The Relationship between Momentary Capitalizing and Momentary Positive Affect: An Experience Sampling Study

Paula V. Oberle

1st supervisor: Charlotte van Lotringen

2nd supervisor: Dr. Annemarie Braakman-Jansen

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Faculty of Behavioural, Management, and Social Sciences

University of Twente

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Abstract

Background: Capitalizing is an emotion regulation strategy that aims at increasing positive emotions by seeking out others to tell them about personal positive events. Despite the growing body of research on emotion regulation strategies and wellbeing, findings on the association between capitalizing and positive affect (PA) have been indecisive. Previous research furthermore often relied on self-report measurements that demanded retrospective recall which disregards fluctuations during the day and is prone to biased answers.

Objective: This current study aimed at clarifying the relationship between capitalizing and positive affect and explicitly focused on momentary measures to consider fluctuations during the day and rule out retrospective recall bias. We first investigated the relationship between momentary capitalizing and momentary PA and secondly examined to what extent momentary capitalizing moderates the relationship between positive events and momentary PA.

Methods: For the momentary measures, experience sampling methodology (ESM) was used for a study duration of two weeks. During this period, all participants (N=60) received four questionnaires at different times throughout the day. They were questioned about events that happened since the last questionnaire, to what extent they have capitalized, and their current levels of positive affect. In addition, they completed one baseline questionnaire for demographics and trait measures. The data were examined using linear mixed models.

Results: Momentary capitalizing was strongly positively related to momentary PA *(p<.001)*. Surprisingly, momentary capitalizing diminished the relationship between positive events and momentary PA *(p<.001)*.

Conclusion: This study builds on earlier research by providing evidence for the relationship between momentary capitalizing and momentary PA. It supports the assumption that only momentary and not trait measures of the concepts are related. The unexpected negative moderation effect might be explained by the fact that the event participants reported as a recent positive event and the event they capitalized on did not have to be the same one. Hence, capitalizing on another event might have distracted participants from the recent one and therefore diminished the positive affect related to the recent event. Moreover, we did not consider different reactions to and different forms of capitalizing (e.g. online or in person). Thus, we were not able to consider how these aspects modified the relationship. This study contributes to society and clinical practice by drawing attention to the benefits of capitalizing and expands the research field by suggesting not only to consider the advantages but also the shortcoming of emotion regulation strategies.

The Relationship between Momentary Capitalizing and Momentary Positive Affect: An Experience Sampling Study

When people feel joy, awe, or excitement they often do not just run with their emotions as they come. Instead, most people master a variety of strategies that help them maintain, increase, and regulate their positive emotions. Capitalizing is one of those emotion regulation strategies which involves seeking out others to tell them about personal positive events (Langston, 1994). In recent years, there has been an increasing amount of literature on how capitalizing is related to daily positive affect (Gable et. al 2004; Lambert et al., 2013 Langston, 1994; Quoidbach et al., 2010). The results, however, as will be discussed, have not been consistent, and the studies have used self-report designs that demanded recall and reflection either at one moment in time (Quoidbach et al., 2010), three times a week (Lambert et al., 2013) or daily in the evening over the course of one week (Gable et. al 2004; Langston 1994). However, this kind of research design misses the dynamic aspect of positive affect and moreover promotes a retrospective recall bias (Myin-Germeys et al., 2018). The current study aims to remedy these limitations by applying an experience sampling design to examine the extent to which capitalizing is associated with positive affect and what role capitalizing plays in the relationship between positive events and positive affect.

Capitalizing is a savouring strategy, which means that it is used to maintain and increase positive emotions (Quoidbach et al., 2010). When capitalizing, individuals seek out and communicate with others to share their positive events (Langston, 1994). Some research has focused on the relationship between capitalizing and wellbeing. Daily diary studies by Lambert et al. (2013), Langston (1994) as well as Gable et al. (2004) suggest that the use of the capitalizing strategy is associated with higher positive affect. These results may be explained by the fact that talking to others about a positive event prolongs its positive experience and helps to remember it better (Tugade & Fredrickson, 2007). Furthermore, capitalizing creates valuable social interactions which are accompanied by positive emotions. These positive emotions, according to the upward spiral theory of Fredrickson and Joiner (2002), generate future positive emotions and lead to positive affect. Another mechanism that might lead to these results is the expression of emotion (Gable et. al., 2004). As earlier studies (e.g., Harker & Keltner, 2001) showed a relationship between the expression of emotion and increased wellbeing, it is possible that the mere expression of emotion explains the association between capitalizing and positive affect.

Before further concentrating on the relationship between capitalizing and positive affect it is reasonable to take a closer look at the concept positive affect (PA) itself. Next to life

satisfaction (i.e. cognitive wellbeing), positive affect or emotional wellbeing is one of the components of wellbeing (Quoidbach et al., 2010). Watson et al. (1988) further described it as the "extent to which a person feels enthusiastic, active, and alert" with high PA being a "state of high energy, full concentration, and pleasurable engagement". Large amounts of literature stress the positive consequences of positive affect and therefore illustrate it as a desirable state (e.g. Lyubomirsky et al., 2005; Pressman & Cohen, 2005: Watson et al., 1988). As an example, positive affect has been found to correlate with superior mental and physical health, more positive self-perceptions, and a more supportive social network while the absence of positive affect has been found to be related to immune deficiency (Lyubomirsky et al., 2005). Lyubomirsky et al. (2005) in fact define happiness as the amount of time one is experiencing positive affect.

