. The Between-Person Nostalgia  $\times$  Interactional Justice interaction did not significantly predict intrinsic motivation.

**Table 2**  
Results of multilevel analysis for intrinsic motivation, Study 1.

	Model 1		Model 2		Model 3		Model 4	
Parameter	Fixed effects							
	$\gamma$ (SE)	<i>p</i>	$\gamma$ (SE)	<i>p</i>	$\gamma$ (SE)	<i>p</i>	$\gamma$ (SE)	<i>p</i>
<b>Within-person</b>								
Nostalgia	0.06 (0.03)	0.024	0.09 (0.04)	0.014	0.09 (0.04)	0.015	0.08 (0.04)	0.019
<b>Between-person</b>								
Interactional justice					0.67 (0.13)	< 0.001	0.66 (0.13)	< 0.001
<b>Cross-level</b>								
Nostalgia × interactional justice							−0.11 (0.05)	0.027
	Random effects							
<b>Within-person</b>								
Nostalgia			0.05 (0.02)	0.002	0.05 (0.02)	0.002	0.05 (0.02)	0.003

Note. Standard errors within parentheses.



**Fig. 2.** Interaction between nostalgia (CWC) and interactional justice (CWC) on intrinsic motivation in Study 1. Dashed line is at +1 SD interactional justice. Solid line is at −1 SD interactional justice. Error bars represent standard errors.

motivation at low (but not high) values of daily nostalgia (i.e., below the value of 2.67 [2.17 SD] on momentary nostalgia).

These analyses provide support for H1, in that high (vs. low) momentary nostalgia predicts elevated momentary intrinsic motivation particularly among participants experiencing low chronic interactional justice. Specifically, momentary intrinsic motivation was weakest when low daily nostalgia and low chronic interactional justice were juxtaposed. These results are consistent with views of emotions as elicited by, and producing a response to, specific triggers (Ellsworth & Smith, 1988; Keltner & Haidt, 1999).<sup>5</sup>

4.2.2. Supplemental analyses

The role of nostalgia in promoting intrinsic motivation (when

<sup>5</sup> Informational and interpersonal justice were strongly correlated ( $r = 0.71$ ,  $p < 0.001$ ). We nevertheless conducted separate analyses for interpersonal and informational justice. The Nostalgia × Interpersonal Justice interaction predicted intrinsic motivation ( $\gamma = -0.10$ ,  $t[885] = -3.08$ ,  $p = 0.002$ ). Likewise, the Nostalgia × Informational Justice interaction predicted intrinsic motivation ( $\gamma = -0.09$ ,  $t[885] = -2.90$ ,  $p = 0.004$ ). The pattern of each effect was similar to the corresponding one for interactional justice (which we report).

**Table 3**  
Results of supplemental analysis Study 1.

Predictor	$\gamma$ (SE)	<i>p</i>
<i>Fixed effects</i>		
Nostalgia	0.05 (0.03)	0.077
Interactional justice	0.67 (0.13)	< 0.001
Positive affect	0.29 (0.04)	< 0.001
Time	0.08 (0.008)	< 0.001
Nostalgia × Interactional Justice	−0.09 (0.04)	0.040
Positive Affect × Interactional Justice	0.05 (0.050)	0.267
Time × Nostalgia	−0.02 (0.009)	0.024
Time × Interactional Justice	0.03 (0.01)	0.006
Time × Nostalgia × Interactional Justice	−0.02 (0.01)	0.103
<i>Random effects</i>		
Nostalgia	0.03 (0.01)	0.009

interactional justice is low) might simply be due to its association with increased PA. In addition, because employees completed surveys over 10 consecutive working days, responses may vary systematically with measurement day (Yip, 2005). We first tested whether momentary PA predicted momentary intrinsic motivation, which it did ( $\gamma = 0.33$ ,  $t[886] = 8.75$ ,  $p < 0.001$ ). A second analysis showed that participants scored higher on nostalgia ( $\gamma = 0.03$ ,  $t[898] = 2.80$ ,  $p = 0.005$ ) and intrinsic motivation ( $\gamma = 0.09$ ,  $t[893] = 10.86$ ,  $p < 0.001$ ) on later measurement days.

In order to control for PA and measurement day (time) we fitted a model with daily intrinsic motivation as criterion variable. We included in the model nostalgia, interactional justice, the Nostalgia × Interactional Justice interaction, PA, the PA × Interactional Justice interaction, time (GMC), the Time × Nostalgia interaction, the Time × Interactional Justice, and the Time × Nostalgia × Interactional Justice interaction. We present the result in Table 3. Crucially, the predicted interaction between daily nostalgia and interactional justice on intrinsic motivation remained significant in this model.

5. Study 2

In supporting H1 and its corollary, Study 1 provided the first direct evidence for the role of momentary nostalgia in offsetting organizational adversity. High (vs. low) spontaneously experienced momentary nostalgia was associated with heightened levels of momentary intrinsic motivation, but only in contexts marked by low (vs. high) chronic interactional justice.

The design of Study 1 did not allow for causal inferences. Thus, we cannot ascertain that, among employees experiencing low (vs. high) interactional justice, high (vs. low) nostalgia leads to heightened intrinsic motivation. One might, for instance, argue that high intrinsic motivation conduces to the experience of predominantly positive emotions, such as nostalgia. Prior laboratory research has shown that

**Table 4**  
Descriptive statistics, within- and between-person correlations, reliabilities, and correlations, Study 2.

Variables	<i>M</i>	<i>SD</i>	$\alpha/r$	1	2	3	4
Manipulation check	3.19	1.76	0.94				
1. Intrinsic motivation <sup>a</sup>	5.06	1.32	0.95	–	0.54 (< 0.001)	0.51 (< 0.001)	
2. Work effort <sup>a</sup>	5.28	1.07	0.75	0.59 (< 0.001)	–	0.35 (< 0.001)	
3. Positive affect <sup>a</sup>	3.69	0.83	0.79	0.55 (< 0.001)	0.37 (< 0.001)	–	
4. Interactional justice <sup>b</sup>	3.67	0.74	0.91	0.39 (< 0.001)	0.22 (< 0.001)	0.36 (< 0.001)	–

*Notes.* Means and standard deviations for the within-person variables are based on the uncentered scores. Correlations below the main diagonal are between-person correlations (i.e., within-person variables averaged at the between-person level;  $N = 302$ ). Correlations above the main diagonal are within-person correlations ( $N = 1148$ ).

<sup>a</sup> Within-person (level 1) variable.

<sup>b</sup> Between-person (level 2) variable.

the causal effects of nostalgia are pronounced in threatening situations (Sedikides & Wildschut, 2017; Sedikides et al., 2015). Does induced nostalgia also cause stronger intrinsic motivation in the context of low (vs. high) interactional justice in real-world settings? We addressed this question in Study 2. Furthermore, in Study 2 we tested the downstream consequences of intrinsic motivation (Fig. 1). Thus, in addition to examining whether nostalgia promotes intrinsic motivation in the context of low (vs. high) interactional justice (H1), we assessed if nostalgia promotes work effort in the context of low (vs. high) interactional justice via the mediating mechanism of heightened intrinsic motivation (H2).

