

1 Article

# 2 Exploring the Vital Worker Over Time – A 3 Week-Level Study on How Positive and Negative 4 Work Events Contribute to Affect and Sustain Work 5 Engagement

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16 **Abstract:** Although work events can be regarded as pivotal elements of organizational life, only a  
17 few studies have examined how positive and negative events relate to and combine to affect work  
18 engagement over time. Theory suggests that to better understand how current events affect work  
19 engagement (WE), we have to account for recent events that have preceded these current events.  
20 We present competing theoretical views on how recent and current work events may affect  
21 employees (e.g., getting used to a high frequency of negative events or becoming more sensitive to  
22 negative events). Although the occurrence of events implies discrete changes in the experience of  
23 work, prior research has not considered whether work events actually accumulate to sustained  
24 mid-term changes in WE. To address these gaps in the literature, we conducted a week-level  
25 longitudinal study across a period of 15 consecutive weeks among 135 employees, which yielded  
26 849 weekly observations. While positive events were associated with higher levels of WE within  
27 the same week, negative events were not. Our results support neither satiation nor sensitization  
28 processes. However, high frequencies of negative events in the preceding week amplified the  
29 beneficial effects of positive events on WE in the current week. Growth curve analyses show that  
30 the benefits of positive events accumulate to sustain high levels of WE. WE dissipates in the  
31 absence of continuous experience of positive events. Our study adds a temporal component and  
32 informs research that has taken a feature-oriented perspective on the dynamic interplay of job  
33 demands and resources.

34 **Keywords:** affective events; work engagement; sensitization-satiation effects; job  
35 demands-resources model; experience sampling; growth curve modeling  
36

## 37 1. Introduction

38 From a psychological perspective, organizational life can be understood in terms of a chain of  
39 events [1]. Interestingly however, despite calls to take issues of time more seriously [2–4] researchers  
40 in the field of occupational health psychology have only recently begun to consider dynamics in  
41 relevant phenomena like employee strain and engagement [5] through the lens of work events [6].  
42 Work engagement has been described as “a positive, fulfilling, work-related state of mind that is  
43 characterized by vigor, dedication, and absorption” [7]. Work engagement has attracted  
44 considerable research interest within the last fifteen years [8–10]. In particular job characteristics

45 have been identified as major drivers of work engagement [5,9,10] and empirical evidence  
46 consistently shows that work engagement is determined by the interplay of different kinds of job  
47 characteristics (e.g., autonomy, workload) [11]. However, it has been suggested that to understand  
48 the experience of work and how it relates to employee outcomes like engagement, it is advisable to  
49 go beyond generalized perceptions of how a job usually is (i.e., job characteristics as measured in  
50 survey studies). More specifically, there is a need to consider dynamic aspects (i.e., fluctuation in job  
51 characteristics from day to day) [11,12] as well as factors more proximal to employee experiences  
52 over time [13]. Hence, a focus on enacted job characteristics, that is events and activities in the job as  
53 they happen [13], is warranted. Work events differ from features of the job in that they are “discrete  
54 and bounded in space and time” [1]. Therefore, the study of work events rather than job  
55 characteristics, provides the opportunity to add a temporal component to the research on job  
56 characteristics [5] and to focus on work events as more proximal antecedents of work engagement  
57 [12,13]. In other words, studying work events rather than job characteristics offers the opportunity to  
58 specify and examine how the different things that happen to employees at work overtime combine  
59 to affect work engagement. For instance, over the course of time employees are likely to experience a  
60 series of positive events (e.g., praise from the supervisor after successfully finishing an important  
61 task) and negative events (e.g., an episode of interpersonal conflict with colleagues). Although the  
62 occurrence of each of these events is associated with short-term fluctuation in work engagement in  
63 its own right [14], it is likely that last week’s work events carry over to affect work engagement still  
64 during the current workweek [15]. Furthermore, different work events may interact to predict work  
65 engagement. Put another way, receiving praise from one’s supervisor in this week’s team meeting  
66 will foster work engagement, but preceding events like positive feedback from the supervisor or  
67 interpersonal conflict with colleagues in the previous week may change the impact of the very same  
68 event [see 1]. Hence, it is worthwhile to consider work events embedded within a chain of events  
69 over time [16]. To account for the richness of the experience of work [17], we draw on a taxonomy of  
70 work events, which encompasses a broad range of relevant positive and negative work events [6].  
71 The taxonomy has been derived from qualitative research [6] and can be considered exhaustive with  
72 regard to the most relevant work events from the perspective of employees. The taxonomy provides  
73 an integrative framework covering a broad range of work events that have been considered in the  
74 literature so far (see [6] for a literature review). We leverage this taxonomy to examine which specific  
75 type of work event is most relevant to work engagement, besides the effects of positive and negative  
76 work events in general terms.

77 Above, we have outlined that an event-oriented approach permits specifying the order of what  
78 happens when and interactions among current events and recent events. Recently, Wickham and  
79 Knee [15] have proposed applying experience sampling data to analyze such interactions between  
80 current events and recent events to describe psychological processes of sensitization and satiation  
81 over time. For instance, in the case of sensitization, last week’s conflict makes the current week’s  
82 conflict seem worse. That is, employees become more vulnerable or susceptible to work events with  
83 each episode. Conversely, in the case of satiation, last week’s conflict makes this week’s conflict seem  
84 less threatening. In other words, employees become less vulnerable or susceptible to work events  
85 with each episode. We adopt this approach to examine sensitization and satiation to the study of  
86 both positive and negative events predicting work engagement. Furthermore, a positive event like  
87 praise from the supervisor may yield particularly strong effects on work engagement after a  
88 negative event has occurred [16,see 18,19]. Hence, we extend the sensitization-satiation perspective  
89 and scrutinize the interplay of positive events and negative events from one week to the next week.  
90 Interestingly, experiencing a set of events in a given order (i.e., conflict with colleagues after praise  
91 from the supervisor) may not be equivalent to the reverse order and it is likely to result in different  
92 levels of work engagement. However, theory and empirical research on job characteristics and work  
93 engagement so far have been largely focused on situational features work [11] and have rarely  
94 considered temporal issues in depth. Put another way, research on job demands and resources  
95 usually does not distinguish between experiencing a specific resource prior to or after being  
96 confronted with high levels of a specific job demand. Accordingly, in this study, we aim to account

97 for the order of positive and negative events and examine competing hypotheses. Given that job  
98 characteristics (demands and resources) are linked to work events as more proximal precursors of  
99 work engagement [12,13] our event-oriented temporal approach has implications beyond the study  
100 of work events per se. In this sense, the different types of work events correspond to immediate  
101 situational consequences of a broad range of job characteristics [12,13]. Hence, our research informs  
102 researchers interested in the interplay of job demands and job resources and may contribute to  
103 reconcile inconsistent findings on this interplay as well.

104 On a related note, it is important to gain insights into how frequent exposure to positive and  
105 negative events may accumulate to affect work engagement over longer periods of time [5,20,21].  
106 These insights are important as they pave the way to connect transient processes to longer-term  
107 processes underlying employee well-being [20]. In the study of work events, researchers have rarely  
108 gone beyond considering the cross-sectional associations or short-term effects of events over a  
109 couple of hours [see 6 for a review]. Hence, we know little about sustained effects due to the  
110 accumulation of negative or positive events over time. However, if work events do not have  
111 longer-term implications for individual outcomes, one may question their practical relevance [20].  
112 Conversely, studying accumulation effects may contribute to gain insights in how mundane events  
113 in the daily grind of work add up and lead to potentially profound changes in work engagement  
114 over time. We therefore conducted a week-level diary study over a period of four months, which fits  
115 these aims best: Capturing meaningful events shortly after they happen, but at the same time  
116 monitoring mid-term changes in work engagement applying an intensified longitudinal design.

117 Our study contributes to the literature in at least two ways. First, we consider sensitization and  
118 satiation to positive and negative events. In a similar vein, we study how positive and negative  
119 events combine to affect work engagement from week to week. In this sense, we follow the call for  
120 applying experience sampling data for analyzing the effects of work events within the context of a  
121 history of preceding events [1,15]. Second, we add a longitudinal perspective and consider whether  
122 the frequent occurrence of work events predicts mid-term trajectories in work engagement over four  
123 months.