However, the evidence for the relationship between capitalizing and positive affect is discordant. Quoidbach et al. (2010) conducted a study of which the results contrasted those of the beforementioned studies by Lambert et al. (2013), Langston (1994) and Gable et al. (2004). In the study by Quoidbach et al. (2010), 282 participants were tested on positive affect and on their typical use of savouring and dampening strategies. Dampening strategies, as opposed to savouring strategies, are strategies used to dampen positive experiences and emotions (Quoidbach et al., 2010). For this study, participants were given descriptions of situations that elicit certain emotions and were asked to choose from a list how they would typically feel and react. The results showed no association between capitalizing and positive affect. However, a strong limitation of the study was that it relied on self-report measurements at one specific moment in time. The participants had to reflect on their typical behaviour, although several studies have revealed that retrospective recall of affect often does not coincide with the actual experience (Ben-Zeev et al., 2009; Kardum & Daskijevic, 2001, as in Ben-Zeev et al., 2009; Thomas & Diener, 1990, as in Ben-Zeev et al., 2009). In conclusion, Quoidbach et al., (2010) measured trait affect through estimates of participants on how they would react in fictive scenarios instead of momentary affect as truly experienced.

In contrast to the study by Quoidbach et al. (2010), the previously mentioned studies by Lambert et. al. (2013), Langston (1994) and Gable et al. (2004) used daily diary reports. In these daily diary reports, participants were asked to describe the most positive event of the day in the evening and indicate how they have reacted to it and if they have capitalized it. Thus, the results might reflect the participants' actual behaviour slightly better. However, the study designs still demanded recall in the evening and entailed that only acts of capitalizing of the most impactful events of the day were considered while capitalizing of small positive issues

was neglected. Furthermore, PA was measured only in the evening in Gable et al.'s study (2004) and three times a week in Lambert et al.'s study (2013), while current mood was queried five times during the day in Langston's study (1994). This means that at least Gable et al. (2004) and Lambert et al. (2013) did not consider fluctuations during the day, although emotions have been identified to be dynamic throughout the day and closely related to changes in the environment (Houben et al., 2015; Larsen, 2000). PA more specifically has been found to vary strongly throughout the day (Watson et al., 1988). Altogether these flaws in the study designs of earlier takes on the relationship between positive events, capitalizing, and positive affect point toward a need for further research that considers fluctuations in positive affect throughout the day, smaller positive events, and capitalizing of any kind, and moreover avoids recall bias.

A more promising research method to test the association between capitalizing and PA is the self-report diary technique experience sampling methodology (ESM) (Myin-Germeys & Kuppens, 2021). In ESM, participants receive several alerts, for example on their smartphone, throughout the day for a period of about one to two weeks. Whenever a participant gets a notification, they are requested to fill out a short questionnaire. In the current study, they will be questioned about events that happened since the last questionnaire, to what extent they have capitalized, and their current levels of positive affect. This way, the dynamic aspect of the psychological processes and their fluctuations during the day are considered and the behaviour and levels of positive affect can be understood in relation to the context (Myin-Germeys & Kuppens, 2021). Further, the required level of reflection and recall is minimized. Another advantage is that not only one, but several positive events per day and their consequences are observed and that all acts of capitalizing are considered.

The purpose of the current study is to clarify the relationship between capitalizing and PA. The first research question seeks to find out to what extent momentary capitalizing is related to momentary PA. As previous studies found a positive relationship if they focused on momentary instead of trait measures, it is hypothesized that the current study will reveal a positive relationship between momentary capitalizing and momentary positive affect as well. The second research question asks to what extent momentary capitalizing moderates the relationship between positive events and momentary positive affect. Despite previous research on related questions, there seems to be a lack of research focusing specifically on this moderating relationship. Positive events tend to generate positive emotions (Gable & Reis, 2010; Jose et al., 2012) and momentary capitalizing has been found to be positively related with momentary PA even when controlled for positive events (Gable et al., 2004). Further, the

application of savouring strategies in general has been identified as a moderator of the relationship between positive events and emotional reactions (Jose et al., 2012). Therefore, we hypothesized that momentary capitalizing would have an enhancing effect on the relationship between positive events and momentary PA.

Besides filling gaps in the research field, the current study could contribute to the mental wellbeing of society. Since, as elaborated on above, positive affect has been identified as a desirable state with positive consequences for mental and physical health a general interest in how to achieve this state is warranted. This study could clarify and confirm the assumption that capitalizing is a way to increase positive affect and therefore reveal it as an effective tool for individuals to consciously achieve positive affect and its desirable consequences. This also has implications for therapy, as positive affect has been shown to improve mental health. Thus, if capitalizing will indeed be identified as a predictor of positive affect, it could be considered by practitioners to cover it in social skills training or to give clients capitalizing exercises as homework.

RQ1: To what extent is momentary capitalizing related to momentary positive affect?

RQ2: To what extent does momentary capitalizing moderate the relationship between positive events and momentary positive affect?

Methods

Design

The study followed a longitudinal correlational research design. In addition to a baseline questionnaire which was used to measure demographics and trait measures, an experience sampling methodology (ESM) approach was used. Within this approach, four questionnaires per day were sent out at different times for a study duration of two weeks in order to investigate momentary measures of the relevant concepts.

Procedure

The study was set up on the experience sampling platform Ethica (Ethica Data Services Inc., 2022) and pilot-tested by the research team. After the study received ethical approval from the ethics committee of behavioural, management, and social sciences of the University of Twente, the participants were contacted by email and asked to download the app Ethica to give their informed consent (see Appendix A). All participants started the 14-day-long ESM-period on the same day, April 13th, 2022. The duration of 14 days is in line with the median duration

of ESM studies of 14 days (van Berkel et al., 2017). On the second day of the ESM-period, participants were prompted to fill out the baseline questionnaire. If they did not fill it out immediately, they were reminded after 8, 24, and 72 hours. The baseline questionnaire did not expire throughout the duration of the study and could therefore be completed until the fourteenth day. The ESM questionnaire followed a semi-random sampling scheme and was triggered four times a day for a duration of two weeks. Participants received the notifications randomly between 10:00 & 11:00, 13:30 &14:30, 17:00 & 18:00 and 20:30 & 21:30 o'clock. One hour after the notification they were reminded to fill out the questionnaire. If they did not fill it out within two hours after the notification, the questionnaire expired.