Study 2 was a field experiment (i.e., intervention) among employees. We first assessed chronic interactional justice in a pretest. At a later period, we induced nostalgia by randomly assigning participants to bring to mind and describe either a nostalgic or a regular autobiographical experience (Sedikides et al., 2015). They did so for five consecutive days upon arriving at work in the morning. Then, at a random moment during the workday, we measured participants' intrinsic motivation, work effort, and PA. Although emotions are usually viewed as fleeting, they can have a more lasting influence on cognition (Rimé, 2009) and wellbeing (Fredrickson & Joiner, 2002).

## 5.1. Method

### 5.1.1. Sample

As in Study 1, we collected data through Flycatcher. We recruited individuals who were employed full-time in organizations (i.e., not self-employed) and who had regular working hours (i.e., between 8:00 am and 6:00 pm). None of the Study 2 employees had taken part in Study 1. We aimed to collect at least the same number of daily measurements as in Study 1 (i.e., 1012). Given that we collected five daily measures per participant (rather than 10, as we did in Study 1), we opted for a relatively large sample of 385 employees (231 male, 134 female), working in a variety of companies. We asked participants to complete a daily survey on each of 5 consecutive work days. We collected a total of 1427 daily surveys (74% response rate), nested in 338 individuals. Of these, 212 participants (55%) completed all five surveys, 59 (15%) completed four surveys, 22 (6%) completed three surveys, 20 (5%) completed two surveys, and 25 (6%) completed one survey (47 participants [12%] did not complete any daily survey). Participants' age ranged from 22 to 64 years ( $M = 38.10$ ,  $SD = 10.32$ ). Ten percent had completed secondary education only, 21% subsequent vocational training, 34% a Bachelor's degree, and 35% a Master's degree. Their organizational tenure ranged between 0 and 11 years ( $M = 4.75$ ,  $SD = 3.41$ ). Forty-nine percent did not have a managerial position, 10% had a line management position, 18% had a middle management position, and 5% had a senior management position. Based on criteria explained below (under "Procedure and measures"), we included in the analyses 1152 daily surveys, nested within 311 participants.

### 5.1.2. Procedure and measures

We collected three types of data (see Table 4 for scale statistics and correlations). First, we assessed chronic interactional justice (and demographics). Second, starting a week later, and on each of five consecutive study days, we sent participants an email at 7:00 am containing a website link to the nostalgia intervention. We asked them to complete the intervention at work, before they commenced with normal duties. Third, and also on each study day, we sent participants a text message at a random time before midday, asking them to complete the daily measures on their smartphone.

We measured chronic interactional justice with the same scale as in Study 1. The nostalgia intervention consisted of the Event Reflection Task (ERT; Sedikides et al., 2015; see also: Wildschut et al., 2006; Van Dijke et al., 2015). In the nostalgia condition, participants reflected on and wrote about a nostalgic event from their past. In the control condition, participants reflected on and wrote about an ordinary (e.g., regular, everyday) event from their past. Specifically, participants in the nostalgia condition read:

*According to the Oxford Dictionary, 'nostalgia' is defined as a 'sentimental longing for the past.' Please think of a nostalgic event in your life. Specifically, try to think of a past event that makes you feel most nostalgic. Bring this nostalgic experience to mind. Immerse yourself in the nostalgic experience. How does it make you feel? Please write down four keywords relevant to this nostalgic event (i.e., words that describe the experience).*

Participants in the control condition read:

*Please think of an ordinary event in your life. Specifically, try to think of a past event that is ordinary. Bring this ordinary experience to mind. Immerse yourself in the ordinary experience. How does it make you feel? Please write down four keywords relevant to this ordinary event (i.e., words that describe the experience).*

In both conditions, participants then provided a narrative description of the recalled event in a text box. We proceeded to check the effectiveness of the ERT with the 2-item scale (Hepper et al., 2012; Wildschut et al., 2006, 2010) that we used in Study 1: "At this moment, I am having nostalgic feelings," "At this moment, I feel nostalgic" (1 = strongly disagree, 7 = strongly agree). We averaged responses to form a manipulation check index. We excluded from the analyses 274 (19%) daily surveys, because participants did not follow instructions (e.g., they left the space blank or remarked that they could not think of anything to write).

As in Study 1, the momentary measures were preceded by the stem: "At the moment of receiving the text message, how did you feel about your work?". We measured intrinsic motivation with the same scale as in Study 1. We measured work effort with two items from Brown and Leigh (1996) scale: "I strived as hard as I can to be successful in my work," "I really exerted myself to the fullest at work" (1 = strongly disagree, 7 = strongly agree). We included two out of the five items (i.e., those

**Table 5**  
Results of multilevel analysis, Study 2.

Parameter	Model 1		Model 2		Model 3		Model 4		Model 5	
	$\gamma$ (SE)	<i>p</i>								
<b>Fixed Effects</b>										
<b>Between-person</b>										
Nostalgia	0.09 (0.08)	0.241	0.08 (0.08)	0.275	0.04 (0.06)	0.550	0.03 (0.06)	0.604	-0.01 (0.05)	0.792
Interactional justice	0.58 (0.11)	< 0.001	0.59 (0.10)	< 0.001	0.32 (0.08)	< 0.001	0.33 (0.08)	< 0.001	0.05 (0.07)	0.513
Intrinsic motivation									0.48 (0.04)	< 0.001
Nostalgia × Interactional Justice			-0.24 (0.10)	0.021			-0.20 (0.08)	0.019	-0.07 (0.07)	0.275

Note. The criterion variable in Model 1 and 2 is intrinsic motivation; the criterion variable in model 3 to 5 is work effort.

manifesting the highest item-factor loadings in Brown and Leigh’s factor analysis), due to strict space limitations. We averaged responses to obtain a work effort index. Finally, we measured PA with the same two items as in Study 1, creating a PA index.

We conducted CFA to determine the distinctness of the momentary measured scales. We first estimated a 3-factor model (intrinsic motivation, PA, and work effort). This model fit the data very well,  $\chi^2(11) = 11.67, p = 0.389, CFI = 1.00, RMSEA = 0.007, RMR = 0.02$ , and all items loaded significantly on their intended factor.<sup>6</sup> We then fit a 1-factor model in which all items loaded onto one latent variable. The fit of this model was insufficient,  $\chi^2(14) = 4940.69, p < 0.001, CFI = 0.27, RMSEA = 0.55, RMR = 0.61$ . The fit of the 1-factor model was also inferior to that of the 3-factor model,  $\chi^2(3) = 4929, p < 0.001$ . Thus, we operationalized the unique constructs of intrinsic motivation, work effort, and PA with distinct measures.<sup>7</sup>

5.2. Results

We used HLM (SPSS 22), given that up to five observations of momentary nostalgia, intrinsic motivation, work effort, and PA were nested within each respondent. As in Study 1, all of our models included a fixed and random intercept.<sup>8</sup> We effect-coded the ERT (-1 = control condition, 1 = nostalgia condition) and centered chronic interactional justice on the grand mean (GMC).

5.2.1. Manipulation check

We included event reflection as a fixed effect, between-person predictor. We obtained a significant effect of event reflection on the manipulation check ( $\gamma = 0.16, t[294.92] = 1.99, p = 0.048$ ). Participants in the nostalgia condition ( $M = 3.55, SD = 1.67$ ) reported higher levels of momentary nostalgia than those in the control condition ( $M = 3.17, SD = 1.76$ ). The manipulation was effective.

