



# The Implicit Affiliation Motive, Evaluations of Social Life Events, and Life Satisfaction: Findings from a Cross-Cultural Study with German and Zambian Adolescents

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## Abstract

Positively and negatively evaluated life events are associated with individuals' life satisfaction. In the present study, we tested whether the link between individuals' evaluations of life events in the social domain and their satisfaction with life is moderated by their implicit affiliation motive. Adolescent participants were recruited in Germany and Zambia. First, data on the implicit affiliation motive and life satisfaction were gathered. Approximately six to eight months later, adolescents reported on their life satisfaction again and indicated the recent occurrence of life events in the social domain. Moreover, they reported on the affective quality of those events. Analyses showed that positive evaluations of social life events predict life satisfaction only among adolescents characterized by a strong affiliation motive. This moderation effect was not qualified by individuals' cultural background. Findings are discussed with respect to universal effects of implicit motives on individuals' life satisfaction.

**Keywords** Life events · Life satisfaction · Implicit affiliation motive · Culture

## 1 Introduction

Life satisfaction has been a significant topic in psychological research for many years. In general, life satisfaction can be predicted by the interaction of situational and personal variables. For example, although critical life events might have an effect on life satisfaction, individuals might be differently affected by critical life events depending on their personality dispositions (Schwarzer & Luszczynska, 2013). Critical life events do not only differ in their perceived affective quality, but also in the domain they affect. While the loss of a loved one, for instance, can be attributed to the interpersonal or social domain, a promotion concerns individuals' work life. In the present study, we focus on the relationship of the evaluated affective quality of social life events with life satisfaction in German and

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Zambian adolescents. Moreover, we examine to what extent this relationship is qualified by adolescents' implicit affiliation motive, that is, their need for establishing and maintaining close relationships with other people.

## 1.1 Theoretical Background

Life satisfaction is a major component of subjective well-being. Rather than reflecting one's current level of happiness, which is often temporarily affected by individuals' thoughts and behavior (Gilbert, 2009), it represents an evaluation of how pleased a person is with their life in general (for an overview, see Tov, 2018). This evaluation is based on personal criteria, standards, and principles (e.g., Diener & Emmons, 1984; Diener et al., 1985). In other words, although there are many factors that could possibly contribute to life satisfaction (e.g., social relationships, health status, work), its evaluation is solely determined by personally meaningful factors and events.

Being satisfied with one's life is a highly desirable goal and associated with various positive correlates such as higher self-esteem (Diener & Diener, 1995) and more stable relationships (Luhmann et al., 2013). Therefore, research aims to identify factors that, both positively and negatively, predict satisfaction with life.

In a meta-analysis, Luhmann et al. (2012) found that critical life events were longitudinally related to changes in life satisfaction. Also, Emmons (1991) reports detrimental effects of particularly stressful life events (e.g., moving to another country) on individuals' distress and affective well-being. Yet, the effects of life events on well-being do not result from the alleged desirability of an event (see Luhmann et al., 2012), but rather reflect whether life events support or hinder individuals in their goal striving: For example, people particularly striving for realizing achievement-related goals were particularly affected by achievement events.

In general, research shows that positive interpersonal relationships are a resource that can enhance well-being (e.g., Baumeister & Leary, 1995) but also buffer aversive effects of stress (McMahon et al., 2020). Yet, research also suggests that these positive effects of interpersonal relationships might not be equal for all people. Individuals significantly differ in the importance they assign to specific life domains that potentially contribute to satisfaction with life (Diener et al., 1985). Additionally, findings in the context of implicit-explicit-motive congruence show that the pursuance of conscious goals only predicts an increase in somatic and affective well-being if goals correspond to the respective implicit motive, that is, if an individual manages to set goals that match the strength of their implicit motives (Baumann et al., 2005; Brunstein et al., 1998). In line with these findings, Hofer et al. (2006) showed across diverse cultural contexts that commitment to values emphasizing positive interpersonal relationships and behavior only predicted increased life satisfaction for individuals with a pronounced implicit affiliation motive.