Participants

Participants were recruited through the online platform SONA. Furthermore, relatives and acquaintances of our social environment were asked to participate in the study. As experience sampling methodology studies bring along a comparatively high burden for participants (van Berkel et al., 2017), convenience sampling seemed like an appropriate strategy. In order to prevent a low response rate and careless responding, participants need sufficient motivation (van Berkel et al., 2017; Eisele, et al., 2022). Therefore, through convenience sampling, we hoped to be able to personally convince participants of the importance of the study and motivate them to conscientious participation. Students who took part via the platform SONA received 3.5 course credits for participation. Participants who were recruited another way received no compensation. Inclusion criteria for participation were the possession of a smartphone with iOS or Android, sufficient English skills, and a minimum age of 18 years.

The initial sample consisted of 96 participants of whom 36 individuals were excluded from the study due to a response rate below 50%. The final sample size was 60 which is in line with the mean sample size of 53 for experience sampling studies (van Berkel et al., 2017). We oriented ourselves towards previous studies as power analyses are not yet widespread practice in ESM research.

Materials

Baseline questionnaire

General. The initial questionnaire that participants were asked to fill out at the beginning of the study was a 71-item long traditional self-report questionnaire that covered demographics, general mental wellbeing (including trait mental health and trait emotional wellbeing), and trait capitalizing (see appendix B). As this study was part of a larger research project, it further included items about other constructs that are not relevant to this study.

Besides opting for the most fitting measures content-wise, all measures were chosen with regard to earlier reliability measures and the widespread practice of using Cronbach's alpha as a measure of scale reliability (Taber, 2018; Teo, 2013). Hereby we adopted the rule of thumb of considering reliability values higher than .8 as good and higher than .9 as excellent. (George & Mallery, 2020).

Trait mental health & trait emotional wellbeing. Trait mental health was assessed through the Mental Health Continuum – Short form (MHC-SF) (Lamers et al., 2011). It comprises the subscales emotional wellbeing, psychological wellbeing, and social wellbeing (Lamers et al., 2011). The participants were given 14 statements about feelings and thoughts and were asked to indicate how often during the past month they have felt this way. Answers were given on a 6-point scale (never, once or twice, about once a week, about 2 or 3 times a week, almost every day, every day). Previous evaluations of its psychometric properties showed that the MHC-SH is a highly reliable (α = .89) and valid instrument (Lamers et al., 2011). Also in the current study, the instrument proved to have excellent reliability (α = .92). Examples for items are "Please indicate how often you felt happy during the past month", "Please indicate how often you felt satisfied with life during the past month", and "How often did you feel that your life has a sense of direction or meaning to it during the past month?". In addition, the subscale emotional wellbeing, which deals with the affective component of wellbeing (Lamers et al., 2011), was considered separately in order to compare it with the momentary measures of positive affect. Lamers et al. (2011) also found this subscale to be highly reliable (α = .83). In the current study, a Cronbach's alpha of .88 indicated good reliability as well. It was used to measure trait emotional wellbeing.

Trait capitalizing. To assess trait capitalizing, a 4-item scale by Lambert et al. (2013) for measuring the extent to which participants shared positive experiences with others was used. Participants had to indicate on a 7-point Likert-scale (strongly disagree, mostly disagree, somewhat disagree, neither agree or disagree, somewhat agree, mostly agree, strongly agree) to what extent they agree with the following statements: "I am the type of person who loves to share it with others when something good happens to me", "I almost always let the people that I am close to know when I feel good and why", "I usually keep good feelings bottled up and don't share them very often", "I am constantly telling people my good news". The scale was chosen as Lambert et al. (2013) found this scale to be highly reliable (α = .89). In the current study, the scale proved to have good reliability (α = .84) as well.

Experience sampling methodology (ESM) questionnaire

Positive events. The ESM questionnaire consisted of 21 items (see appendix C). To measure positive events, participants were asked to answer the following item on a 7-point Likert scale (from -3 = very unpleasant to 3 = very pleasant): "Think of the most striking event or activity of the last hour. How (un)pleasant was this event or activity?". Since for analysis and interpretation, it was solely relevant if the most striking event since the last questionnaire has been considered positive or not, this variable was dichotomized after the data collection. All answers higher than zero were regarded as positive events while all answers below or equal to zero were regarded as no positive event.

Momentary capitalizing. To measure momentary capitalizing, participants were asked how much they let others know about positive things they experienced in the last hour (from 1 = not at all to 7 = very much). The exact wording of the item was "In the last hour, I let other people know about positive things I experienced (these can also be small positive things)".

Momentary positive affect. Momentary positive affect was measured through four items that ask how participants felt right before they received the notification of the questionnaire. The four items "How cheerful do you feel right now?", "How enthusiastic do you feel right now?", "How satisfied do you feel right now?", and "How relaxed do you feel right now?" were measured on a 7-point Likert scale (from 1 = not at all to 7 = very much). These items were taken from the ESM repository, which is an open repository of validated ESM items that all researchers who work on ESM studies can contribute to (Kirtley et al., 2020). The four items were part of an originally 6-item long scale on positive affect created by Maes et al. (2015) and have in combination been used before in ESM studies to measure positive affect (Kirtley et al., 2020). The reason for including only four of the six items was to keep the questionnaire as short as possible, as longer ESM questionnaires were shown to be associated with a higher perceived burden for the participant, a lower compliance rate, and a higher chance of careless responding (Eisele et al., 2022).

Participant. Each participant who was part of the final sample received a participant ID that enabled us to organize and examine all filled-out ESM questionnaires per person. This subject-identifying variable was saved under the name participant.

Time. The variable time was created automatically to differentiate between the different time points of the ESM questionnaires. It assigns a different value to each questionnaire sent out. Values on this variable ranged from 1 to 56, as answers given to the first questionnaire sent out receive the value 1, answers given to the second questionnaire sent out receive the value 2, and so forth.