5.2.2. Intrinsic motivation

We then tested H1, thus focusing on the role of event reflection (i.e., induced nostalgia) in heightening momentary intrinsic motivation, contingent upon low (vs. high) chronic interactional justice. We first fit

<sup>6</sup> CFI = 1.00 does not indicate perfect, but excellent fit (when  $df > 1$ ). These fit values result when  $\chi^2 < df$  (Bentler, 1990).

<sup>7</sup> We included the same additional scales as in Study 1. We also included as single-time measures a 12-item locomotion scale (Kruglanski et al., 2000) and the 20-item nostalgia inventory (Batcho, 1995). As in Study 1, including any of these measures as controls or as moderators of the Interactional Justice × Nostalgia interaction did not alter this interaction effect on intrinsic motivation.

<sup>8</sup> As in Study 1, we tested if significant between-person variance existed in the criterion variables, fitting a null model that partitioned the variance into between-person and within-person components. We found significant between-person variance in intrinsic motivation ( $\tau_{00} = 1.42, Wald Z = 10.81, p < 0.001$ ) and work effort ( $\tau_{00} = 0.85, Wald Z = 9.50, p < 0.001$ ). ICCs indicated that 85% of the variance in intrinsic motivation and 68% of the variance in work effort was situated at the between-person level.

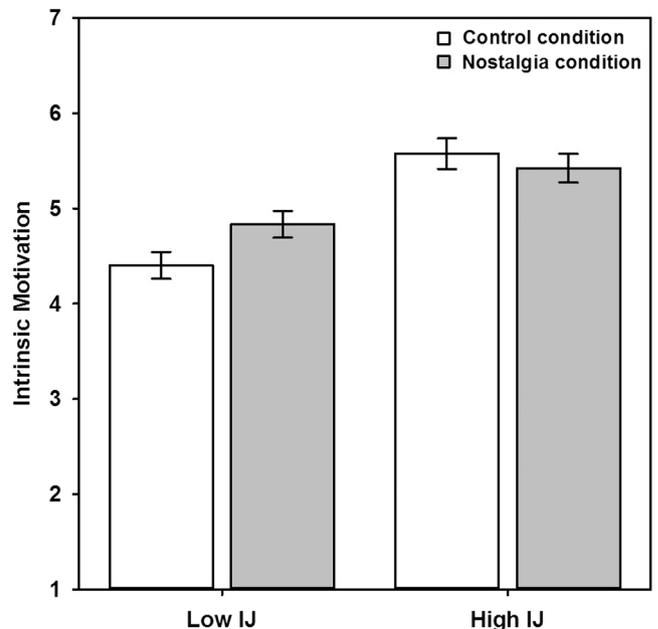


Fig. 3. Interaction between event reflection and interactional justice on intrinsic motivation in Study 2. “Low IJ” represents low interactional justice (+1 SD), “High IJ” represents high interactional justice (-2 SD). Error bars represent standard errors.

a model with event reflection and chronic interactional justice as fixed effects. The main effect of event reflection was not significant and the main effect of interactional justice was (Table 5, Model 1).

Next, we added the Event Reflection × Interactional Justice interaction term (Table 5, Model 2). This model included chronic interactional justice, event reflection, and their interaction as predictors (all fixed effects). The Event Reflection × Interactional Justice interaction predicted momentary intrinsic motivation (Fig. 3). To identify the exact shape of nostalgia’s effect on momentary intrinsic motivation as a function of high (vs. low) interactional justice, we conducted regions-of-significance analyses using the same methods as in Study 1 (Preacher et al., 2006). Nostalgia (relative to control) increased momentary intrinsic motivation when chronic interactional justice was low, but not when it was high (i.e., at values smaller than -0.31 [-0.43 SD] on chronic interactional justice).

Consistent with H1, the effect of nostalgia (vs. control) on momentary intrinsic motivation was stronger among participants experiencing low (vs. high) chronic interactional justice. The corollary to H1 implies that the association between low (vs. high) chronic interactional justice and reduced momentary intrinsic motivation is weaker when nostalgia is high (vs. low). Visual inspection of the simple slopes (Fig. 3) aligns with this pattern. As a formal test, we probed the simple

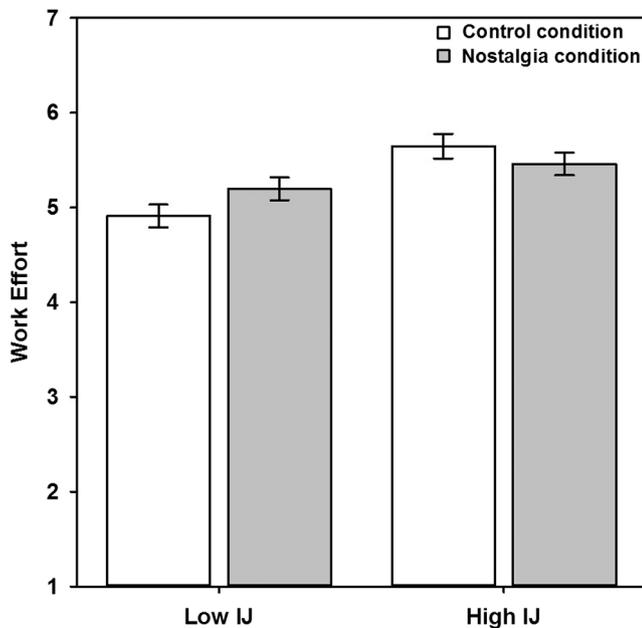


Fig. 4. Interaction between event reflection and interactional justice (GMC) on work effort in Study 2. “Low IJ” represents low interactional justice ( $-1$  SD), “High IJ” represents high interactional justice ( $+1$  SD). Error bars represent standard errors.

effects of chronic interactional justice, contingent upon level of event reflection (Preacher et al., 2006). The association between chronic interactional justice and momentary intrinsic motivation was weaker in the nostalgia condition ( $\gamma = 0.35$ ,  $t[236.83] = 2.47$ ,  $p = 0.014$ ) than in the control condition ( $\gamma = 0.84$ ,  $t[238.02] = 5.49$ ,  $p < 0.001$ ). Hence, in support of H1 and replicating Study 1, we observed particularly weak momentary intrinsic motivation when low nostalgia and low chronic interactional justice were juxtaposed.

### 5.2.3. Work effort

We proceeded to test H2, first focusing on the role of induced nostalgia in stimulating momentary work effort, contingent upon low (vs. high) chronic interactional justice. We first fit a model with event reflection and chronic interactional justice as fixed effects (Table 5, Model 3). Event reflection did not significantly affect momentary work effort. Interactional justice was significantly associated with daily work effort.

In the following step, we added the Event Reflection  $\times$  Interactional Justice interaction term. The final model included chronic interactional justice, event reflection, and their interaction as predictors—all fixed effects (Table 5, Model 4). The interaction predicted work effort (Fig. 4). To identify the exact effect of nostalgia on momentary work effort as a function of high (vs. low) chronic interactional justice we again conducted regions-of-significance analyses, in which we treated event reflection as the predictor and chronic interactional justice as the moderator (Preacher et al., 2006). Nostalgia (relative to control) increased significantly momentary work effort when chronic interactional justice was low (rather than high; i.e., at values below  $-0.62$  [ $-0.86$  SD] on chronic interactional justice).