#### 124 1.1. *What Happens in the Short Run: Work Events as Antecedents of Work Engagement*

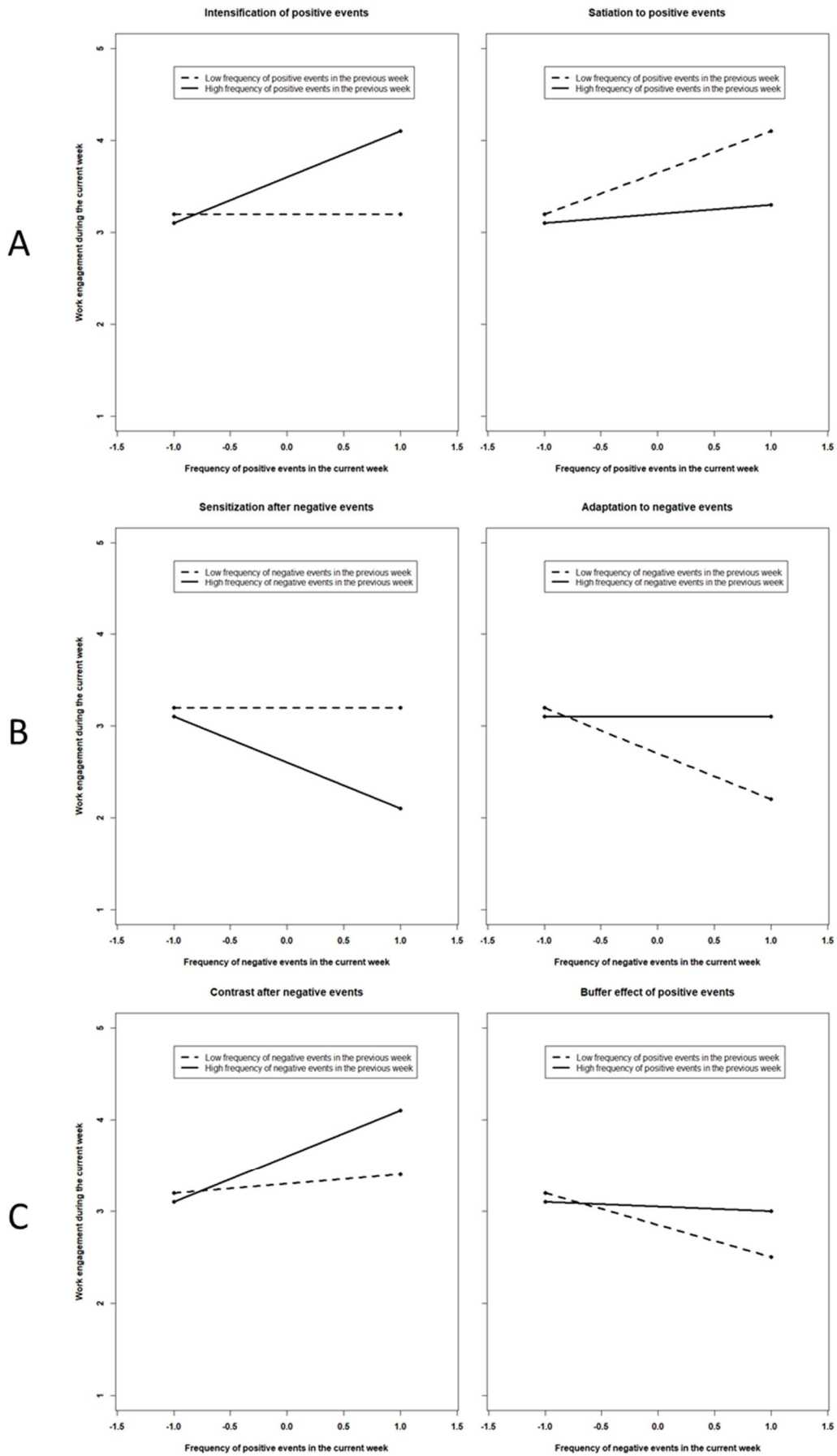
125 In recent years, evidence on antecedents of work engagement at the intraindividual level has  
126 started to accumulate [11]. However, links between work events and work engagement have rarely  
127 been considered explicitly. According to Weiss and Cropanzano [12] affective events are “things  
128 [that] happen to people in work settings” to which “people react emotionally” ( p. 11). From the  
129 perspective of conservation of resources theory [22] positive events signal the availability of  
130 resources or opportunities for resource gain [23]. Given that positive work events refer to  
131 experiences that either overlap in content with or are triggered by resources such as rewards or  
132 reinforcement [11,24,25], we assume that positive events at work are positively related to work  
133 engagement. Accordingly, positive work events, such as praise from the supervisor, predict work  
134 engagement within [18,26] and between individuals [25]. By contrast, negative events can be  
135 considered factors that detract attention and may inhibit engagement in the focal tasks [27]. So far,  
136 empirical evidence on negative events and work engagement has been mixed. One study has  
137 favored significant negative links between negative events and work engagement at the day-level  
138 [14,see also 18]. By contrast, other researchers found negligible lagged associations with work  
139 engagement [28]. Their results suggest no lagged main effects of previous day-positive event  
140 intensity on work engagement the next day. Moreover, in some studies negative events  
141 paradoxically even yielded beneficial lagged effects on job satisfaction [16] and work engagement  
142 [18]. More specifically, these studies suggest that we need to account for what happens in the  
143 aftermath of the focal events. Events probably do not affect employee well-being in isolation and it is  
144 unlikely that “participants in diary studies ... become a tabula rasa once they have completed the  
145 diary report for a given interval” [15]. Therefore, in this study, we add a temporal component and  
146 consider work events embedded in a series of events that may happen to an employee over time  
147 [1,16]. For one, we take into account that recent events may carry over from one week to the next

148 week to affect work engagement. For the other, we consider how past events affect the impact of  
149 current work events. Given that there are concurring views of how the interplay of work events  
150 might look like, we derive and state competing hypotheses. Prototypical patterns of interactions are  
151 depicted in Figure 1. Panel A refers to prototypical patterns of work engagement which may arise  
152 from the interaction of current x lagged positive events. Panel B describes prototypical patterns for  
153 interactions of current x lagged negative events. Finally, Panel C illustrates how positive events and  
154 negative events may combine over time to affect work engagement. Given that we aim to extend the  
155 perspective beyond prior day-level research, we focus on links and interactions at the week-level – a  
156 time frame rarely applied to work events. This approach appears adequate, because the seven-day  
157 week is a salient unit for structuring time [29]. Furthermore, associations from week to week tap into  
158 less transient and more profound effects over time [30].

### 159 1.2. Temporal Patterns of Positive Events

160 While the concurrent association between positive events and work engagement is  
161 well-established [18,14,25,26,see also 28], the carryover effects of positive events on work  
162 engagement have rarely been considered [see 28 for the only exception]. However, their study was  
163 focused on negative event intensity and several features of their design (e.g., events sampled on  
164 three consecutive day three days only, time frame of focal measures referred to the day level), their  
165 measures (e.g., affective reaction to events vs. frequency of events as predictor), and their focal  
166 analyses (e.g., coefficients for positive events when controlling for several other aspects) prevent us  
167 from drawing strong conclusions regarding lagged effects of positive events per se. Basically, there  
168 are two perspectives: First, positive events experienced in the course of the previous workweek may  
169 linger on to affect work engagement in the current week, for instance by means of positive reflection  
170 (e.g., about successfully finishing a project) [31] or capitalization on the same event through social  
171 sharing with others [32]. Second, positive events from the previous workweek may change the way  
172 current positive events are perceived and experienced. To investigate these temporal processes,  
173 Wickham and Knee [15] have suggested applying interactions of current events (concurrent) and  
174 more recent events (lagged) to experience sampling data. As illustrated in Panel A of Figure 1, there  
175 are two prototypical patterns of the interaction. On the one hand, employees may get used to high  
176 frequencies of positive events. For instance, research on the hedonic treadmill suggests that  
177 individual standards may change and positive events will be taken for granted, when positive  
178 events have occurred frequently before [33]. That is, in the light of many positive events in the  
179 previous week, currently high frequencies of positive events have a reduced impact on work  
180 engagement. Throughout this manuscript, we label this pattern satiation effect (right side of Panel A  
181 in Figure 1). On the other hand, positive events in the past may contribute to benefit even more from  
182 current positive events, as positive events broaden awareness for positive events which might follow  
183 [34]. Throughout this manuscript, we label this pattern intensification effect (right side of Panel A in  
184 Figure 1). Positive events may even trigger behaviors of the individual that provoke positive events  
185 in the future [see 35]. Given that there are competing theoretical views and prior empirical results do  
186 not allow for firm conclusions, we state two competing hypotheses for satiation vs. intensification  
187 effects:

188 **Hypothesis 2.** *Concurrent positive events in week n and lagged positive events in week n-1 interact to predict*  
189 *work engagement in week n. Lagged positive events (a) amplify (intensification) or (b) alleviate the effect of*  
190 *concurrent positive events (satiation).*



191

192

Figure 1. Prototypical ways of how work events may interact to predict work engagement

### 193 1.3. Temporal Patterns of Negative Events

194 The rationale regarding sensitization and satiation effects presented above can also be applied  
195 to negative events. Prototypical patterns of work engagement are illustrated in Panel B of Figure 1.  
196 Negative work events in the previous workweek may affect employees even after a couple of days  
197 have passed [36,see also 28]. So, negative events in the current workweek may shift attention to  
198 negative cues in the environment and make employees react more sensitively to negative events  
199 during the next workweek [21,see also 37]. In line with this perspective, [38] found that individuals  
200 reacted more sensitive to negative social events on a given day, when negative events had preceded  
201 the day before. A prototypical pattern of work engagement is depicted on the left side of Panel B in  
202 Figure 1. Throughout this manuscript we label this pattern sensitization effect.

203 By contrast, from the perspective of the allostatic load model [39], it is also plausible that  
204 employees will adapt to negative events and will not mind negative events, when they re-occur. This  
205 may be because employees might become more proficient in dealing with negative events [40] or  
206 become more resilient due to having been challenged before [41]. Throughout this manuscript, we  
207 label this pattern adaptation [42]. In sum, negative events in the previous workweek, may make  
208 employees either more susceptible to the detrimental effects of negative events (sensitization) or  
209 may contribute to adapting to negative events (adaptation, see right side of Panel B in Figure 1).  
210 Again, we state two competing hypotheses:

211 **Hypothesis 2.** *Concurrent negative events in week  $n$  and lagged negative events in week  $n-1$  interact to*  
212 *predict work engagement in week  $n$ . Lagged negative events (a) amplify (sensitization) or (b) reduce the effect of*  
213 *concurrent negative events (adaptation).*

### 214 1.4. The Interplay of Positive and Negative Events over Time

215 Beyond sensitization and satiation effects, our study addresses the question of whether  
216 experiencing positive events in the aftermath of negative events results in different levels of work  
217 engagement than experiencing positive events after a period of few positive events. Above we have  
218 discussed that positive events in the previous week may broaden awareness for and strengthen the  
219 impact of current positive events. In a similar way, negative events in the past may also change the  
220 way current positive events are perceived. For instance, experience sampling research on work  
221 events and after work fatigue suggest that employees benefit most from positive events in the face of  
222 negative events and in the face of chronically high job demands [19]. Other researchers have argued  
223 that work engagement results from a shift in affect in the aftermath of negative events – that is  
224 down-regulation of negative affect and up-regulation of positive affect [18]. Empirically these  
225 authors found that negative events enhance, rather than impair work engagement, when followed  
226 by high levels of positive affect. Given that prior research is mute on the triggers of affective shift  
227 and the beneficial effects on work engagement, we consider positive work events as predictors,  
228 because positive events have consistently been linked to positive affective outcomes [6]. Positive  
229 events in the aftermath of negative events may be particularly beneficial for work engagement,  
230 because positive events create a contrast effect at the backdrop of prior negative events [43,44,see  
231 also 19]. Accordingly, and in line with the contrast after negative events perspective, we expect that  
232 negative events in the past and current positive events interact to predict work engagement. A  
233 prototypical pattern of work engagement is depicted on the left side of Panel C in Figure 1.  
234 Throughout this manuscript we label this pattern contrast effect. More specifically, we expect that  
235 positive events in the aftermath of negative events will have a particularly strong effect on work  
236 engagement:

237 **Hypothesis 3.** *Concurrent positive events in week  $n$  and lagged negative events in week  $n-1$  interact to*  
238 *predict work engagement in week  $n$ . Lagged negative events amplify the effect of positive events (contrast effect*  
239 *after negative events).*

240 To gain a more complete picture of how positive and negative events interact over time, we  
241 need to consider whether positive events in the past change the impact of current negative events.  
242 We argue, that positive events in the previous workweek may also contribute to build up personal  
243 resources [23,24] which change the way current negative events affect work engagement. For  
244 instance, high frequencies of positive events in the previous workweek are associated with positive  
245 affect [6] and may therefore replenish coping resources [45]. In this sense positive events likely  
246 strengthen self-efficacy [46] and self-regulation capacity [47] as personal resources [see for instance  
247 48]. Hence, after experiencing positive events in the previous workweek employees may be  
248 well-equipped to face negative events in the current week. In line with this idea, [14] found that  
249 habitual acceptance as a personal resource buffers the detrimental effects of negative events on work  
250 engagement at the day-level. Given that positive events likely feed personal resources and resources  
251 in turn attenuate the detrimental effects of negative events on work engagement, we assume that  
252 positive events in the previous workweek attenuate the impact of negative events in the current  
253 week. Throughout this manuscript we label this pattern buffering effect. A prototypical pattern of  
254 work engagement is depicted on the right side of Panel C in Figure 1.

255 **Hypothesis 4.** *Concurrent negative events in week  $n$  and lagged positive events in week  $n-1$  interact to*  
256 *predict work engagement in week  $n$ . Lagged positive events attenuate the effect of current negative events*  
257 *(buffering effect).*

#### 258 1.5. *What Happens in the Long Run: Sustained Effects of Work Events Over Time*

259 Recently, Ilies, Aw, et al. (2015) have reviewed theory and empirical evidence on  
260 intraindividual models of well-being and noted that we need to connect transient processes (as  
261 reflected in fluctuations in well-being from day to day) to longer-term processes (as reflected in  
262 changes in well-being over periods of weeks, months, or years). If applied research provides  
263 evidence that, for instance, positive events are associated with sustained changes in work  
264 engagement over longer periods of time these findings would underscore the practical relevance of  
265 these concepts in organizations from a practitioner's point of view. Whereas associations at the day-  
266 or week-level may reflect fluctuations around characteristic average levels that might be largely  
267 stable over time [see also 33], sustained effects address the issue of whether work events indeed  
268 yield chronically beneficial effects [20]. Given that prior intraindividual research has not considered  
269 this aspect empirically, we examine whether frequent exposure to positive and negative events is  
270 associated with mid-term changes in work engagement over time at the interindividual level.

271 Drawing on conservation of resources theory [22], it has been suggested that work engagement  
272 results from resource abundance [49,50]. According to Halbesleben and colleagues [24] positive  
273 aspects in organizational settings like social support, justice, or trust act as signals that the  
274 "investment of resources will help the individual realize his or her goal of achieving more  
275 resources." (p. 1347). Given that positive events tap into these kinds of signals, we assume that a  
276 high frequency of such signals over time is associated with gains in work engagement. The frequent  
277 experience of positive events over time should accumulate to feed higher levels of work  
278 engagement. In other words, trajectories of work engagement should be more positive (steeper  
279 increase) when positive events occur frequently compared to when positive events occur  
280 infrequently.

281 **Hypothesis 5.** *Trajectories in work engagement differ between persons dependent upon the frequency of*  
282 *positive events over time. Higher (lower) frequencies of positive events are associated with steeper (flatter)*  
283 *increases in work engagement.*

284 Given the pioneering nature of our study with regard to mid-term trajectories of work  
285 engagement dependent upon accumulation of work events, we do not state a formal hypothesis on  
286 the effects the frequency of negative events over time might have. However, we do investigate the  
287 concurrent effects of frequency of negative events within our focal analyses on the accumulation of

288 positive events. Our analyses, therefore, also provide insights into the relative importance of positive  
289 vs. negative events for work engagement in the long run

## 290 **2. Materials and Methods**

### 291 *2.1. Procedure*

292 Drawing on the rationale outlined above we conducted a week-level diary study across a  
293 period of four months. Participants filled in a general survey containing demographics and other  
294 variables assumed to be largely stable across time. After registering for the study and filling out the  
295 general survey participants received emails inviting them to complete short diary questionnaires  
296 across a period of fifteen consecutive weeks with two questionnaires per week. The procedure and  
297 materials of this study have not undergone examination by an ethics committee, as the measures and  
298 procedures of our study followed the protocols of standard self-report experience sampling research  
299 in applied psychology, and we did not touch sensitive topics (like e. g. sexual orientation). Our study  
300 fully complied with the standards of the Department of Psychology at the University of Hagen,  
301 which included strict guidelines to guarantee anonymity of the self-reported data. Individuals  
302 interested in participating in our study were informed about the general aims and the protocol of the  
303 study before their participation. Our protocol did not include any form of deception of participants.  
304 Participation was voluntary and participants had the opportunity to quit whenever they wanted.

### 305 *2.2. Sample*

306 Our 135 participants were employees who were enrolled in a psychology distance learning  
307 program at a German university that offers these courses primarily for individuals who study  
308 besides their regular jobs and occupations. Participants received course credit for filling out the  
309 general survey and the diary questionnaires. Credit was commensurate with the number of  
310 completed weekly surveys and participants, who completed ten or more surveys received some  
311 extra credit.

312 Seventy-seven percent of our participants were female. Average age was 35.41 years ( $SD = 9.93$ ),  
313 ranging from 18 to 61 years. Tenure within the organization ranged from less than one year to 28  
314 years ( $M = 6.79$ ,  $SD = 7.34$ ). Participants came from diverse industries, mainly from healthcare (19%),  
315 the service sector (16%), education (10%), and commerce (9%). Participants had either full-time or  
316 part-time jobs and worked on average 32.18 hours per week ( $SD = 9.92$ ), 75% had a permanent  
317 contract and 29% had a leadership position. In total, we received 849 observations (person-weeks)  
318 for Friday from 135 persons (on average 6.3 weeks per person, 42% of the theoretically possible 2025  
319 observations) suited for use in our growth curve models. Our analyses of short-term lagged effects  
320 from one week to the next week, however, relied on matched observations from two consecutive  
321 weeks. Given that participants had missing data for single or several weeks over the course of 15  
322 weeks, our analyses of the short-term effects were based on a sample of 490 matched observations  
323 from 101 employees. Descriptive information and zero-order correlations for the full sample and the  
324 matched sample at the intraindividual level and at the interindividual level are presented in Tables 1  
325 and 2, respectively.

### 326 *2.3. Measures*

327 We applied short versions of validated scales adapted to the purposes of our study. Participants  
328 rated aspects on 5-point Likert scales to indicate the frequency of experiences during the recent  
329 workweek. Unless stated otherwise, response options ranged from 1 ("never during this week") to 5  
330 ("several times a day").

331 *2.3.1. Positive work and negative work events during the workweek.*



332 We measured work events within the recent workweek on Friday afternoon using eleven items  
333 from the work events checklist which covers the work events clusters identified by Ohly and Schmitt  
334 [6]. The work event checklist consists of 13 items, two of which refer to events not directly related to  
335 the job (negative events: bad news in employees' private lives and health problems). Given the focus  
336 and theoretical rationale of the present study, we confined analyses a set of eleven items, which were  
337 explicitly job-related. However, we included the off-job events in the supplemental analyses. Five  
338 items tapped into positive events during the current workweek. Sample items are "Did you get  
339 confronted with positive but unexpected news or information (e.g., a promotion or a new work  
340 order)?" and "Did you receive a positive feedback or a thank from anyone (e.g., supervisor,  
341 colleagues or customers)?" We applied six items to capture negative events within the recent  
342 workweek. Sample items are, "Did you experience any conflicts or communication problems with  
343 colleagues?" and "Did you experience a situation that negatively affected the working climate and  
344 the cooperation among the employees/colleagues in your department/your company (e.g., dismissal  
345 of a colleague, issues dealing with the supervisor, unsuccessful team meetings)?" Given that work  
346 events are formative rather than reflective constructs coefficient alphas are not adequate for judging  
347 reliability [51]. For instance, experiencing high levels of conflicts does not necessarily imply high  
348 levels of ambiguity or organizational changes at the same time.

### 349 2.3.2. Work engagement during the workweek.

350 We applied a brief three item measure to capture work engagement based on the UWES-9 items  
351 (Utrecht Work Engagement Scale) [52]. Preliminary analyses based on cross-sectional data from the  
352 baseline survey of the present study using the UWES-9 items (Utrecht Work Engagement Scale) [52]  
353 suggested that all items loaded on one factor [see 53 on the structure of the UWES] and in our study  
354 the three highest loading items captured engagement as reliable as the UWES-9 in our baseline  
355 survey ( $r_{UWES9-UWES3} = .97$ ). We applied the following items: "During this week, I was  
356 enthusiastic about my job.", "During this week, I was immersed in my work.", and "During this  
357 week, I got carried away when I was working.". We calculated multilevel alpha for work  
358 engagement following procedures introduced by [54] implemented in R by [55]. Alphas for work  
359 engagement were .84 at the intraindividual level and .96 at the interindividual level.