Analysis

Data preparation

After the data was prepared in R-studio, all analyses were conducted in IBM SPSS statistics 28. Participants who filled out less than 50% of all ESM questionnaires were removed as they might have only filled them out at times when it was convenient for them which might lead to biased sets of answers (van Berkel et al., 2017; Viechtbauer, 2021a). Missing data that did not fall under the threshold of 50% per participant was neglected and did not lead to an exclusion. Although there are so far no well-supported recommendations for cut-off scores (van Berkel et al., 2017), this is in line with common ESM practice (Conner & Lehman, 2012, as in Kraiss et al., 2022). Furthermore, new variables for total momentary positive affect, trait mental health, and trait emotional wellbeing were computed by calculating the means of the corresponding items. Next, the variable measuring positive events was dichotomized in order to simply differentiate between positive and negative events. For this, all events that were rated higher than zero were considered positive events while all answers that were equal to or below zero were not considered positive. For all relevant variables, Z-scores were calculated to obtain standardized correlation coefficients in addition to the non-standardized estimates to simplify the interpretation.

Descriptive statistics and psychometric properties

To determine the characteristics of the sample, we calculated the mean age and the range of age, proportions of genders, nationalities, occupations, and highest education of all participants. Furthermore, the average compliance rate was calculated by dividing the mean of completed questionnaires per person by the total number of ESM questionnaires per person and multiplying the result by 100. Next, we determined the proportion of positive events among all events and mean scores for trait mental health, trait emotional wellbeing, and trait capitalizing, as well as for momentary positive affect and momentary capitalizing for each week.

To assess the convergent validity of the ESM measures Pearson correlations between trait capitalizing and momentary capitalizing were calculated. Calculating Pearson correlations between two scales is common practice and recommended to determine convergent validity in quantitative research (Carlson & Herdman, 2012; Paranhos et al., 2014, as in Ahrens et al., 2020). We expected positive correlations as these would indicate that trait and momentary measures measure the same latent construct. Since the subscale emotional wellbeing of the MHC-SF measures positive feelings (i.e., positive affect) on trait level (Lamers et al., 2011), the correlation between the aforesaid subscale and momentary positive affect was determined as well. To classify the strengths of the correlations we applied the guidelines by Carlson &

Herdman (2012) for interpreting convergent validity, according to which correlations higher than .70 are considered good and higher than .50 acceptable.

To determine the reliability of the baseline questionnaire, we conducted separate reliability measures for the MHC-SF, the MHC-SF emotional wellbeing scale, and the trait capitalizing scale. For the interpretation of the results we used the guidelines by George & Mallery (2020), according to which Cronbach's alpha values higher than .8 are considered good, and values higher than .9 are considered excellent.

To determine the internal consistency of the ESM questionnaire throughout the duration of the study, split-half reliability was calculated. For this, new person-mean variables were created for momentary capitalizing and momentary positive affect. These person-mean variables were computed by calculating the mean of the total scores on both scales per participant across all observations. Thus, the person-mean variables describe how high a participant scored on average on momentary capitalizing and momentary positive affect. Split-half reliability was then determined by correlating the person-means of the first week with the person-means of the second week for both variables. For these and all following correlation measures, we used Gignac & Szodorai's (2016) effect size guidelines for Pearson correlations, which recommend considering correlations of .10 as relatively small, .20 as typical, and .30 as relatively large.

Inferential statistics

Due to its longitudinal design across a sample, experience sampling data are characterized by repeated measures within and across individuals. As fixed effect models are not equipped to consider multiple measures per individual, two linear mixed models were used for the main analyses. Linear mixed models (LMM) are a type of mixed-effects models that are frequently used for ESM data since they can estimate correlations while accounting for data with repeated measurements that are nested within different individuals as is the case with ESM data (Viechtbauer, 2021b). It further takes random errors and missing data into account (Magezi, 2015). To answer the first research question about the association between momentary capitalizing and momentary positive affect, a LMM with momentary capitalizing as the predictor variable and momentary positive affect as the dependent variable was used. To consider the grouped data due to repeated measures per person and to account for person-level differences, the variable participant was included in the model as a random effect. Lastly, the continuous variable time was included in the repeated box in order to indicate that repeated measures were taken within individuals.

For the second research question which dealt with the extent to which capitalizing moderated the relationship between positive events and momentary positive affect, another LMM was used. Momentary positive affect again served as the dependent variable and this time both positive events and momentary capitalizing served as predictors. As in the first LMM, participant was added as a random effect and time was included to consider repeated measurements. Additionally, the interaction effect between both predictors was calculated in order to assess to what extent capitalizing enhances the relationship between positive events and momentary positive affect. All LMM analyses were conducted with non-standardized as well as standardized variables.

<div align="center">**Results**</div>

Introduction of the data

Of the 96 participants who filled out the baseline questionnaire 37.5% (n=36) were excluded as their response rate to the ESM questionnaires was lower than 50%. The remaining participants (N=60) were between 18 and 65 with a mean age of 23.4 (SD=8.0). Further sociodemographic characteristics of the final sample can be seen in Table 1. Of the 3360 questionnaires that were sent out in total to the final sample at 56 time points, 2573 questionnaires were completed. The average response rate per included participant was 72.9%.