Finally, we tested if the association between low (vs. high) chronic interactional justice and reduced momentary work effort is weaker when nostalgia is high (vs. low). Fig. 4 is consistent with this pattern. Further simple slopes analyses showed that the association between chronic interactional justice and momentary work effort was weaker in the nostalgia condition ( $\gamma = 0.13$ ,  $t[222.41] = 1.17$ ,  $p = 0.243$ ) than in the control condition ( $\gamma = 0.53$ ,  $t[226.69] = 4.31$ ,  $p < 0.001$ ). We thus observed particularly low momentary work effort when low nostalgia and low chronic interactional justice were juxtaposed.

### 5.2.4. Moderated mediation analyses

The above-described analyses supported H1 and part of H2 by showing that induced nostalgia (vs. control) increases momentary intrinsic motivation and work effort, particularly when chronic interactional justice is low (vs. high). We proceeded to test the full moderated mediation model implied in H2, where the indirect effect of induced nostalgia (vs. control) on increased momentary work effort, via increased momentary intrinsic motivation, is stronger when chronic interactional justice is low (vs. high; Fig. 1). Edwards and Lambert (2007) referred to this model as a direct effect and first stage moderation model.

We first tested if momentary intrinsic motivation predicts momentary work effort, and if, when entering momentary intrinsic motivation as a predictor, the Event Reflection  $\times$  Interactional Justice interaction still predicts work effort. We conducted a HLM analysis in which we included momentary intrinsic motivation, chronic interactional justice, event reflection, and the Event Reflection  $\times$  Interactional Justice interaction as predictors. Work effort was the criterion (Table 5, Model 5). Momentary work effort was predicted by momentary intrinsic motivation but not by event reflection, chronic interactional justice, or their interaction. This is initial evidence for our moderated mediation model.

Next, we used an extension of the procedure recommended by Zhang, Zyphur, and Preacher (2009) to test whether the indirect effect of event reflection on work effort, via momentary intrinsic motivation, was stronger when chronic interactional justice was low (vs. high). We operationalized the indirect effect (denoted as  $ab$ ) as the product of the path from the predictor to the mediator ( $a$  path) (contingent upon the moderator) and the path from the mediator to the criterion ( $b$  path). We obtained the  $\gamma$  and standard error of event reflection on daily intrinsic motivation from the above-described HLM analyses under “Intrinsic motivation” ( $a$  path). At low chronic interactional justice (1 SD below the mean), the  $a$  path was significant ( $\gamma = 0.26$ ,  $SE = 0.10$ ,  $t(238.57) = 2.47$ ,  $p = 0.014$ ); at high chronic interactional justice (1 SD above the mean) the  $a$  path was not significant ( $\gamma = -0.09$ ,  $SE = 0.11$ ,  $t(235.52) = -0.85$ ,  $p = 0.399$ ). We obtained the  $\gamma$  and standard error of momentary intrinsic motivation on momentary work effort from the above-described analyses under “Moderated mediation analyses” ( $b$  path). We entered the  $\gamma$ s for the  $a$  path (contingent upon high vs. low chronic interactional justice) and  $b$  path in a Monte Carlo analysis (with 20,000 samples; Selig & Preacher, 2008; Zhang et al., 2009). The analysis calculates a 95% CI for the estimate of the indirect effect.

In support of H2, at low levels of chronic interactional justice, the indirect effect of nostalgia on momentary work effort, via momentary intrinsic motivation, differed significantly from 0,  $ab = 0.13$ , 95% CI = [0.03; 0.22]. However, the indirect effect of nostalgia on work effort, via momentary intrinsic motivation, did not significantly differ from 0 at high levels of chronic interactional justice,  $ab = -0.05$ , 95% CI = [ $-0.15$ ; 0.06]. Taken together, in support of H2, induced nostalgia (vs. control) heightened intrinsic motivation and, consequently, increased momentary work effort. This pattern emerged particularly among participants experiencing low (vs. high) chronic interactional justice.<sup>9</sup>

<sup>9</sup> As in Study 1, informational and interpersonal justice were strongly correlated ( $r = 0.68$ ,  $p < 0.001$ ). We nevertheless tested the interactions of nostalgia with the two interactional justice components. The Event Reflection  $\times$  Interpersonal Justice interaction marginally predicted momentary intrinsic motivation ( $\gamma = -0.19$ ,  $t[237.14] = -1.90$ ,  $p = 0.059$ ), and significantly predicted momentary work effort ( $\gamma = -0.20$ ,  $t[224.70] = -2.54$ ,  $p = 0.012$ ). The Event Reflection  $\times$  Informational Justice interaction significantly predicted momentary intrinsic motivation ( $\gamma = -0.23$ ,  $t[237.02] = -2.38$ ,  $p = 0.018$ ), and marginally predicted momentary work effort ( $\gamma = -0.14$ ,  $t[223.52] = -1.85$ ,  $p = 0.066$ ). The two marginal effects were in the expected direction. In addition, the pattern of each effect was similar to the corresponding interactional justice pattern that we reported.

### 5.2.5. Supplemental analyses

As in Study 1, we tested for the associations between PA, measurement day (time) and our two criterion variables: intrinsic motivation and work effort. Time (GMC) did not predict intrinsic motivation ( $\gamma = 0.009$ ,  $t[666] = 0.70$ ,  $p = 0.486$ ) or work effort ( $\gamma = -0.008$ ,  $t[670.80] = -0.51$ ,  $p = 0.613$ ). Given that time was not associated with our criterion (or predictor) variables, we do not control for it.

In order to test if the role of nostalgia is simply due to its capacity to increase PA, we conducted analyses with momentary intrinsic motivation as criterion in which we controlled for momentary PA (CWC) and its interaction with chronic interactional justice. Momentary PA was positively related to momentary intrinsic motivation ( $\gamma = 0.24$ ,  $t[606.10] = 6.98$ ,  $p < 0.001$ ). The PA  $\times$  Interactional Justice interaction did not predict momentary intrinsic motivation ( $\gamma = -0.005$ ,  $t[604.40] = -0.12$ ,  $p = 0.907$ ). The Event Reflection  $\times$  Interactional Justice interaction still significantly predicted momentary intrinsic motivation ( $\gamma = -0.24$ ,  $t[237.30] = -2.33$ ,  $p = 0.021$ ).

We conducted the same analyses with momentary work effort as criterion, controlling for daily PA and its interaction with chronic interactional justice. Momentary PA predicted work effort ( $\gamma = 0.17$ ,  $t[596] = 3.90$ ,  $p < 0.001$ ). The PA  $\times$  Interactional Justice interaction did not predict momentary work effort ( $\gamma = -0.05$ ,  $t[594.30] = -0.82$ ,  $p = 0.413$ ). When controlling for daily PA, the Event Reflection  $\times$  Interactional Justice interaction predicted work effort ( $\gamma = -0.20$ ,  $t[224] = -2.36$ ,  $p = 0.019$ ). PA did not qualify our findings. In addition, PA is not more strongly associated with higher momentary intrinsic motivation and work effort in the presence of low (vs. high) chronic interactional justice.