### 360 2.4. Analytic Strategy

361 We applied multilevel modelling [56] to account for dependence of repeated observations. We  
362 applied the "nlme"- package for R [57]. As weekly observations were nested within persons, we  
363 specified two-level models. Work engagement yielded an intra-class correlation coefficient (ICC(1))  
364 of .61. In our focal analyses predictors at the week-level (Level-1) were centered around the  
365 person-mean [58]. Given that we expected relationships between predictors and criteria to vary  
366 across persons, we specified random effects for all focal predictors. We controlled for the Level  
367 2-effects of our focal predictors [59,60] [see also 15] and entered the person-means of positive and  
368 negative events for each person to predict the intercept of work engagement. The person-mean of  
369 positive or negative events captures the amount of work events experienced over the period of 15  
370 weeks. Including the person-mean of positive and negative work events at Level 2 offers the  
371 advantage of being able to differentiate between differences at the interindividual level and the focal  
372 short-term effects at the intraindividual level [61]. Our model is equivalent to what Kreft et al. call a  
373 CWC2 model [62].

374 To analyze mid-term effects of the frequent exposure to work events over time, we specified  
375 growth curve models using multilevel modeling. We followed the steps recommended by [63] for  
376 growth curve modeling using a multilevel modeling approach in R. We specified linear changes  
377 (decrease or increase) in work engagement over time as a random slope of time in weeks predicting  
378 these outcomes. Significant random effects indicate that employees differ in the rate of change in the  
379 respective outcome variable. We also probed quadratic and cubic trajectories for exploratory  
380 purposes. We then added the person-means of positive and negative work events as cross-level

381 moderators, which tests whether differences in the trajectory of work engagement (slope of time) can  
382 be explained by the amount of positive and negative events experienced by each person over time.  
383 Whereas the person-means as covariates depict differences in characteristic average levels of work  
384 engagement due to frequent exposure to work events, the trajectories can be interpreted as increases  
385 or decreases in weekly work engagement over time.

### 386 3. Results

387 In a first step, we examined whether each type of positive and negative work events had  
388 occurred or not (once or several times vs. not at all during the workweek) and how frequently these  
389 events had occurred over the course of the 15 weeks. With regard to positive events we found that  
390 positive events occurred more frequently than negative events. Positive events ranged from more  
391 than 335 occurrences (work-related good news) to more than 828 occurrences (goal attainment,  
392 problem-solving and task-related success). Negative events ranged from more than 327 occurrences  
393 (problems in interactions with clients) to more than 460 occurrences (ambiguity, insecurity, and loss  
394 of control). Average frequencies for each type of event are displayed in Table 1 for descriptive  
395 purposes. Whereas positive events occurred on average several times a week, negative events  
396 occurred on average less than once a week during the period studied.

#### 397 3.1. Short-Term Effects of Work Events

398 Addressing the first set of hypotheses, we specified Model 1, in which work engagement (in  
399 week  $n$ ) was regressed on the main effects of concurrent (week  $n$ ) and lagged work events  
400 (week  $n-1$ ), the interactions among positive events (satiation or intensification) and among negative  
401 events (adaptation or sensitization). We found that models including auto-regressive and  
402 heteroscedasticity specification did not improve model fit [63] and did not alter the pattern of  
403 results. Therefore, we omitted these specifications from the focal models. Results are depicted in  
404 Table 3. We found a positive relationship between positive events during the workweek and work  
405 engagement ( $\gamma = .74$ ,  $t = 12.52$ ,  $p < .001$ ) at the intraindividual level. Concurrent negative events were  
406 unrelated to work engagement ( $\gamma = .07$ ,  $t = .86$ ,  $p > .10$ ). We did not find evidence for lagged main  
407 effects of work events from week  $n-1$  to week  $n$ . That is, neither positive nor negative events carried  
408 over to affect work engagement from one week to the next. Furthermore, concurrent positive events  
409 did not interact with lagged positive events ( $\gamma = -.07$ ,  $t = -.61$ ,  $p > .10$ ). Hence, in contrast to  
410 Hypothesis 1 we found neither sensitization nor satiation effects of positive events. In a similar way  
411 concurrent negative events did not significantly interact with lagged negative events to predict work  
412 engagement ( $\gamma = -.07$ ,  $t = -.07$ ,  $p > .10$ ). Hence, in contrast to Hypothesis 2 we found neither  
413 sensitization nor satiation effects of negative events. Repeated exposure to positive events does not  
414 change the way positive events affect work engagement in the next week. The same is true for  
415 negative events.

**Table 1.** Correlations Among Study Variables at the Intraindividual Level

Variable	ICC	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Goal attainment, problem-solving, task-related success	.40	<b>.60</b>	<b>.28</b>	<b>.39</b>	<b>.45</b>	-.06	.05	<b>.07</b>	-.04	-.06	.01	<b>.74</b>	-.01	<b>.38</b>	
2. Perceived competence in or through social interactions	.47	<b>.62</b>	<b>.25</b>	<b>.41</b>	<b>.56</b>	-.02	-.07	.03	-.05	<b>-.16</b>	<b>-.12</b>	<b>.77</b>	<b>-.10</b>	<b>.45</b>	
3. Work-related good news	.30	<b>.28</b>	<b>.23</b>	<b>.27</b>	<b>.36</b>	-.03	.03	.04	<b>.09</b>	-.02	-.02	<b>.56</b>	.03	<b>.23</b>	
4. Passively experienced positive events	.46	<b>.40</b>	<b>.40</b>	<b>.27</b>	<b>.54</b>	-.02	<b>-.09</b>	<b>-.07</b>	<b>-.15</b>	<b>-.18</b>	<b>-.25</b>	<b>.76</b>	<b>-.20</b>	<b>.45</b>	
5. Praise, appreciation, positive feedback	.44	<b>.50</b>	<b>.60</b>	<b>.35</b>	<b>.56</b>	-.02	<b>.07</b>	-.02	.04	<b>-.10</b>	<b>-.09</b>	<b>.82</b>	-.02	<b>.43</b>	
6. Technical difficulties, problems with work tools and equipment	.45	-.07	.00	-.05	.02	.00	<b>.07</b>	.05	<b>.18</b>	<b>.26</b>	<b>.15</b>	-.04	<b>.46</b>	<b>-.13</b>	
7. Hindrances in goal attainment, obstacles in completing work tasks, overload	.39	<b>.12</b>	-.02	.03	-.08	<b>.13</b>	.01	<b>.36</b>	<b>.44</b>	<b>.33</b>	<b>.23</b>	.00	<b>.67</b>	-.04	
8. Problems in interactions with clients or patients	.41	.05	.00	.00	-.06	-.03	.00	<b>.39</b>	<b>.20</b>	<b>.30</b>	<b>.22</b>	.01	<b>.54</b>	.04	
9. Ambiguity, insecurity, loss of control	.45	-.04	-.03	<b>.10</b>	<b>-.13</b>	.08	<b>.18</b>	<b>.44</b>	<b>.18</b>	<b>.45</b>	<b>.37</b>	-.04	<b>.71</b>	<b>-.15</b>	
10. Conflicts and communication problems	.43	-.07	<b>-.16</b>	.00	<b>-.16</b>	-.06	<b>.27</b>	<b>.35</b>	<b>.37</b>	<b>.43</b>	<b>.51</b>	<b>-.15</b>	<b>.74</b>	<b>-.13</b>	
11. Managerial and internal problems, organizational climate	.49	.05	<b>-.10</b>	.03	<b>-.23</b>	-.04	<b>.10</b>	<b>.27</b>	<b>.26</b>	<b>.33</b>	<b>.46</b>	<b>-.14</b>	<b>.64</b>	<b>-.15</b>	
12. Positive events	.53	<b>.75</b>	<b>.77</b>	<b>.54</b>	<b>.76</b>	<b>.84</b>	-.02	.05	-.02	-.01	<b>-.13</b>	<b>-.10</b>	<b>-.09</b>	<b>.54</b>	
13. Negative events	.57	<b>.02</b>	-.08	.03	<b>-.17</b>	.03	<b>.43</b>	<b>.69</b>	<b>.55</b>	<b>.70</b>	<b>.74</b>	<b>.63</b>	-.05	<b>-.15</b>	
14. Work engagement	.61	<b>.31</b>	<b>.42</b>	<b>.18</b>	<b>.37</b>	<b>.36</b>	<b>-.12</b>	-.04	.07	<b>-.17</b>	<b>-.09</b>	<b>-.11</b>	<b>.45</b>	<b>-.13</b>	
15. Work engagement (lagged)	--	<b>.42</b>	<b>.48</b>	<b>.24</b>	<b>.46</b>	<b>.42</b>	<b>-.13</b>	-.01	<b>.09</b>	<b>-.17</b>	-.08	-.08	<b>.56</b>	<b>-.11</b>	<b>.67</b>

Note. Correlations above the diagonal are week-level correlations in the full sample ( $k = 849$ ). Correlations below the diagonal are week-level correlations in the matched sample ( $k = 490$ ). Correlations in bold type are significant at  $p < .05$ .