Table 1

Sociodemographic characteristics of the sample (N=60)

		n	$\%$
Gender	Female	35	58.3
	Male	25	41.7
	Other	0	0.0
Nationality	Dutch	11	18.3
	German	41	68.3
	Other	8	13.3
Highest education	High school	52	86.7
	Bachelor	4	6.7
	Master	3	5.0
	Other	1	1.7
Occupation	Working	5	8.3
	Student	34	56.7

Studying and working	18	30.0
Not working	2	3.3
Other	1	1.7

Descriptive statistics and psychometric properties

In 80% of all cases, participants reported that the most striking event since the last questionnaire has been positive (1919 events) while 20% of all most striking events were neutral or negative (481 events). The mean (*SD*=0.9) for trait mental health was 2.6, which is more than one standard deviation lower than the mean score of 3.98 (*SD*=0.9) that has been reported for a Dutch population before (Lamers et al., 2011). The mean of 3.2 (*SD*=0.9) for trait emotional wellbeing in this study was also distinctly lower than the mean of 4.7 (*SD*=0.9) that Lamers et al. (2011) have determined before. Thus, the mental health and emotional wellbeing of our sample were below the norm score for a Dutch population. For the trait capitalizing scores (*M*= 3.5, *SD*=1.2) there are no reference values, as Lambert et al. (2013) who created the scale, have not reported any descriptive statistics.

Pearson correlations between the person-means of momentary and trait variables, that were calculated in order to test for convergent validity, were in the expected directions. As Table 2 shows, there was a significant positive correlation between trait capitalizing and momentary capitalizing, $r(58) = .52, p < .001$, 95% CI [0.31, 0.69]. Momentary positive affect (PA) correlated positively with trait emotional wellbeing, $r(58) = .50$, p < .001 95% CI [0.29, 0.67]. As both estimates are higher or equal to .5 and significant at the .001 level both measurements of momentary PA, as well as momentary capitalizing, are considered acceptable (Carlson & Herdman, 2012) and provide supportive evidence for the instrument.

Split-half reliability measures showed that momentary capitalizing in the first week (*M=3.25, SD*=1.0) was positively related to momentary capitalizing in the second week (*M*=3.4, *SD*=1.2), $r(58) = .69, p < .001$. Momentary PA in the first week (*M*=4.1, *SD*=0.8) also correlated positively with momentary PA in the second week *(M*=4.2, *SD*=0.9), $r(58) = .80$, p > .001. As these correlations are relatively large (Gignac & Szodorai, 2016), both the momentary capitalizing and the momentary PA items are consistent and measured the concept reliably throughout the two weeks.

Table 2

Means, standard deviations, and Pearson correlations of trait and momentary measures

	M	*SD*	1	2	3	4	5
1. Trait mental health	2.6	0.9	1				
2. Trait emo. wellbeing	3.2	0.9	.84***	1			
3. Trait capitalizing	3.5	1.2	.27*	.30*	1		
4. Mom. PA	4.1	1.3	**.47***	**.50***	.25	1	
5. Mom. capitalizing	3.3	1.9	.37**	.32*	**.52***	.61***	1

Note. $N = 60$. Non-standardized values on a 7-point Likert scale.

Note. Trait emo. wellbeing trait emotional wellbeing *Mom. PA* momentary positive affect, *Mom. capitalizing* momentary capitalizing.

* p < .05, ** p < 0.01, *** p< 0.001.

Inferential statistics

Consistent with the first hypothesis, increased use of capitalizing was associated with significantly higher positive affect with 0.27 points, $t(2348.46)=22.18$, p<.001, 95% CI [0.25, 0.30]. Considering the standardized estimate of .38, $t(2348,46)=22.18$, p<.001, 95% CI [0.34, 0.42], and the guidelines by Gignac & Szodorai's (2016), the positive relationship between momentary capitalizing and momentary PA can be considered relatively large. Even when controlling for positive events, as done with the second linear model conducted, the relationship between capitalizing and positive affect remained significant (Table 3).

Regarding the second research question, the linear mixed model with an included interaction effect of momentary capitalizing and momentary PA showed surprising results. As expected, there was a strong significant positive relationship between positive events and momentary PA. However, different than expected, momentary capitalizing did not enhance but diminish this positive relationship. The interaction effect in the negative direction was relatively small (Gignac & Szodorai, 2016), but significant.

Table 3

Linear Mixed Models for the second research question with positive affect as the dependent variable, momentary capitalizing and positive events as predictors, random effect for participant, and an interaction effect between positive events and capitalizing

	Estimate	SE	df	t	p	95% CI LB	UB
			Non-standardized				
Capitalizing	0.25	.02	2269.95	13.67	<.001	0.21	0.28
Pos. events	0.88	.08	2034.72	10.82	<.001	0.72	1.03
Interaction	-.06	.02	2053.10	-2.62	.009	-0.10	0.01
			Standardized				
Capitalizing	.47	.03	2072.69	17.102	<.001	-0.42	-0.52
Pos. events	.60	.04	2303.22	16.98	<.001	0.53	0.67
Interaction	-.16	.04	2280.84	-4.34	<.001	-0.23	0.09

Note. CI confidence interval, *df* Degrees of freedom, *LB* Lower bound, *UB* Upper bound, *SE* Standard error, *Pos. events* Positive events.

Discussion

The purpose of this current research was to clarify the relationship between capitalizing and positive affect (PA) and explicitly focus on momentary measures to consider fluctuations during the day and rule out retrospective recall bias. The results show that momentary capitalizing is positively related to momentary PA. Another key finding was that capitalizing does not enhance the positive relationship between positive events and momentary PA, but instead slightly diminishes it.

These results are partly consistent with previous research. The found association between momentary capitalizing and momentary PA is in line with the results of studies by Langston (1994), Gable et al. (2004), and Lambert et al. (2013). However, it contrasts with a study by Quoidbach et al. (2010), who did not find a significant relationship between capitalizing and PA. This may be explained by the differing focus on trait versus momentary measures. While Langston (1994), Gable et al. (2004), and Lambert et al. (2013) conducted daily diary studies, Quoidbach et al. (2010) did not collect longitudinal data and questioned participants at solely one point in time on their typical use of capitalizing and their current levels of PA. An interpretation of these discrepancies in findings is that only momentary or

state measures of capitalizing and PA are related to each other, while trait measures are not. Steyer et al. (1999) argue that although a latent trait is always a component of a latent state, behaviours eventually depend more on the situation than on the traits of an individual. This could mean that in the relationship between capitalizing and PA, situational factors play a more important role than an individual's mental health or typical use of capitalizing. Other possibilities are that the results in Quoidbach et al.'s (2010) study were imprecise due to the demand for recall and retrospection by participants, or that capitalizing does have short-term effects on PA, but no long-term effects on mental health.