We also explored the role of work- or organization-based nostalgic recollections versus personal nostalgic recollections. Of the nostalgic narratives, 73 (14%) described work-related events (e.g., interactions with colleagues, milestones or achievements in the organization), whereas 192 (31%) of the control narratives described work-related themes. We conducted analyses in which we included the Interactional Justice  $\times$  Nostalgia  $\times$  Narrative Type (work vs. non-work) interaction (and all lower order effects). This three-way interaction did not significantly predict intrinsic motivation ( $\gamma = -0.07$ ,  $t[669.50] = -0.074$ ,  $p = 0.460$ ) or work effort ( $\gamma = -0.11$ ,  $t[791.50] = -0.98$ ,  $p = 0.326$ ). Thus, type of recollection (work-related vs. not) does not qualify the results. As such, this analysis provides no evidence that personal nostalgia is significantly more (or less) effective than organizational nostalgia in increasing intrinsic motivation or work effort when interactional justice is low. Further simple interaction analyses (Preacher et al., 2006) showed that, for personal-nostalgia narratives, the Interactional Justice  $\times$  Nostalgia interaction significantly predicted intrinsic motivation ( $\gamma = -0.23$ ,  $t[260] = -2.19$ ,  $p = 0.030$ ) and work effort ( $\gamma = -0.18$ ,  $t[263.60] = -2.01$ ,  $p = 0.046$ ). For organizational-nostalgia narratives, the Interactional Justice  $\times$  Nostalgia interaction also significantly predicted intrinsic motivation ( $\gamma = -0.30$ ,  $t[454.40] = -2.39$ ,  $p = 0.017$ ) and work effort ( $\gamma = -0.29$ ,  $t[595.60] = -2.37$ ,  $p = 0.018$ ). The shape of these simple interactions was very similar to the shape of the overall Interactional Justice  $\times$  Nostalgia interaction (Fig. 4).

### 5.3. Discussion

By showing that induced nostalgia (vs. control) increased intrinsic motivation in contexts marked by low (vs. high) chronic interactional justice, Study 2 provides direct support for H1. Furthermore, high (vs. low) nostalgia increased work effort via the mediating mechanism of heightened intrinsic motivation among employees experiencing low (vs. high) interactional justice (H2). We obtained this pattern for organizational nostalgia and personal nostalgia.

Study 2 conceptually replicated and extended Study 1. A limitation of both studies, however, is that interactional justice was measured rather than manipulated. This rules out causal inferences about the role

of interactional justice. Second, both studies assessed intrinsic motivation with self-report measures. Although this is a common technique suited to ESM (Deci, Koestner, & Ryan, 1999; Keller & Bless, 2008), a behavioral (rather than self-report) measure of intrinsic motivation would raise confidence in our conclusions (Deci et al., 1999; Zapata-Phelan et al., 2009). Third, Studies 1–2 did not examine how nostalgia increases intrinsic motivation when interactional justice is low. We addressed these three issues in Study 3.

## 6. Study 3

Study 3 was an experiment. We used the same nostalgia induction as in Study 2. We subsequently manipulated a specific interactional justice rule by randomly assigning participants to a condition in which they learned that the experimenter had (vs. had not) been candid in his communications. Subsequently, we measured behavioral indices of intrinsic motivation in an anagram task (Deci & Ryan, 1980; Zapata et al., 2008). To examine how nostalgia increases intrinsic motivation when interactional justice is low, we coded participants' autobiographical narratives, thus assessing unobtrusively the proposed mediating mechanism, past-self directedness.

### 6.1. Method

#### 6.1.1. Participants and design

No prior research has tested the effect of nostalgia on intrinsically motivated behavior, thus making it impossible to determine the minimum number of participants to include on the basis of power analysis. We therefore followed suggestions to test at least 50 participants per experimental condition (Simmons, Nelson, & Simonsohn, 2013). We invited 250 US-based participants via Amazon Mechanical Turk (MTurk). Given that the study purportedly involved an interaction situation, we set a time limit of 45 min (after clicking the link) for participants to complete the experiment. Of the invited participants, 227 responded in time, thus providing us with their data. We paid participants \$1. Based on criteria explained below (see measures and participant exclusion section), we excluded three participants, leaving an  $N$  of 224 (138 men, 86 women;  $M_{\text{age}} = 39.33$ ,  $SD_{\text{age}} = 11.80$ ). We randomly assigned participants to one of four conditions that resulted from orthogonally manipulating interactional justice (high vs. low) and event reflection (nostalgic vs. control).

#### 6.1.2. Procedure

Upon opening the link to the study, participants learned that it consisted of two sections grouped together for the sake of efficiency. In what was ostensibly the first study, participants completed the ERT, as in Study 2. Half of them described a past nostalgic event, and half a past ordinary event, for a minimum of 3 min. Next, they responded to a manipulation check (see below).

In what was ostensibly the second study, participants learned that researchers were evaluating a new online tool for comparing individual and group performance. This online tool employed an anagram task, which lasted for 2 min. After solving an anagram, participants could move on to the next one by clicking the "Submit" button. They could also click "Submit," if they did not solve an anagram. Participants learned that, in order to encourage high performance on the anagram task, we would grant a \$20 bonus to the five best performing participants (which we paid two weeks later). Participants' performance during the task was displayed onscreen.

Subsequently, we asked participants to review the tool on a website, as an informational gesture to future customers. Participants proceeded to access a web page on which they could write their review. There, participants encountered the reviews of the last four users. Unbeknownst to them, these reviews constituted the manipulation of interactional justice, focusing on the rule of honesty. All participants saw three neutral reviews. For example, one such review stated:

“MTurk user A34V2F0IRQ7XBO: I found this task easy to do but not a lot of fun. It is a bit tedious. You could further improve the interface by making it easier to drag and drop the letters to the right boxes. Grade: 6.” The fourth review was the actual manipulation. For participants in the low interactional justice condition, the review suggested that the experimenters were dishonest in their communication: “MTurk user A2WXNG7HKYWSUK: I did this same task three months ago. You told me at the end that I was a top-five performer and would receive a bonus within a week. However, I received it only yesterday after repeatedly asking! WHY!!! DID!!! YOU!!! PAY!!! ME!!! SO!!! LATE??? Grade: 1.” For participants in the high interactional justice condition, the review implied experimenter honesty: “MTurk user A2WXNG7HKYWSUK: I did this task before. You told me at the end that I was a top-five performer and would receive a bonus. I just received it. Thank you! Grade: 9.”

Finally, participants returned to the online tool. They learned that they would work with two others on a second set of anagrams, allowing researchers to compare individual with group performance. We informed them that, while we were establishing an online connection to these other group members, they could either continue working on the individual anagrams or do something else. However, we would not reward them for their performance. This established procedure is based on the definition of intrinsic motivation as engaging in an activity for the sake of enjoyment (vs. engaging in an alternative activity; Deci & Ryan, 1980; Zapata et al., 2008). After 3 min had passed, we told participants that we were unable to establish an on-line connection with co-workers, and therefore had to skip the group task. The assessment of demographic variables and debriefing concluded the experimental session.