**Table 2.** Means, Standard Deviations, and Correlations Among Study Variables at the Interindividual Level

	Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.	Gender <sup>ab</sup>	.77	.42		-.06	.02	.03	.02	.00	.09	-.07	-.12	-.05	.04	-.01	-.03	.04	-.06	.02
2.	Age in years <sup>b</sup>	35.75	10.38	-.01		-.06	.13	.04	.06	-.04	-.01	.00	-.04	<b>-.28</b>	-.15	-.14	.04	-.16	.11
3.	Goal attainment, problem-solving, task-related success	3.17	0.87	.15	-.04		<b>.53</b>	<b>.38</b>	<b>.44</b>	<b>.37</b>	<b>-.13</b>	<b>-.19</b>	.07	-.14	-.14	-.10	<b>.69</b>	-.16	<b>.45</b>
4.	Perceived competence in or through social interactions	3.37	0.86	.12	.10	<b>.72</b>		<b>.39</b>	<b>.51</b>	<b>.64</b>	-.05	<b>-.22</b>	.09	<b>-.19</b>	<b>-.23</b>	<b>-.22</b>	<b>.82</b>	<b>-.21</b>	<b>.48</b>
5.	Work-related good news	1.53	0.75	-.03	.03	<b>.41</b>	<b>.40</b>		<b>.41</b>	<b>.49</b>	-.05	<b>-.17</b>	.07	-.04	-.05	-.11	<b>.67</b>	-.09	<b>.50</b>
6.	Passively experienced positive events	2.59	1.11	.05	.07	<b>.49</b>	<b>.59</b>	<b>.36</b>		<b>.61</b>	-.08	<b>-.17</b>	.02	<b>-.29</b>	<b>-.23</b>	<b>-.34</b>	<b>.80</b>	<b>-.27</b>	<b>.67</b>
7.	Praise, appreciation, positive feedback	2.47	1.03	.05	.04	<b>.45</b>	<b>.68</b>	<b>.51</b>	<b>.72</b>		-.12	<b>-.22</b>	-.02	-.10	<b>-.26</b>	<b>-.20</b>	<b>.83</b>	<b>-.23</b>	<b>.63</b>
8.	Technical difficulties, problems with work tools and equipment	1.76	0.98	-.02	-.07	-.16	<b>-.32</b>	.01	-.18	-.19		<b>.28</b>	<b>.18</b>	<b>.27</b>	<b>.43</b>	<b>.34</b>	-.11	<b>.61</b>	<b>-.23</b>
9.	Hindrances in goal attainment, obstacles in completing work tasks, overload	1.85	1.1	-.10	-.07	<b>-.21</b>	<b>-.29</b>	-.10	<b>-.24</b>	-.14	<b>.36</b>		<b>.42</b>	<b>.48</b>	<b>.42</b>	.15	<b>-.25</b>	<b>.67</b>	-.13
10.	Problems in interactions with clients or patients	1.56	0.82	.00	-.05	-.06	-.14	.04	-.19	-.17	.16	<b>.46</b>		<b>.21</b>	<b>.30</b>	<b>.18</b>	.06	<b>.53</b>	-.06
11.	Ambiguity, insecurity, loss of control	1.9	0.98	-.03	<b>-.27</b>	-.15	<b>-.29</b>	.00	<b>-.37</b>	-.19	<b>.45</b>	<b>.56</b>	<b>.30</b>		<b>.58</b>	<b>.52</b>	<b>-.21</b>	<b>.76</b>	<b>-.22</b>
12.	Conflicts and communication problems	1.6	0.83	-.07	-.18	-.16	<b>-.40</b>	.01	<b>-.34</b>	<b>-.31</b>	<b>.59</b>	<b>.55</b>	<b>.39</b>	<b>.67</b>		<b>.67</b>	<b>-.25</b>	<b>.83</b>	<b>-.26</b>
13.	Managerial and internal problems, organizational climate	1.63	0.92	-.09	-.15	-.11	<b>-.33</b>	-.06	<b>-.47</b>	<b>-.28</b>	<b>.38</b>	<b>.28</b>	<b>.24</b>	<b>.65</b>	<b>.65</b>		<b>-.26</b>	<b>.71</b>	<b>-.27</b>
14.	Positive events	2.63	0.68	.09	.05	<b>.77</b>	<b>.86</b>	<b>.64</b>	<b>.82</b>	<b>.86</b>	<b>-.22</b>	<b>-.25</b>	-.14	<b>-.27</b>	<b>-.32</b>	<b>-.33</b>		<b>-.26</b>	<b>.72</b>
15.	Negative events	1.72	0.59	-.08	-.19	<b>-.20</b>	<b>-.40</b>	-.03	<b>-.41</b>	<b>-.29</b>	<b>.68</b>	<b>.72</b>	<b>.55</b>	<b>.83</b>	<b>.88</b>	<b>.74</b>	<b>-.35</b>		<b>-.29</b>
16.	Work engagement	2.42	1.05	.01	.09	<b>.50</b>	<b>.61</b>	<b>.45</b>	<b>.70</b>	<b>.66</b>	<b>-.27</b>	-.12	-.10	<b>-.28</b>	<b>-.27</b>	<b>-.33</b>	<b>.75</b>	<b>-.32</b>	

Note. Correlations above the diagonal are person-level correlations in the full sample (n = 135). Correlations below the diagonal are person-level correlations in the matched sample

(n = 101). Correlations in bold type are significant at  $p < .05$ .

<sup>a</sup> 0 male, 1 female; <sup>b</sup> for gender and age  $N = 131$  (full sample) and  $N = 99$  (matched sample)

**Table 3.** Results from Multilevel Analysis Predicting Work Engagement

Parameter	Model 1			Model 2			
	$\gamma$	SE	t	$\gamma$	SE	t	
Level 2 (person-level)							
Intercept	2.44	0.07	33.62	2.43	0.07	33.50	
Person-mean positive events	1.21	0.13	9.64	1.21	0.12	9.70	***
Person-mean negative events	-0.12	0.13	-0.92	-0.13	0.13	-0.97	
Level 1 (week-level)							
Time	0.00	0.01	0.33	0.00	0.01	0.43	
Positive events (lagged week n-1)	0.03	0.06	0.49	0.03	0.06	0.57	
Negative events (lagged week n-1)	0.02	0.08	0.24	-0.02	0.08	-0.20	
Positive events (week n)	0.74	0.06	12.52	0.72	0.06	12.12	***
Negative events (week n)	0.07	0.08	0.86	0.06	0.08	0.77	
Interactions							
Positive events x lagged positive events	-0.07	0.11	-0.61	-0.09	0.12	-0.76	
Negative events x lagged negative events	-0.02	0.20	-0.07	-0.05	0.20	-0.24	
Positive x lagged negative events				0.40	0.15	2.69	**
Negative events x lagged positive				0.10	0.17	0.59	
Variance components							
Level 2 intercept variance	0.32			0.33			
Positive events slope variance	0.01			0.02			
Negative events slope variance	0.02			0.01			
Lagged negative events slope variance	0.06			0.06			
Level 1 intercept variance	0.26			0.25			
Deviance (df)		920.43	(21)		913.27	*	(23)
AIC		962.43			959.27		
BIC		1050.51			1055.74		

Note. SE = standard error. df = degrees of freedom. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ . Deviance = (-2 Residual Log Likelihood). AIC = Akaike information criterion. BIC = Bayesian information criterion

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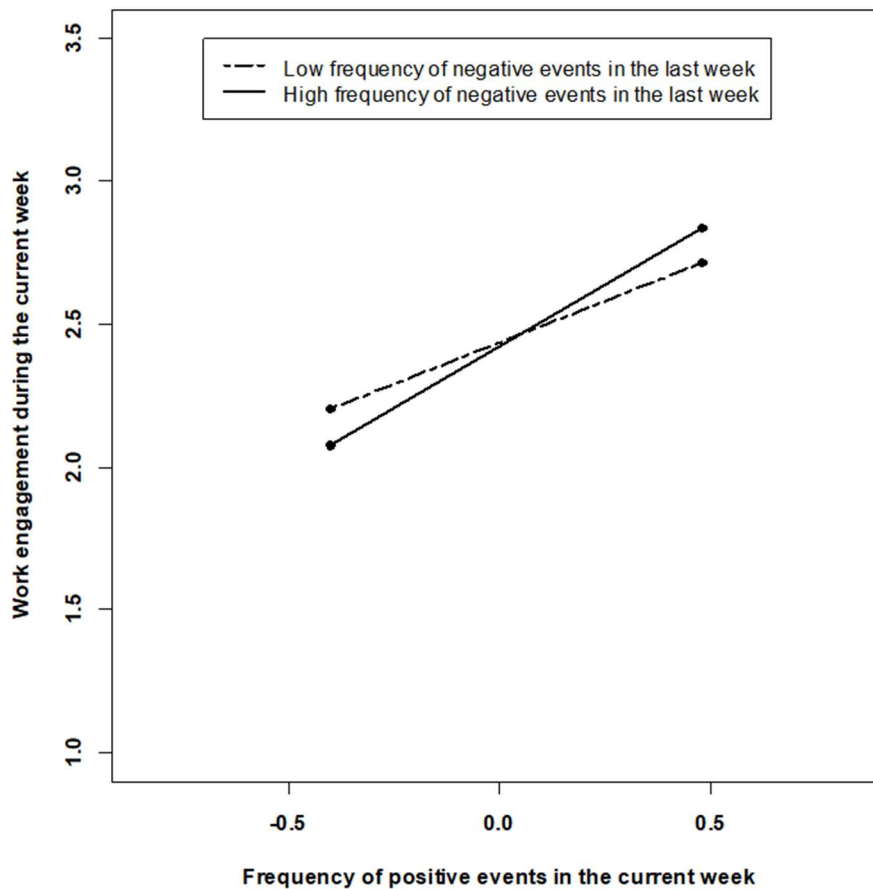
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Addressing Hypothesis 3 (contrast after negative events) and 4 (buffering effect) we examined the interactions of lagged negative events x current positive events and of lagged positive events x current negative events. In line with Hypothesis 3, we found that lagged negative events and concurrent positive events interact to predict work engagement ( $\gamma = -39$ ,  $t = 2.36$ ,  $p = .008$ ). The pattern of the interaction is depicted in Figure 2 and suggests that frequent negative events in the last week amplify the positive association between positive events and work engagement in the current week (Simple slopes:  $\gamma$  low negative events = .60,  $t = 7.70$ ,  $p < .001$ ,  $\gamma$  high negative events = .86,  $t = 11.41$ ,  $p < .001$ ). Gains in work engagement at the week-level due to positive events are greatest in weeks when many negative events have preceded in the week before. In contrast to Hypothesis 4, lagged positive events did not change the effects of concurrent negative events ( $\gamma = .11$ ,  $t = .67$ ,  $p > .10$ ). In sum, our results are compatible with the basic idea of a contrast effect after negative events. However, we did not find evidence for sensitization or satiation effects across weeks.