Regarding the second research question, it was hypothesised that momentary capitalizing enhances the relationship between positive events and momentary positive affect. Our results however suggest that, although both momentary capitalizing and recent positive events have a positive impact on momentary PA independently of each other, when participants capitalized, the impact of a positive event on PA diminished. These findings are not in line with previous research which identified momentary savouring as a moderator of the impact of daily positive events on momentary happy mood (Jose et al., 2012). In their study, however, savouring was not limited to capitalizing but comprised several different emotion regulation strategies such as counting blessings and self-congratulation. As Quoidbach et al. (2010) showed, different emotion regulation strategies differ in their association with PA. Thus, while the current study clearly focuses on capitalizing, in the study by Jose et al. (2012) it is not possible to conclude what exact role capitalizing played in the moderation relationship as other savouring strategies might have cancelled out or reversed its impact. Another explanation for the current finding is that the reported positive event did not have to be the one participants capitalized on. Participants could have experienced a positive event within the last few hours but capitalized on an unrelated event that happened a year ago. While being present and consciously focusing on a positive event while experiencing it has been shown to increase PA (Erisman & Roemer, 2010; Quoidbach et al., 2010), talking about earlier positive experiences might distract the focus from a recent positive experience one just had. It is possible that capitalizing displaced the focus of recent positive events to earlier events and therefore weakened the impact of recent events on PA.

Other important considerations when interpreting the results include that capitalizing can come in different forms. Communicating via instant messaging did for example not show the same benefits on mood as in-person interactions (Seltzer et al., 2012), and Göritz (2007) showed that some, but not all web-based interventions that aim at enhancing positive affect are successful. In the current study, we did not differentiate between participants capitalizing in

person, via phone, or sharing positive experiences via texting or on social media. As excessive social media use and time spent on the phone have been shown to decrease PA and increase negative affect (NA) (Hughes & Burke, 2018; Schivinski et al., 2020), it is possible that in some cases the act of capitalizing online negatively altered the emotions initially evoked by the positive event which offers a possible explanation for the negative moderation effect. Furthermore, it has been shown that an active-constructive and sympathetic response by the conversation partner strongly amplifies the impact of capitalizing on PA (Lambert et al., 2013). As we did not differentiate between different forms of capitalizing, we were not able to consider different reactions or if participants received any reactions to their acts of capitalizing at all. Thus, we were not able to draw any precise conclusions about how these aspects of capitalizing modified the relation between positive events and PA.

As these impediments in interpreting the results show, there are a few limitations of the current study that need to be addressed. Since this study was part of a larger research project, it was necessary to restrict the experience sampling methodology (ESM) questionnaire to a few items per concept to keep it short and maximize compliance (Eisele et al., 2022). The extent to which participants capitalized has therefore been measured with only one item. Accordingly, additional information about the form of capitalizing (in person, via text message, post on social media) as well as about the reaction of conversation partners that we would have needed to better understand and interpret the results, was not available. Furthermore, this additional information would have given us more insights into how capitalizing in person and capitalizing digitally are different from each other in their impact on PA. Moreover, we looked at capitalizing and positive events in general, but the way our items were phrased did not enable us to draw conclusions about how capitalizing and the event a participant capitalized on are related to each other. Future research could therefore ask participants specifically if they have capitalized on the recent event they just rated instead of on any event.

In addition to the limitations concerning interpretation due to the phrasing of the items, a few more limitations regarding the study design need to be mentioned. First, to not go beyond the scope of this thesis, we did not examine the completion times of the ESM questionnaires. Both long and very short completion times can be indicators of careless and inaccurate responses (Myin-Germez & Kuppens, 2021). Thus, we cannot with certainty assume that participants filled out the questionnaires conscientiously. Further, since we applied convenience sampling, the sample cannot be considered representative of the entire population (Etikan et al., 2016). Convenience samples tend to advance biased estimates and therefore limit the generalizability of results (Jager et al., 2017). In the current study, the sample mainly

consisted of German students who additionally share the factor of being in the circle of acquaintances of the research team. If participants resemble each other on specific factors the results might be skewed and therefore not suitable for making inductive inferences (Emerson, 2015; Etikan et al., 2016). Lastly, as there was no experimental manipulation, we are only able to draw correlational and no causal conclusions. Therefore, we cannot ultimately assume that momentary capitalizing leads to increased positive affect, as it is also possible that happy people solely tend to capitalize more.

Despite these limitations, these results propose a number of theoretical and practical implications. Most importantly, our findings contribute to the increasing body of evidence for the relationship between capitalizing and PA. Although earlier findings were mixed, the majority found a positive relationship which we confirmed with an advanced study design. As PA has been identified to have several benefits for mental and physical health (Lyubomirsky et al., 2005; Pressman & Cohen, 2005: Watson et al., 1988), this is relevant for clinical practice as well as for wellbeing interventions in general. Seligman (2011, as in Bannink, 2017) pointed out that in order to achieve wellbeing, one must not only be free of pathology but also experience positive affect and meaning. Positive emotions more specifically have been suggested to be beneficial and support the recovery of depressed individuals (Sin & Lyubomirsky, 2009). In a clinical context, practitioners could therefore consider integrating capitalizing exercises in social skills training with clients. Further, since homework is common practice in some forms of therapy such as cognitive behavioural therapy (CBT) or positive CBT (Bannink, 2017), capitalizing exercises could serve as an extension of therapeutic progress between therapy sessions. For organizational and work psychology the findings offer a foundation for interventions that aim to encourage employees or students to capitalize in order to improve wellbeing and workplace atmosphere.