### 6.1.3. Measures and participant exclusion

We checked the effectiveness of the ERT with a 3-item manipulation check (Wildschut et al., 2006): “Right now, I am feeling quite nostalgic,” “Right now, I am having nostalgic feelings,” “I feel nostalgic at the moment” (1 = *strongly disagree*, 7 = *strongly agree*;  $M = 5.07$ ,  $SD = 1.81$ ;  $\alpha = 0.98$ ). We checked the effectiveness of the interactional justice manipulation by asking participants whether they agreed with the following statement: “Have we been candid in our communications about earning a bonus?” (1 = *not at all*, 7 = *very much so*;  $M = 5.19$ ,  $SD = 1.58$ ).

The intrinsic motivation task (i.e., the task in which participants were not rewarded for their performance) resulted in four intrinsic motivation indices: (1) number of anagrams that participants attempted to solve during the task ( $M = 17.67$ ,  $SD = 7.78$ ); (2) number of anagrams that participants solved correctly during the task ( $M = 14.38$ ,  $SD = 6.50$ ); (3) time, in seconds, that participants were not engaged in any task (i.e., the number of seconds the computer mouse did not move<sup>10</sup>;  $M = 49.80$ ,  $SD = 62.09$ ); and (4) delay, in seconds, prior to commencing the task ( $M = 18.28$ ,  $SD = 31.31$ ). Principal Components Analysis extracted one factor underlying the indices with an eigenvalue > 1 (eigenvalue = 2.45), explaining 61.30% of the variance. We standardized the indices, multiplied the standardized number of seconds that the mouse did not move and the number of seconds it took participants to start the intrinsic motivation task by  $-1$ , and combined the four indices into a reliable index of intrinsic motivation ( $\alpha = 0.76$ ).

A coder, who was unaware of conditions and hypotheses, coded the recalled events in terms of salient themes (0 = *not at all part of event*, 1 = *somewhat part of event*, 2 = *clearly part of event*). To obtain an index of the focal mediating variable, the coder rated the narratives on *past-self directedness*. We explained to the coder that past-self directedness

involves a focus on one’s past. We also supplied several examples from recollections that varied on past-self directedness. An example of a recollection that involved past-self directedness was: “I thought about cooking with my Granny as a child. My Granny recognized that I enjoyed cooking when I was about 3-years-old. She started off just letting me do basic things like stirring, and as I got older I was able to do more things like actual cooking.” An example of a recollection that did not involve past-self directedness was: “I love to snuggle with my guinea pig. She’s soft & cuddly, and purrs as she’s being pet. She makes me happy.”

The coder also rated *activated PA* (reflecting themes such as active, ecstatic, interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, stimulated), *deactivated PA* (i.e., calm, relaxed, restful, serene, at ease, peaceful), *activated negative affect (NA)* (i.e., upset, disturbed, distressed, guilty, scared, hostile, irritable, ashamed, nervous, jittery, afraid), and *deactivated NA* (i.e., tired, sluggish, bored, disinterested, worn out, dull). In addition, the coder rated whether the event was *extraordinary* (i.e., special).

Finally, according to Construal Level Theory (Trope & Liberman, 2010), temporally distal events are construed on an abstract level (i.e., represented by relatively few, schematic, and ‘gist-like’ pieces of information), whereas temporally close events are construed on a concrete level (i.e., represented by concrete, detailed, and peripheral information). If nostalgic recollections are more past focused than control recollections, construal level could be an alternative explanation for the effect of nostalgia. The coder used the Linguistic Category Model (Coenen, Hedeboom, & Semin, 2006) to classify verbs and adjectives. In particular, the coder classified linguistic terms with respect to the following categories of increasing abstractness: (1) Descriptive Action Verbs, (2) Interpretive Action Verbs, (3) State Verbs, and (4) Adjectives.

To establish interrater reliability, a second coder who was also unaware of conditions and hypotheses, coded a random sample of 50 recalled events. The two coders produced highly similar results, with the lowest between-coder correlation being for past-self directedness ( $r = 0.84$ ,  $p < 0.001$ ) and the highest for activated NA ( $r = 0.91$ ,  $p < 0.001$ ).

Three participants did not follow the ERT instructions. In the nostalgia condition, one participant wrote “WHEN I VISIT SOME ONE AT THE HOME AND IT MADE MY STOMAH SO NOSTALGIA THAT MY MOUT RUN WATER MAKE ME WANT TO SPITE UP BUT I CAN EXPECT THAT WHERE I WAS” and another wrote “I get nostalgic from dead bodies”. In the control condition, one participant wrote four times “It would just be a normal experience and I would feel bored.” We removed these participants from analyses.

## 6.2. Results

### 6.2.1. Manipulation checks

A one-way Analysis of Variance (ANOVA) with event reflection as independent variable and the nostalgia manipulation check as dependent variable revealed that, as intended, participants who recalled a nostalgic event ( $M = 6.10$ ,  $SD = 0.98$ ) reported feeling more nostalgic than those who recalled an ordinary event ( $M = 4.12$ ,  $SD = 1.89$ ),  $F(1, 222) = 94.81$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.30$ . We did not include the interactional justice manipulation in this analysis, because we administered it after the check.

An Event Reflection  $\times$  Interactional Justice ANOVA on the interactional justice manipulation check showed a significant main effect of interactional justice only. As intended, participants in the low justice condition (who learned that the experimenters were likely dishonest;  $M = 4.90$ ,  $SD = 1.71$ ) reported lower justice than those in the high justice condition (who learned the experimenters were likely honest;  $M = 5.50$ ,  $SD = 1.37$ ),  $F(1, 220) = 9.73$ ,  $p = 0.002$ ,  $\eta_p^2 = 0.04$ .

<sup>10</sup> Participants may have not moved the mouse, because they were thinking about the anagram. We therefore implemented a conservative measure of lack of mouse movement by counting the number of 10-second intervals that the mouse did not move. For example, we did not consider brief absences of mouse movement (e.g., 3 sec) as task disengagement.

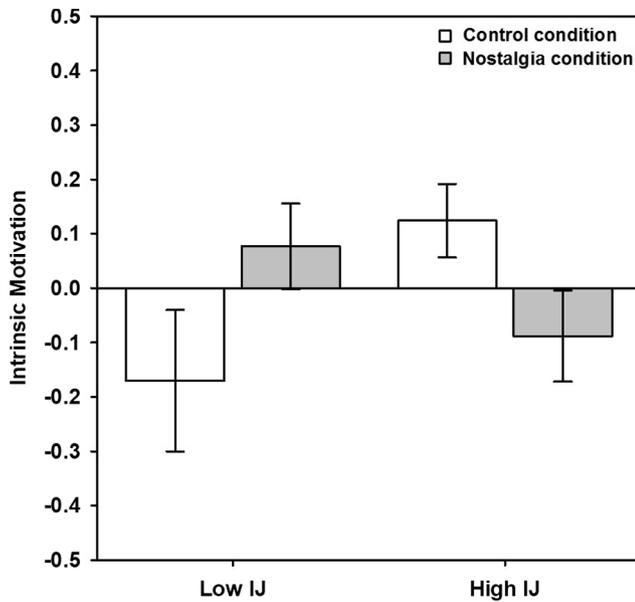


Fig. 5. Interaction between event reflection and interactional justice on intrinsic motivation in Study 3. Error bars represent standard errors.