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435

**Figure 2.** Interaction of current positive and lagged negative events at the week-level

### 436 3.2. Mid-Term Changes in Work Engagement Due to Work Events

437 Results from linear growth curve models predicting changes in work engagement over time are  
 438 shown in Table 4 (Growth Model 1). In a first step, we found a significant negative effect of time  
 439 ( $\gamma = -.01$ ,  $t = -2.05$ ,  $p = .04$ ), indicating that on average work engagement slightly decreases over the  
 440 period of four months. Given that we found significant slope variance, we considered the frequency  
 441 of positive and negative events over time as cross-level moderators in Growth Model 2. In line with  
 442 Hypothesis 5, positive events were predictive of the slope of time ( $\gamma = .03$ ,  $t = 1.97$ ,  $p = .04$ ). In  
 443 contrast, negative events did not contribute to explain slopes in work engagement over time ( $\gamma =$   
 444  $-.02$ ,  $t = -1.13$ ,  $p > .10$ ). The trajectories of work engagement over the course of time dependent upon  
 445 accumulation of positive events are depicted in Figure 3. Inspection of the slopes reveals that lower  
 446 frequencies of positive events over time are related to steeper decreases in work engagement over  
 447 time, whereas work engagement remains constant when high frequencies of positive events occur.  
 448 Further inspection of simple slopes using tools developed by [64] suggests that work engagement  
 449 decreases when the frequency of positive events over time is close to the grand-mean or below and  
 450 that work engagement might even increase when very high frequencies of positive events are  
 451 present (region of significance  $-.01 > w > 1.57$ ) (Simple slopes:  $\gamma$  low positive events =  $-.03$ ,  $t = 2.97$ ,  $p <$   
 452  $.01$ ,  $\gamma$  high positive events =  $-.00$ ,  $t = .04$ ,  $p > .10$ ). Besides the trajectories over time, the  
 453 person-mean of positive events was also predictive of the intercept ( $\gamma = .98$ ,  $t = 8.36$ ,  $p < .001$ ). That is,  
 454 differences in individual “characteristic average levels” [20] of work engagement were attributable  
 455 to the frequency of positive events over time. Work engagement was higher for individuals who  
 456 experienced positive events more frequently over the period of four months.

457

**Table 4.** Growth Curve Modeling Analysis Predicting Trajectories of Work Engagement Over Time

Parameter	Growth Model 1			Growth Model 2		
	$\gamma$	SE	t	$\gamma$	SE	t
Level 2 (person-level)						
Intercept	2.48	0.06	38.36	2.47	0.06	38.63
Person-mean positive events	1.11	0.10	11.58 ***	0.98	0.12	8.36 ***
Person-mean negative events	-0.18	0.11	-1.70	-0.11	0.13	-0.91
Level 1 (week-level)						
Time	-0.01	0.01	-2.05 *	-0.01	0.01	-2.20 *
Cross-level interactions						
Person-mean positive events x time				0.03	0.01	1.97 *
Person-mean negative events x time				-0.02	0.02	-1.13
Variance components						
Level 2 intercept variance	0.34			0.33		
Time slope variance	0.00			0.00		
Level 1 intercept variance	0.39			0.39		
Deviance (df)	1857.86	***	(8)	1850.93	*	(10)
AIC	1873.86			1870.93		
BIC	1911.82			1918.37		

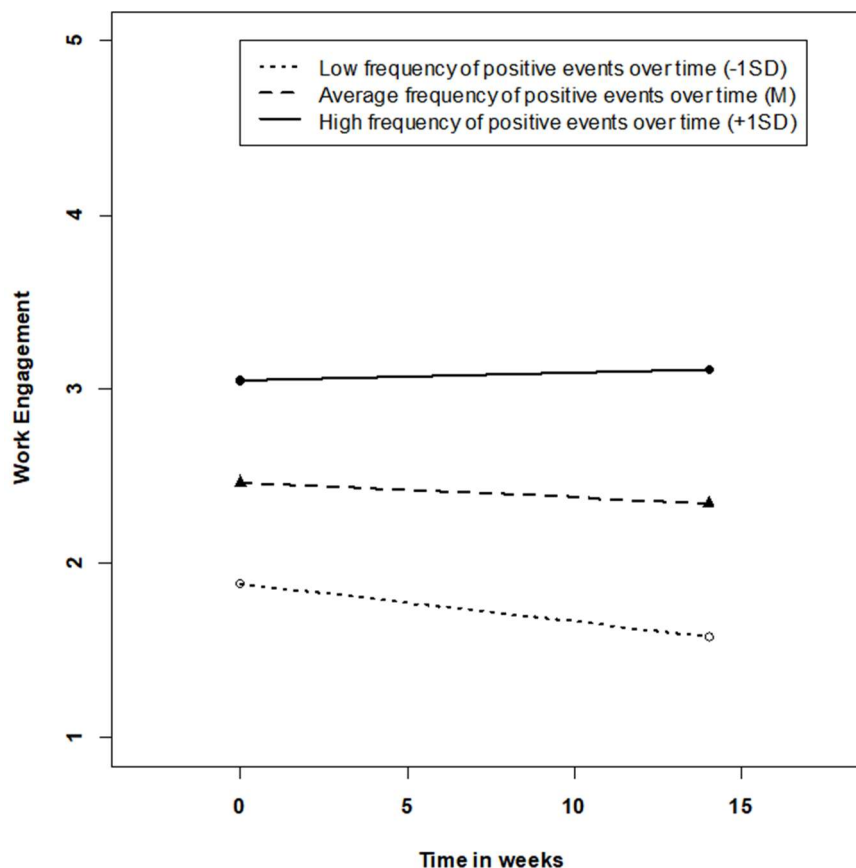
Note. SE = standard error. df = degrees of freedom. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ . Deviance = (-2 Residual Log Likelihood). AIC = Akaike information criterion. BIC = Bayesian information criterion

### 458 3.3. Additional Analyses

459 We ran a couple of additional analyses to scrutinize the robustness of our results, to address  
 460 potential alternative explanations, and to explore additional issues related to the link between work  
 461 events and work engagement. First, to rule out systematic bias due to missing data, we reran Models  
 462 1 through 4 using sub-samples of participants, who had provided either at least 8 ( $n = 51$ ) or 10 ( $n =$   
 463 39) out of 15 weekly reports. The pattern of results did not differ from our focal analyses. That is, all  
 464 main effects and interactions remained significant. These findings suggest that the number of  
 465 missing observations did not systematically affect the focal results and implies that the focal effects  
 466 are robust. Models using a sub-sample of participants who provided at least 12 reports per person  
 467 yielded convergence problems in Model 2 due to the low number of participants ( $n = 20$ ) and fall  
 468 below the threshold for minimum sample sizes at Level 2. Detailed results of the supplemental  
 469 analyses will be provided upon request to the first author.

470 Second, in our focal analyses, we have combined different types of positive events to a global  
 471 measure of positive events and we applied the same strategy to negative events. This approach helps  
 472 draw comparisons to prior research that has distinguished between positive vs. negative events in  
 473 general terms. However, in our study we applied an 11-item work-events checklist and also  
 474 included two items referring to off-job events, namely health-related problems and negative news in  
 475 employees' private lives. Hence, our study allows for a more fine-grained analysis of the relative  
 476 strength of association between work events and work engagement. Whereas prior research  
 477 basically tells us that positive events tend to be beneficial for work engagement, it would be  
 478 interesting to know, which types of events may be most relevant for work engagement at the  
 479 week-level and hence, which classes of events are actual drivers of work engagement. Following a  
 480 similar analytic strategy as in prior research on the comprehensive work events taxonomy [6], we

481 ran multilevel models and regressed work engagement at the week-level on all types of work events.  
 482 We applied the full sample for these analyses and specified random intercepts and fixed slopes for  
 483 each type of work event, because the sample sizes at both levels of analysis do not permit specifying  
 484 eleven random slopes within the same model. The results are displayed in Table 5. In essence, we  
 485 found almost all types of positive work events uniquely contribute to explain variance in week-level  
 486 work engagement. More specifically, goal attainment events ( $\gamma = .23$ ,  $t = 6.69$ ,  $p < .001$ ), passively  
 487 experienced positive events ( $\gamma = .16$ ,  $t = 5.59$ ,  $p < .001$ ), and episodes of praise, appreciation, and  
 488 positive feedback ( $\gamma = .20$ ,  $t = 6.45$ ,  $p < .001$ ) were positively related to levels of work engagement.  
 489 Furthermore, perceived competence through social interactions was significantly related to higher  
 490 levels of work engagement at the week-level, too ( $\gamma = .07$ ,  $t = 1.97$ ,  $p = .049$ ), albeit the coefficient was  
 491 a bit lower than for the other work events. By contrast, negative events were unrelated to week-level  
 492 work engagement, except for episodes of ambiguity, insecurity and loss of control. Interestingly, the  
 493 coefficient for this type of negative work event was positive rather than negative ( $\gamma = .07$ ,  $t = 2.11$ ,  $p =$   
 494  $.034$ ). Hence, this type of negative event contributes to enhance rather than diminish work  
 495 engagement, when considered in concert with all other types of work events. As the other negative  
 496 work events, negative off-job events did not yield significant associations with work engagement.



497  
 498 **Figure 3.** Trajectories of work engagement over 15 weeks dependent upon accumulation of positive  
 499 events over time.