Although this study delivers valuable evidence for the relationship between capitalizing and positive affect its most important contribution may be that it raises a variety of intriguing questions for future studies. As some limitations regarding the phrasing of our items have been identified above, it would be useful to extend the findings by replicating the current study with a slightly adapted setup of the ESM questionnaire. To clarify the moderation effect of momentary capitalizing on the relationship between positive events and momentary PA, future studies should explicitly ask participants if they have capitalized on the recent positive event they rated in the positive-event-item before. Furthermore, to gain a better understanding of how the different concepts relate to each other, one should question the act of capitalizing more specifically. For this, items should be added that ask about the way of capitalizing (for example

in person, via text message, or sharing on social media) and the reactions participants received. Lastly, future research should build on the current findings with experimental study designs in order to examine if capitalizing causes positive affect or if people with higher PA solely tend to capitalize more.

In conclusion, we aimed to clarify the relationship between momentary capitalizing and momentary positive affect using experience sampling methodology. This study contributes to the growing body of evidence for the relationship between momentary capitalizing and momentary positive affect. Although it is still the duty of future research to clarify under which circumstances momentary capitalizing enhances or diminishes the relationship between positive events and momentary PA, this study brings about undeniable accomplishments. It expands the field of potential research questions in previously unexpected directions and might inspire fellow researchers to take a closer look at not only the advantages but also the limitations of savouring strategies. And lastly, it contributes to clinical practice and society by drawing well-deserved attention to the emotion-regulation strategy of capitalizing.

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Appendix A

Informed Consent

Dear participant,

Thank you for your participation in this study. Before you participate, it is important that you understand the goal of this research and what the study will ask from you. The purpose of this study is to find out mental health is related to the way you deal with feelings in daily life. To explore this relationship, we want to measure fluctuations in emotions in daily life.

For this study, we will ask you to fill in several questionnaires on your mobile phone. All questionnaires will be completed in the Ethica app. The study will start with a questionnaire concerning your demographics and general mental health. This initial questionnaire will take about 20 minutes to complete. Afterwards, you will receive four questionnaires per day for a period of two weeks. Notifications will remind you about the next questionnaire. One daily questionnaire takes approximately 3 minutes to complete. It is important that you answer the questionnaires as soon as possible. *Please make sure that you turn on the notifications for the Ethica app on your mobile device.*

The information that we collect from this research project will be kept confidential. This means that only the researchers have insight into your answers. All personal data (such as age, gender etc.) will be anonymized and will not be published and/or given to a third party. Your participation in this study is voluntary. You are free to withdraw from this study at any time and without giving a reason.

Contact information

If you have any questions regarding this study, you can contact the researchers of this research project Jasmin Wallner (j.wallner@student.utwente.nl), Paula Oberle (p.v.oberle@student.utwente.nl), Natalie Koop (n.koop@student.utwente.nl), Caroline Dauer (v.c.dauer@student.utwente.nl), Kia Lemmen (k.r.lemmen@student.utwente.nl) and Jenny Schwabe (j.schwabe@student.utwente.nl).

Consent

I have read and understood the information provided and had the opportunity to ask questions. I understand that my participation is voluntary and that I am able to withdraw at any time, without a reason or cost. I hereby voluntarily agree to take part in this study.

Appendix B

Baseline Questionnaire

Demographics

- How old are you?
- What gender do you identify as? (Female, Male, Other, If you prefer not to specify, you can skip this question)
- What is your nationality? (Dutch, German, Other)
- What is your current occupation? (Working, Self-employed, Student, Studying and Working, Not working, Other)
- What is the highest degree or level of school that you have completed? *If currently enrolled, mark the highest degree already received. (*Middle school (such as MBO, MTS, MEAO or Haupt- or Realschule), High school (such as HAVO, VWO, HBS or Gymnasium/Berufsschule/Berufskolleg), Bachelor, Master, PhD, Other)
- If you are a participant of SONA please indicate here your SONA number. Note: You can find the number in the confirmation email received from SONA. It is important to give us your number because otherwise, we cannot identify you and grant you the points. If you are not a SONA participant, you can skip this question.

MHC-SF (Trait mental health)

Below are some statements about feelings and thoughts. Please indicate how often you felt this way during the past month. (Never, Once or Twice, About once a week, about 2 or 3 times a week, Almost every day, Every day)

1. Please indicate how often you felt happy during the past month
2. Please indicate how often you felt interested in life during the past month
3. Please indicate how often you felt satisfied with life during the past month
4. Please indicate how often you felt that you had something important to contribute to society during the past month
5. Please indicate how often you felt that you belonged to a community during the past month
6. Please indicate how often you felt that our society is a good place, or is becoming a better place for all people during the past month

7. Please indicate how often you felt that people are basically good during the past month

8. Please indicate how often you felt that the way our society works makes sense to you during the past month

9. Please indicate how often you felt that you liked most parts of your personality during the past month

10. Please indicate how often you felt good at managing the responsibilities of your daily life

11. How often did you feel hat you had warm and trusting relationships with others during the past month

12. How often did you feel hat you had experiences that challenged you to grow and become a better person during the past month

13. How often did you feel confident to think or express your own ideas and opinions during the past month

14. How often did you feel that your life has a sense of direction or meaning to it during the past month

GAD-7 (Anxiety)

Over the last two weeks, how often have you been bothered by the following problems? (Not at all, several days, more than half of the days, nearly every day)

1. Feeling nervous, anxious, or on edge
2. Not being able to stop or control worrying
3. Worrying too much about different things
4. Trouble relaxing
5. Being so restless that it is hard to sit still
6. Becoming easily annoyed or irritable
7. Feeling afraid as if something awful might happen

PHQ-9 (Depression)

Over the last two weeks, how often have you been bothered by the following problems? (Not at all, several days, more than half of the days, nearly every day)

1. Little interest or pleasure in doing things
2. Feeling down, depressed, or hopeless

3. Trouble falling or staying asleep, or sleeping too much

4. Feeling tired or having little energy

5. Poor appetite or overeating

6. Feeling bad about yourself or that you are a failure, or have let yourself or your family down

7. Trouble concentrating on things, such as reading the newspaper or watching television

8. Moving or speaking so slowly that other people could have noticed. Or the opposite, being so fidgety or restless that you have been moving around a lot more than usual

9. Thoughts that you would be better off dead, or hurting yourself

Perceived stress scale

Below are some statements about the recovery from stress. Please indicate how much you agree or disagree with each of the statements. (Strongly disagree, disagree, neutral, agree, strongly agree)

I tend to bounce back quickly after hard times.