6.2.2. Intrinsic motivation

An Event Reflection × Interactional Justice ANOVA yielded no significant main effect of interactional justice,  $F(1, 220) = 0.43, p = 0.514, \eta_p^2 = 0.002$ , or of event reflection,  $F(1, 220) = 0.05, p = 0.820, \eta_p^2 = 0.00$ . However, the Event Reflection × Interactional Justice effect was significant,  $F(1, 220) = 6.31, p = 0.013, \eta_p^2 = 0.03$  (Fig. 5). Simple-effects analyses showed that, in the low-interactional-justice condition, nostalgic participants ( $M = 0.08, SD = 0.63$ ) were higher in intrinsic motivation than control participants ( $M = -0.17, SD = 0.96$ ),  $F(1, 220) = 3.94, p = 0.048, \eta_p^2 = 0.02$ . In the high-interactional-justice condition, however, there was no significant difference between nostalgic ( $M = -0.09, SD = 0.56$ ) and control ( $M = 0.08, SD = 0.63$ ) participants,  $F(1, 220) = 2.49, p = 0.116, \eta_p^2 = 0.01$ .

We tested, as in Studies 1–2, whether nostalgia (compared to control) weakens the adverse effect of low interactional justice rather than strengthens the positive effect of high interactional justice. Inspection of the simple effects indicates that this is the case (Fig. 5). We conducted simple-effects analyses, in which we treated interactional justice as the independent variable and nostalgia as the moderator. For control participants, low interactional justice ( $M = -0.17, SD = 0.96$ ) significantly decreased intrinsic motivation relative to high interactional justice ( $M = 0.12, SD = 0.54$ ),  $F(1, 220) = 5.30, p = 0.022, \eta_p^2 = 0.02$ . However, for nostalgic participants, low interactional justice

( $M = 0.08, SD = 0.63$ ) did not significantly decrease intrinsic motivation relative to high interactional justice ( $M = -0.09, SD = 0.56$ ),  $F(1, 220) = 1.64, p = 0.202, \eta_p^2 = 0.01$ . In summary, consistent with Studies 1–2, we found particularly low intrinsic motivation when low interactional justice and low nostalgia were juxtaposed.

6.2.3. Past-self directedness

A one-way ANOVA with event reflection as independent variable and past-self directedness as dependent variable revealed that, as expected, participants who recalled a nostalgic event were more oriented toward their past than those who recalled an ordinary event (Table 6). We did not include the interactional justice manipulation in this analysis, because we administered it after participants reflected on the event.

6.2.4. Moderated mediation analyses

We proceeded to test the moderated mediation model depicted in Fig. 1 (left part). Edwards and Lambert (2007) referred to this model as direct effect and second stage moderation. We ran an initial OLS regression analysis, with three main effects (interactional justice, nostalgia, and past-self directedness) and two interaction effects (Nostalgia × Interactional Justice and Past-Self Directedness × Interactional Justice) as predictors. The criterion variable was intrinsic motivation. The analysis revealed a significant Past-Self Directedness × Interactional Justice interaction ( $\beta = -0.16, se = 0.05, t = -3.16, p = 0.002$ ). In this model, the Nostalgia × Interactional Justice interaction was no longer significant ( $\beta = -0.06, se = 0.05, t = -1.27, p = 0.205$ ).

We used the PROCESS macro to test the model (model 15; 5000 resamples; Hayes, 2013). PROCESS calculates bootstrap confidence intervals (CIs) for the indirect effect of low (vs. high) nostalgia on intrinsic motivations via past-self directedness, conditional upon interactional justice (low vs. high). The indirect effect of nostalgia on intrinsic motivation via past-self directedness was significant among participants experiencing low interactional justice,  $ab = 0.10, 95\% CI = [0.002, 0.26]$ , but not among participants experiencing high interactional justice,  $ab = -0.03, 95\% CI = [-0.07, 0.02]$ .

6.2.5. Supplemental analyses

One-way ANOVAs with event reflection as independent variable showed that, relative to ordinary events, nostalgic events were more extraordinary and reflected more activated and deactivated PA. Nostalgic narratives reflected less deactivated NA, but did not differ from ordinary narratives in activated NA. Relative to control narratives, nostalgic narratives contained marginally more Interpretive Action Verbs. Nostalgic narratives (compared to ordinary narratives) did not reliably differ in the number of Descriptive Action Verbs, State Verbs, or Adjectives. See Table 6 for the associated statistics. Supplemental moderated mediation analyses provided no evidence that any of these additional coded variables mediated the effect of nostalgia on intrinsic

Table 6  
Additional analysis, Study 3.

Outcome	M (SD) ordinary	M (SD) nostalgia	F (1,222)	p	$\eta_p^2$
Past-self directedness	1.50 (0.64)	1.94 (0.27)	43.68	< 0.001	0.16
Extraordinary	0.71 (0.72)	1.73 (0.52)	144.10	< 0.001	0.40
Activated PA	0.66 (0.89)	1.65 (0.69)	87.44	< 0.001	0.28
Deactivated PA	1.07 (0.94)	1.53 (0.74)	16.53	< 0.001	0.07
Activated NA	0.17 (0.53)	0.16 (0.48)	0.04	0.840	0.00
Deactivated NA	0.43 (0.79)	0.21 (0.56)	5.90	0.016	0.03
Interpretive action verbs	3.12 (2.59)	3.79 (2.82)	3.38	0.067	0.02
Descriptive action verbs	5.42 (3.73)	4.97 (3.57)	0.84	0.362	0.004
State verbs	0.39 (0.79)	0.41 (0.78)	0.03	0.863	0.00
Adjectives	0.17 (0.48)	0.13 (0.41)	0.45	0.505	0.00

Note. Table presents results of one-way ANOVA analyses. PA stands for positive affect, NA stands for negative affect.

motivation (among individuals experiencing low, rather than high, interactional justice).

Taken together, Study 3 findings are consistent with the idea that nostalgia promotes intrinsic motivation in the presence of low interactional justice, and that this effect of nostalgia results from inducing past-self directedness.

## 7. General discussion

We demonstrated in three studies that nostalgia predicts (Study 1) or leads to (Study 2–3) heightened intrinsic motivation and work effort (Study 2), particularly when interactional justice is low (as opposed to high). In addition, low (vs. high) interactional justice predicted (Study 1–2) or caused (Study 3) weaker intrinsic motivation only among participants low (vs. high) in nostalgia. We obtained these results regardless of whether we operationalized high (vs. low) nostalgia as being more (vs. less) nostalgic than usual (Study 1) or experimentally manipulated nostalgia (Studies 2–3). These results emerged when we operationalized intrinsic motivation as self-reported momentary intrinsic motivation (Study 1–2) or unobtrusively measured intrinsically motivated behavior (Study 3). We obtained these results regardless of whether nostalgic recollections involved organizational references or not (Study 2). Finally, these results emerged when we operationalized low (vs. high) interactional justice as chronic between-employee variations in interactional justice (Study 1–2) or as experimentally induced high (vs. low) interactional justice (Study 3).

Our findings demonstrate *why* nostalgia promotes intrinsic motivation in the presence of low interactional justice. Nostalgic recollections increase past-self directedness, reflecting the recruitment of autobiographical memories that sustain the current self-concept, which heightened intrinsic motivation in the face of low (but not high) interactional justice (Study 3). The effect of nostalgia in promoting intrinsic motivation in situations of low interactional justice was not explained by PA (Study 1–2), activated or deactivated PA or NA, or construal level (Study 3).