500 Third, our study provides the opportunity to assess whether associations between positive  
 501 work events and work engagement within the same week are due to common method bias only.  
 502 More specifically, we leveraged the matched sample and ran an alternative version of Model 2  
 503 regressing work engagement in week  $n$  on positive and negative work events in week  $n$ , lagged  
 504 positive and negative work events in week  $n-1$  controlling for work engagement in week  $n-1$ . In



505 other words, we controlled for prior levels of the outcome variable when predicting week-level work  
 506 engagement. Finding significant associations between our focal predictors and work engagement  
 507 under these circumstances would facilitate interpretation of results as work events predicting  
 508 changes in work engagement rather than both phenomena co-occurring at the same time. The results  
 509 are presented in Table 6. In essence, we found the same pattern of results as in our focal analyses.  
 510 That is, the main effect of positive work events at Level 1 ( $\gamma = .72$ ,  $t = 12.19$ ,  $p < .001$ ) and the  
 511 interaction at Level 1 remained significant ( $\gamma = .37$ ,  $t = 2.43$ ,  $p = .015$ ). Not surprisingly, previous  
 512 week's work engagement was positively linked to current week's work engagement ( $\gamma = .27$ ,  $t = 6.29$ ,  
 513  $p < .001$ ). Of note however, the inclusion of work engagement from the previous week resulted in a  
 514 significant lagged effect of positive events in week n-1 on work engagement in week n ( $\gamma = -.19$ ,  $t =$   
 515  $-2.85$ ,  $p = .005$ ).

516 Finally, we probed whether positive and negative events interact *within the same week* to predict  
 517 work engagement. This perspective would be in line with the perspective of prior research on work  
 518 events, that has not accounted for the order of events (e.g., [19]). Moreover, this kind of concurrent  
 519 work events interaction corresponds to the perspective taken in experience-sampling research on job  
 520 demands and resources. We specified an alternative version of Model 2 including the interaction of  
 521 positive x negative events within the same week. In essence, when analyzing the full sample we  
 522 found evidence for the positive link between positive events and work engagement at the week-level  
 523 ( $\gamma = .69$ ,  $t = 13.35$ ,  $p < .001$ ) and that positive and negative events interact to predict work engagement  
 524 ( $\gamma = -.31$ ,  $t = -2.76$ ,  $p = .006$ ). Inspection of the simple slopes confirms that within the same week  
 525 negative events alleviate the link of positive events and work engagement. However, when  
 526 analyzing concurrent interactions across two consecutive weeks in the matched sample including all  
 527 combinations of positive events, negative events, and lagged positive events and lagged negative  
 528 events, we found no interactions of concurrent positive and negative events within the same week ( $\gamma$   
 529  $= -.13$ ,  $t = -0.83$ ,  $p = .41$ ). These supplemental analyses suggest that the pattern of interaction of  
 530 concurrent positive and negative events is opposite to the pattern of interaction when taking into  
 531 account the order of events. Negative events alleviate the link between positive events, when  
 532 measured concurrently with positive events. However, negative events amplify the link between  
 533 positive events and work engagement, when measured prior to positive events.  
 534

**Table 5.** Results from Multilevel Analysis Predicting Work Engagement by Specific Positive and Negative Events Within the Same Week

Parameter	Model 3			
	$\gamma$	SE	t	
Level 1 (week-level)				
Intercept	2.37	0.08	28.38	
Time	0.00	0.01	0.46	
Goal attainment, problem-solving, task-related success	0.23	0.03	6.70	***
Perceived competence in or through social interactions	0.07	0.03	1.97	*
Work-related good news	0.05	0.03	1.58	
Passively experienced positive events	0.16	0.03	5.59	***
Praise, appreciation, positive feedback	0.20	0.03	6.45	***
Technical difficulties, problems with work tools and equipment	0.00	0.03	0.17	

Health Complaints	-0.01	0.02	-0.30	
Private issues	-0.02	0.03	-0.51	
Hindrances in goal attainment, obstacles in completing work tasks, overload	-0.04	0.03	-1.52	
Problems in interactions with clients or patients	0.03	0.04	0.80	
Ambiguity, insecurity, loss of control	0.07	0.03	2.12	*
Conflicts and communication problems	-0.01	0.04	-0.25	
Managerial and internal problems, organizational climate	0.03	0.03	0.10	
<hr/>				
Variance components				
Level 2 intercept variance	0.77			
Time slope variance	0.00			
Level 1 intercept variance	0.27			
Deviance ( <i>df</i> )		1693.77		(19)
AIC		1731.77		
BIC		1821.91		

Note. *SE* = standard error. *df* = degrees of freedom. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Deviance = (-2 Residual Log Likelihood). AIC = Akaike information criterion. BIC = Bayesian information criterion

535

**Table 6.** Results from Multilevel Analysis Predicting Work Engagement in Week *n* Controlling for Work Engagement in Week *n-1*

Parameter	Model 4			
	$\gamma$	<i>SE</i>	<i>t</i>	
Level 2 (person-level)				
Intercept	1.78	0.12	14.75	
Person-mean positive events	0.90	0.11	8.16	***
Person-mean negative events	-0.09	0.10	-0.91	
Level 1 (week-level)				
Time	0.00	0.01	0.27	
Positive events (lagged week <i>n-1</i> )	-0.19	0.07	-2.85	*
Negative events (lagged week <i>n-1</i> )	-0.05	0.08	-0.60	
Positive events (week <i>n</i> )	0.73	0.06	12.19	***
Negative events (week <i>n</i> )	0.03	0.08	0.37	
Work Engagement (lagged week <i>n-1</i> )	0.27	0.04	6.29	***
Interactions				
Positive events x lagged positive events	-0.05	0.12	-0.45	
Negative events x lagged negative events	0.02	0.21	0.08	
Positive x lagged negative events	0.37	0.15	2.43	*
Negative events x lagged positive	0.08	0.18	0.46	

---

Variance components			
	Level 2 intercept variance	0.17	
	Positive events slope variance	0.01	
	Negative events slope variance	0.04	
	Lagged negative events slope variance	0.07	
	Level 1 intercept variance	0.27	
Deviance ( <i>df</i> )		889.48	(24)
AIC		937.48	
BIC		1038.14	

---

Note. *SE* = standard error. *df* = degrees of freedom. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Deviance = (-2 Residual Log Likelihood). AIC = Akaike information criterion. BIC = Bayesian information criterion

#### 536 4. Discussion

537 In this study, we have examined how positive and negative events dynamically interact to  
 538 predict fluctuations in work engagement from week to week. Notably, we have added a temporal  
 539 component [18], which might resolve inconsistent findings in prior research. Furthermore, our study  
 540 is among the first to explicitly consider whether the accumulation of work events is predictive of  
 541 mid-term trajectories of work engagement over a period of four months. Our approach complements  
 542 prior research on job demands and resources as more distal feature-oriented antecedents of work  
 543 engagement [11,65] and provides a more nuanced picture of the interplay of positive and negative  
 544 events over time.

545 First, our results extend prior research, which has reported that negative events may, under  
 546 certain circumstances, be beneficial for work engagement, dependent upon what happens  
 547 afterwards [18]. The present study contributes to clarify the dynamics underlying these seemingly  
 548 paradoxical effects [16]. Specifically, our results suggest that the occurrence of positive events is  
 549 tightly related to high levels of work engagement and that current positive events affect work  
 550 engagement particularly in the light of recent negative events. High levels of work engagement  
 551 result from a contrast that evolves when experiencing positive events in the aftermath of negative  
 552 events. The amplifying effect of recent negative events on the association between current positive  
 553 events and work engagement is consistent with research on the affective-shift model of work  
 554 engagement [18] and is also in line with the interplay of job demands and job resources as postulated  
 555 in job demands-resources theory [5]. However, taking into account the order of positive and  
 556 negative events provides a more differentiated picture. Whereas recent negative events interacted  
 557 with current positive events, recent positive events did not interact with current negative events to  
 558 predict work engagement. So, timing of positive and negative events may play a crucial role. In this  
 559 sense, our results illustrate the value of studying the experience of work through the lens of work  
 560 events and taking the order of events into account. Our results suggest that, for instance,  
 561 experiencing support after struggling with overload results in different levels of work engagement  
 562 than facing overload in the aftermath of support. In feature-oriented research on job demands and  
 563 resources researchers usually do not account for this distinction. Our results suggest that we need to  
 564 consider these temporal aspects to avoid inconsistent results in the future. Our supplemental  
 565 analyses show that while negative events alleviate the link between positive events and week-level  
 566 work engagement, negative events amplify the link between positive events and work engagement,  
 567 when negative events precede positive events. In this sense, our study may help explain why  
 568 interactions of demands and resources have emerged in some studies, but have not been found in  
 569 other studies applying feature oriented approaches to the interplay of job characteristics measured  
 570 concurrently. One reason for these inconsistencies may be that measures applied in feature-oriented

571 research neglect the temporal order of relevant events and result in mixed findings, depending on  
572 which timeframe employees have in mind when thinking about time pressure, organizational  
573 constraints, perceived progress towards goal attainment or praise from the supervisor.

574 Given that we did not find sensitization or satiation effects neither for positive nor for negative  
575 events, obviously, gains in work engagement do not result from a contrast between currently low  
576 frequencies of negative events vs. high frequencies of negative events in the previous week  
577 (adaptation). In the same way, positive events of the previous week do not alter the impact of this  
578 week's positive events on work engagement (intensification), but negative events of the previous  
579 week do. Importantly, whereas positive events yielded strong direct short-term associations with  
580 work engagement, negative events merely acted as the background for positive events, which  
581 amplifies the gains due to positive events – a pattern similar to the effects of positive events on  
582 fatigue in the face of high job demands [19]. Furthermore, our analysis of lagged effects from one  
583 week to the next suggests that work events apparently do not directly carry over from the previous  
584 week to the next week. Associations of positive and negative events with work engagement found in  
585 prior day-level research [14,18], therefore, seem to reflect short-lived effects, which fade out rather  
586 quickly within a couple of hours [3]. Admittedly, our measures of work events were focused on  
587 mundane rather than exceptional work events and therefore may underestimate how long the  
588 beneficial or detrimental effects may actually last. The impact of work events varies as a function of  
589 event strength and event duration [1,66]. For instance, the impact of novel or highly disruptive  
590 events like psychological contract breach [36] may not fade out after a couple of hours or days, but  
591 will likely take longer [1]. Our supplemental analyses on unique links of work events with work  
592 engagement within the same week suggest that almost all types of positive events quite consistently  
593 covary with work engagement.