I have a hard time making it through stressful events.

It does *not* take me long to recover from a stressful event.

It is hard for me to snap back when something bad happens.

I usually come through difficult times with little trouble.

I tend to take a long time to get over set-backs in my life

Brief resilience scale

Please indicate to what degree you agree with each of the following statements (0 never, 1 almost never, 2 sometimes, 3 fairly often, 4 very often)

In the last month, how often have you been upset by something that happened unexpectedly?

In the last month, how often have you felt that you were unable to control the important things in your life?

In the last month, how often have you felt nervous and stressed?

In the last month, how often have you felt confident about your ability to handle your personal problems?

In the last month, how often have you felt that things were going your way?

In the last month, how often have you found that you could not cope with all the things that you had to do?

In the last month, how often have you been able to control irritations in your life?

In the last month, how often have you felt that you were on top of things?

In the last month, how often have you been angered because of things that happened that were outside of your control?

In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Cognitive reappraisal

Please indicate to what degree you agree with each of the following statements (strongly disagree, mostly disagree, somewhat disagree, neither agree or disagree, somewhat agree, mostly agree, strongly agree)

1. When I want to feel a more positive emotion (such as joy or amusement) I change what I am thinking about
2. When I want to feel less negative emotion (such as sadness or anger) I change what I am thinking about
3. When I am faced with a stressful situation, I make myself think about it in a way that helps me stay calm
4. When I want to feel more positive emotion, I change the way I am thinking about the situation
5. I control my emotions by changing the way I think about the situation I am in
6. When I want to feel less negative emotion, I change the way I am thinking about the situation

Trait capitalizing

1. I am the type of person who loves to share it with others when something good happens to me
2. I almost always let the people that I am close to know when I feel good and why
3. I usually keep good feelings bottled up and don't share them very often
4. I am constantly telling people my good news

Rumination

State how often do you think in the following manner when experiencing threatening or stressful life events (Almost never, occasionally, frequently, almost always)

1. I think that I have to accept that this has happened
2. I think that I have to accept the situation
3. I think that I cannot change anything about it
4. I think that I must learn to live with it
5. I often think about how I feel about what I have experienced
6. I am preoccupied with what I think and feel about what I have experienced
7. I want to understand why I feel the way I do about what I have experienced
8. I dwell upon feelings the situation has evoked in me

Savouring

For each statement listed below, please select the one number that best indicates how true the particular statement is for you. There are no right or wrong answers. Please be as honest as you can. (strongly disagree, disagree, somewhat disagree, neutral, somewhat agree, agree, strongly agree)

1. Before a good thing happens, I look forward to it in ways that give me pleasure in the present.
2. It's hard for me to hang onto a good feeling for very long.
3. I don't like to look forward to good times too much before they happen.
4. I know how to make the most of a good time.
5. I feel a joy of anticipation when I think about upcoming good things.
6. When it comes to enjoying myself, I'm my own "worst enemy."
7. For me, anticipating what upcoming good events will be like is basically a waste of time.
8. When something good happens, I can make my enjoyment of it last longer by thinking or doing certain things.
9. I can enjoy pleasant events in my mind before they actually occur.
10. I can't seem to capture the joy of happy moments.
11. It's hard for me to get very excited about fun times before they actually take place.
12. I feel fully able to appreciate good things that happen to me.

13. I can make myself feel good by imagining what a happy time that is about to happen will be like.

14. I don't enjoy things as much as I should.

15. When I think about a pleasant event before it happens, I often start to feel uneasy or uncomfortable.

16. It's easy for me to enjoy myself when I want to.

Appendix C

Experience Sampling Methodology (ESM) Questionnaire

Positive and negative affect

Below you can find several questions about your current feelings. Please try to indicate how you felt right before you started to answer the questionnaire (1 not at all – 7 very much)

1. How *cheerful* do you feel right now?
2. How *enthusiastic* do you feel right now?
3. How *satisfied* do you feel right now?
4. How *relaxed* do you feel right now?
5. How *anxious* do you feel right now?
6. How *irritable* do you feel right now?
7. How *down* do you feel right now?
8. How *sad* do you feel right now?

Perceived stress

How stressed do you feel right now?

Positive and stressful events

- Think of the most striking event or activity in the last hour. How (un)pleasant was this event or activity? (-3 very unpleasant – 3 very pleasant)
- Think of the most striking event or activity in the last hour. How stressful was this event or activity? (1 not at all – 7 very much)

Social context

- Who are you with right now? (Family member, friend, romantic partner, co-worker/ fellow student, unknown people/ others, I am alone)

Cognitive reappraisal

- In the last hour, I was able to appreciate good things that happened to me. (1 not at all – 7 very much)

- In the last hour, I controlled negative feelings by changing the way I think about the situation I am in
- In the last hour, I tried to look at the cause of my negative feelings from a different perspective

Capitalizing

- In the last hour, I let other people know about positive things I experienced (these can also be small positive things)

Rumination

- In the last hour, I have been thinking about my problems
- In the last hour, I had repetitive thoughts about my problems

Savouring

- In the last hour, I was able to appreciate good things that happened to me
- In the last hour, I was getting pleasure from looking forward to positive events or activities

Acceptance

In the last hour, I could let go of my negative feelings without acting upon them