### 7.1. Contributions

Our research advances understanding of nostalgia by illustrating that, in organizational settings, spontaneously emerging daily nostalgia predicts stronger daily intrinsic motivation when chronic interactional justice is low (Study 1). Furthermore, although emotions are fleeting states, nostalgia (induced early in the morning) produces more lasting effects (i.e., on intrinsic motivation and ensuing work effort) later during the day when chronic interactional justice is low (Study 2). Finally, our research provides novel process evidence by showing that nostalgia promotes intrinsic motivation by inducing past-self directedness when interactional justice is low (Study 3). By so doing, our research goes beyond prior nostalgia research in organizational context, which focused on cooperation with authorities (Van Dijke et al., 2015) and perceived work meaning (Leunissen et al., 2018) in the context of short-lived laboratory situations.

Nostalgia connects the past to the present and, thus, expands the time horizon of psychological processes within organizations. In this sense, research on nostalgia bears some resemblance to work on legacy motives (i.e., desiring impact beyond one's life span) and the antecedents of such motives in organizations (Fox, Tost, & Wade-Benzoni, 2010). One primary difference between legacy motives and nostalgia is that legacy motives are strengthened by identification with past generations of organizational actors (Wade-Benzoni, 2003). Regardless of whether nostalgic recollections involve organizational content, nostalgia promotes intrinsic motivation at work (in contexts of low interactional justice). Follow-up investigations may examine whether nostalgia also influences concerns about one's future (e.g., in terms of promotion opportunities) and that of the organization.

Our findings also contribute to the intrinsic motivation literature.

Past research has identified several antecedents of intrinsic motivation, such as experienced autonomy, relatedness, and competence (Gagné & Deci, 2005), meaningfulness (Spreitzer, 2008), as well as engagement with, and attention to, what is currently occurring (i.e., “flow;” Csikszentmihalyi, 1990). Our research identifies nostalgia, which increases intrinsic motivation by instilling past-self directedness, as a novel antecedent of intrinsic motivation in threatening contexts.

Finally, our research has practical relevance. Organizations might attempt to ensure high interactional justice in order to stimulate intrinsic motivation among their members. And yet, low interactional justice is widespread (Johnson, Lanaj, & Barnes, 2014; Scott, Garza, Conlon, & Kim, 2014). Employees typically respond to such adversity in destructive ways, such as by means of passive withdrawal, retaliation, or organizational exit (Ambrose, Seabright, & Schminke, 2002; Colquitt et al., 2013). Retaliation or exit, though, can damage employees' own interests, whereas withdrawal is unsustainable. Our findings suggest that employee wellbeing and performance do not necessarily result from a strong focus on the future, as has often been claimed (Zimbardo & Boyd, 1999), but that a focus on the past can be beneficial. Specifically, resorting to nostalgia is a viable alternative strategy to respond to adversity. In the presence of low interactional justice, it is associated with (or leads to) increased intrinsic motivation, with accompanying beneficial outcomes for the organization (i.e., work effort).

Study 2 showed that only a minority of employees' spontaneous nostalgic recollections reflect past events that involve the organization, colleagues, or supervisors. However, organizational recollections were as effective as nostalgic recollections that did not reflect organizational content. This latter finding, combined with research showing that, when instructed to do so, employees do reminisce on nostalgic episodes that involve organizational events or actors (Leunissen et al., 2018), points to nostalgia induction as an integral part of programs to support organizational members during times of organizational hardship. Organizations may do this by enriching the organizational environment with symbols and stories of cherished past events.

### 7.2. Limitations and suggestions for future research

We zeroed in on nostalgia's role in responding to a common, highly adverse instance of leader mistreatment and organizational injustice: low interactional justice. Of course, members can experience other types of adversity, such as the threat of physical harm (Barr, 1998), ostracism and bullying by colleagues (Bjorkqvist, Osterman, & Hjelt-Back, 1994), lack of autonomy (Spreitzer, 2008), and even adversity that is completely outside the organization's control, such as an economic recession. Future investigations should examine whether nostalgia can offset these types of adversity as well.

We operationalized interactional justice as a between-person variable. This aligns with research documenting that up to two thirds of the variance in interactional justice is at the between-person level (Ferris et al., 2012; Loi et al., 2009). Future work may operationalize interactional justice as a daily, within-person variable. This would allow testing if low interactional justice leads to increased nostalgia, and if nostalgia counteracts a subsequent experience of low interactional justice. Such a homeostatic model of nostalgia (Routledge, Wildschut, Sedikides, & Juhl, 2013; Sedikides et al., 2015; Wildschut, Sedikides, & Cordaro, 2011) may require measuring momentary variables more than once a day, given that effects of interactional justice on nostalgia, or effects of nostalgia on work effort, may not carry over to the next day (see also note 2 and 7).

Our research may also inform the self-affirmation literature. McQueen and Klein (2006) noted that “Self-affirmation is posited to reduce individuals' defensiveness to a self-threat, but the specific causal mechanisms remain unknown” (p. 302). Similarly, Sherman and Cohen (2006, p. 223) concluded from their review of the same literature that “few if any consistent mediators have emerged across multiple studies.” Future research could test if self-affirmation promotes intrinsic

motivation in the presence of threat. Such an endeavor is not a straightforward generalization from our current findings because self-affirmation is usually operationalized as affirmation of one's own values or valued qualities (McQueen & Klein, 2006), which is not the same as a nostalgic experience. However, value- or valued-quality-affirmation may facilitate access to one's core and authentic attributes, as reflected in past-self directedness. Including past-self directedness may offer a novel approach to obtain mediational evidence in self-affirmation research.

Our finding that nostalgia increases intrinsic motivation in the presence of low interactional justice suggests that nostalgia may indirectly increase job satisfaction (the overall evaluative judgment one has about one's job; Weiss, 2002) or organizational commitment ("the relative strength of an individual's identification with and involvement in an organization;" Mowday, Steers, & Porter, 1979, p. 226), via its effect on intrinsic motivation. Job satisfaction is a broad construct that encompasses not only an evaluation of one's job activities, but also an evaluation of extrinsic rewards (Judge, Weiss, Kammeyer-Mueller, & Hulin, 2017). It is not clear how nostalgia would influence the evaluation of extrinsic rewards. Organizational commitment refers to the bond one feels with one's organization. Given that personal and organizational nostalgia both stimulate intrinsic motivation, it is unclear how nostalgia would increase organizational commitment, independent from its role in stimulating intrinsic motivation. However, we expect that nostalgia increases job satisfaction and organizational commitment via intrinsic motivation, because intrinsic motivation increases job satisfaction (Baard, Deci, & Ryan, 2004) and organizational commitment (whereas organizational commitment does not increase intrinsic motivation [Gagné & Koestner, 2002, cited in Gagné & Deci, 2005]). Future work should test whether nostalgia, by promoting intrinsic motivation, also influences these broader evaluations of the relationship that employees have with their job and organization.

### 7.3. Concluding remarks

Few experiences are worse for organization members than being treated with interactional injustice by organizational authorities. It is therefore critical to understand how members can respond to such experiences without harming their own interests. We demonstrated that nostalgia, by fostering past-self directedness, aids in maintaining high work effort via heightened intrinsic motivation. Nostalgia counteracts harmful psychological consequences that interactional injustice might entail.

### Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.obhdp.2018.12.003>.

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