594 Second, we rigorously tested whether work events yield sustained – and hence, practically  
595 meaningful, significant changes in employee engagement [20]. More specifically, our approach taps  
596 into accumulation effects over time. Given that knowledge about accumulation effects and the  
597 timing of both positive and negative events is scarce our results add to current theoretical  
598 perspectives [1,66]. We found that on average, work engagement tends to decrease and frequent  
599 exposure to positive events over time is associated with slower rates of change over time or  
600 constantly high levels of work engagement. For high frequencies of positive events a flat linear trend  
601 results – a pattern described as “passageway trajectory” in the literature (cf.[24]). The general  
602 downward trend is in line with the notion that work is associated with investment and thereby  
603 consumption of resources over time. Our results are in line with research, which has provided  
604 evidence for “some downward pressure on the general upward trend” [24]. This downward trend is  
605 also consistent with declining trajectories in variables related to work engagement. For instance, the  
606 organizational socialization [67,68] and voluntary turnover literature [69] literature suggests that  
607 there may be slow declining trajectories after being very enthusiastic as a newcomer, for instance  
608 due to the accumulation of minor events. Interestingly, our results imply that this downward trend  
609 may be compensated for by high frequencies of positive events. By contrast, in our study negative  
610 events did not accumulate to affect work engagement over time. This finding has important  
611 implications for understanding the role of positive events for building and sustaining high levels of  
612 engagement. Sustained high levels of work engagement over time are dependent upon being fed by  
613 frequent positive experiences. In the absence of continuous reinforcement [24], work engagement is  
614 likely to fade and decline quite substantially within the daily grind. In this sense, particularly  
615 positive events can be considered key drivers to maintaining and fostering engagement.

#### 616 4.1. Practical Implications

617 From a practical perspective, our findings suggest that the impact of single mundane work  
618 events across time may be quite limited. In other words, it is unlikely that single events undermine  
619 or boost the individual level of work engagement. This result is also in line with research on  
620 recovery from shock events [36]. However, the frequent occurrence of mundane positive events

621 accumulates to sustain the level of work engagement over periods of several weeks or months.  
622 According to our results, in the face of adversity, creating opportunities for positive events  
623 afterwards is superior to avoiding additional negative events to happen.

624 Supervisors might acknowledge their followers' progress towards goal accomplishment as an  
625 element of routine communication [e.g., 70] to foster positive events. Our suggestion coincides with  
626 facets of transactional leadership, such as contingent reward and proactive forms of management by  
627 exception [71] and stresses the importance of these leadership behaviors in daily job routine. In more  
628 general terms, organizations might develop structures and routines that facilitate positive events at  
629 work to happen. For instance, adequate job design [72] and optimal employee training are likely to  
630 contribute to experiencing successful task completion and positive feedback from others. Beyond  
631 goal attainment and successful mastery of job tasks, team meetings have a high potential to act as  
632 opportunities for positive social exchange that might constantly feed work engagement over time  
633 [see 6].

#### 634 *4.2. Strengths and Limitations*

635 The key strength of our study is that we applied an intensified longitudinal design over a  
636 period of four months and rigorous methods for analyzing data. We conducted a series of  
637 robustness checks and supplemental analyses qualify our core results. However, we had to rely on  
638 self-reports only, and our week-level design implied that retrospective reports referred to overall  
639 assessments of either the whole workweek, an approach that may come at the cost of retrospective  
640 bias [73]. On the other hand, we aimed to go beyond analysis of very short periods at the day-level,  
641 because we wanted to capture the impact of rare but potentially powerful events [cf. 28] and we  
642 intended to link transient processes to longer-term processes [20]. For instance, quits by colleagues  
643 or significant positive team events like informal gatherings for the celebration of a colleague's  
644 birthday usually do not occur within a few days, but may be important aspects of organizational life  
645 [1], likely to be overlooked in episodic or day-level studies. The relatively low prevalence of negative  
646 events displayed in Table 1 of less than one occurrence of each type of negative event per week on  
647 average suggests that the mid-term time frame of several weeks to months is in line with the  
648 relatively rare occurrence of work events which are strong enough to yield sustainable effects over  
649 time. Moreover, our supplemental analyses suggest that the associations between positive work  
650 events and work engagement within the same week are not purely a result of method-variance [74].  
651 Results hold when controlling for prior levels of work engagement. Although, researchers have  
652 recently suggested that affective events may be the result of affect(ive experiences), rather than the  
653 other way around [75], the idea of work events affecting affective states, such as work engagement is  
654 consistent with the basic tenets of affective events theory [12]. Our results are compatible with this  
655 more traditional view.

656 We have a high percentage of missing data. We obtained weekly reports for roughly half of the  
657 theoretically possible number of observations. This limitation is due to the high number of repeated  
658 observations within our ambitious design (fifteen diary surveys in total) which covered a period of  
659 almost four months. However, our random coefficient modeling approach does not hinge on  
660 listwise deletion and is apt to handle missing data. On average, each participant still provided more  
661 than six (and nearly five lagged) observations covering periods of at least two months. Furthermore,  
662 our supplemental analyses suggest that our results are not dependent upon the number of missing  
663 observations. Taken together, we believe that our results are valid despite the missing data.

664 Although, our study is among the first to study events based on the work events taxonomy by  
665 Ohly and Schmitt [6], we have not distinguished between different clusters of work events (e.g., goal  
666 attainment vs. praise or perceived competence) in our focal analyses. Consequently, rather than  
667 doing a fine-grained analysis of interactions among the five specific positive and six specific  
668 negative work-related event clusters identified, our study is meant to provide insights in general  
669 patterns of how positive and negative events (irrespective of their specific content) interact to predict  
670 work engagement (for a similar approach see [18]).

671 On a related note, several authors [1,66] have argued that the strength of events varies as a  
672 function of novelty, disruption, and criticality and should be considered to understand the impact of  
673 particular events with regard to individual level or organizational level outcomes. We did not  
674 monitor and incorporate these kinds of event characteristics in this study as our focus was on the  
675 dynamic interplay of the quantity of work events over time. However, we consider our study a first  
676 step towards a better understanding of the dynamics of work events per se, which provides the basis  
677 for further scrutiny in the next step.

#### 678 4.3. Implications for Future Research

679 Although, our study has addressed several gaps in the literature, a couple of unresolved issues  
680 remain to be considered in future research. While some researchers have found negative events to  
681 predict lower levels of work engagement [14,see also Table 3 in 18], we did not find direct and  
682 lagged effects of negative events on average. These inconsistencies may be due to differences in the  
683 way work events were measured (open answer format vs. event checklist) or due to different time  
684 lags applied (day-level vs. week-level) [3]. For instance, Bone and colleagues [23] provided evidence  
685 that the impact of work events on employee health may differ quite substantially dependent upon  
686 whether data are analyzed at the episodic or at the day-level. Accordingly, it may not be  
687 straightforward to generalize results from day-level research to longer time frames [76]. From our  
688 study, it is not quite clear whether negative events did not affect work engagement at all or whether  
689 the effects have faded out before assessing work engagement at the end of the workweek [3].  
690 Day-level data over a period of several weeks would allow gaining a clearer picture of how long it  
691 takes until the effects of work events unfold or fade out [77]. Combining day-level and week-level  
692 perspectives would further contribute to close the gap between transient processes and longer-term  
693 processes discussed above [20]. As noted above, tracking indicators of event strength alongside the  
694 frequency of events may contribute to further reconcile contradictory findings and to integrate  
695 research on work events within event system theory [1].

696 On a related note, by definition work events are discrete and are meant to change the  
697 experience of work quite fundamentally and sustainably. Significant work events may even be  
698 triggers of transition processes, rather than predictors of minor short-term fluctuation in work  
699 engagement [12]. In this sense, future experience sampling research might apply discontinuous  
700 growth modeling approaches to account for the discrete nature of (rare, but potentially powerful  
701 affective) events [69] and study shifts in work engagement in addition to day-level fluctuation [78].  
702 Further advancing discontinuous perspectives, drawing on recent research by Koopmann, Lanaj,  
703 Bono, and Campana (2016), who found regulatory focus to mediate short-term effects of positive and  
704 negative events on employee strain, and at the backdrop of our results, future research might also  
705 explore the role of shifts in regulatory focus for fluctuation in work engagement.

706 Although we have illustrated the dynamic interplay of positive and negative events using  
707 examples of events, which may refer to the same task (e.g., struggling with obstacles in a certain task  
708 in one week and successfully finishing the task in the consecutive week), we did not track whether  
709 the positive events in one week actually were related to the negative events in the preceding  
710 workweek. Future research might scrutinize whether compensatory effects are dependent upon a  
711 link between the positive and lagged negative events. Furthermore, personality traits such as  
712 positive affectivity might influence the relationships between positive and events, their interplay,  
713 and work engagement (Bledow et al., 2011) which needs to be taken into account in future studies.

#### 714 5. Conclusion

715 Our study adds a temporal component to the research of work events and work engagement.  
716 More specifically, we provide evidence that recent negative events amplify the beneficial effects of  
717 current positive events on work engagement. Hence, studying the experience of work through the  
718 lens of work events over time [1] provides a better understanding of the contingencies and the

719 dynamic interplay that determine work engagement. Furthermore, this study links transient  
720 processes to longer-term processes underlying engagement and shows that positive events  
721 accumulate to feed continuously high levels of work engagement over periods of several months.  
722 Overall our study provides insights into how work events combine to affect work engagement over  
723 time. Notably, our results on mid-term changes in work engagement underscore the practical  
724 relevance of work events for employee well-being. We hope our study contributes to provide  
725 insights into the vital worker and will inspire further research on what happens at work through the  
726 lens of work events in the future.

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728 and S.O. provided the work events checklist. O.W. set up the electronic surveys, was in charge of  
729 communication with participants, collected the data, and was in charge of data preparation for analysis and all  
730 analyses. O.W. wrote the original draft. C.S., A.S. and S.O. commented on earlier versions of the manuscript.  
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