Implicit motives are hypothesized to develop in preverbal childhood (McClelland & Pilon, 1983; McClelland et al., 1989). They are defined as relatively stable personality dispositions that entail positive (incentive) or negative (disincentive) affective responses to specific situational cues (e.g., Schultheiss & Köllner, 2014). Correspondingly, they enable individuals to experience certain categories of incentives as rewarding (Atkinson, 1957; McClelland, 1987; Schultheiss & Köllner, 2021), that is, to enjoy specific characteristics of a situation that satisfy a corresponding implicit motive. Consequently, implicit motives are assumed to energize, select, and orient individuals' behavior (McClelland, 1987). Research traditionally focuses on three basic implicit motives (e.g., Brunstein & Schultheiss, 2010):

the achievement motive (i.e., the striving for a standard of excellence; McClelland et al., 1953), the affiliation-intimacy motive (i.e., the preoccupation with (re-)establishing and maintaining interpersonal relationships; Heyns et al., 1958), and the power motive (i.e., the desire for having an impact or influencing others; McClelland, 1975).

As mentioned above, positive interpersonal relationships and pursuing affiliation-themed strivings generally show beneficial effects on well-being (Emmons, 1991; McMahon et al., 2020). Importantly though, interpersonal life events especially predicted the well-being of individuals characterized by a strong focus on affiliation in their goal striving. Thus, evidence suggests that implicit motives determine in how far critical life events affect individuals' affective and cognitive facets of well-being (cf. Neumann & Schultheiss, 2015). That is, whether the affective characteristics of a life event (i.e., its incentives or disincentives) are experienced as more or less rewarding depends on the strength of the individual's implicit motive (Schultheiss & Köllner, 2014).

Individuals with a pronounced implicit affiliation motive, for instance, report higher levels of affective well-being and life satisfaction when committing to and successfully realizing affiliation goals than do individuals with a weak implicit affiliation motive (Hofer & Chasiotis, 2003; Schultheiss et al., 2008). Likewise, a given critical life event might be differently assimilated by individuals depending on the strength of their implicit motive. For example, the strength of the implicit affiliation motive determines individuals' sensitivity towards cues indicating either interpersonal harmony or social rejection (e.g., Schultheiss & Köllner, 2014). Thus, disputes with a friend might have particularly detrimental effects on life satisfaction among people characterized by a high implicit affiliation motive. Similarly, individuals characterized by a high implicit affiliation motive might particularly benefit from positive social life events (e.g., making new friends). In contrast, the life satisfaction of people characterized by a low implicit affiliation motive might be relatively unaffected by social life events, even if the affective quality of these events was evaluated as being more or less positive/negative.

Summing up, research often focuses on individuals' internal and/or external resources to explain effects of critical life events on well-being. Yet, research also demonstrates that implicit motive strength helps to explain effects of domain-specific goal striving on affective and cognitive components of individuals' well-being (e.g., Brunstein & Schultheiss, 2010). In the present research, we combine these lines of research and focus on the implicit affiliation motive as a (trait-like) moderator of the relationship between the evaluation of critical life events in the social domain and life satisfaction. Thus, we assume that the strength of the implicit affiliation motive does not only predict effects of realization of affiliation goals that an individual voluntarily commits to (e.g., Hofer & Chasiotis, 2003) but also of less predictable social life events on life satisfaction. In our study, we emphasized effects on life satisfaction that is particularly determined by personally meaningful events. Thereby, we implemented a longitudinal, cross-cultural design.

## 1.2 Cultural Context

There has long been a clear trend in cross-cultural psychology towards testing for cross-cultural differences (see Brouwers et al., 2004). Yet, there is growing interest on testing if a given construct has equivalent effects or shows equivalent relationships with other constructs across cultural contexts (e.g., Kashima et al., 2005). Implicit motives have repeatedly been found to have comparable effects in diverse cultural contexts (Hofer & Busch, 2011; Hofer & Chasiotis, 2003; Hofer et al., 2006, 2010, 2015).

If, as it is the case with the present study, research aims at testing the cross-cultural generalizability of effects, it is recommended to consider highly diverse cultural contexts (Van de Vijver & Leung, 1997). Thus, samples from an individualistic (Germany) and a collectivistic (Zambia) cultural context were recruited for the present research. Collectivistic and individualistic cultural contexts significantly differ from each other in variables characterizing cultural contexts in psychological terms such as value orientations at both, the individual and the group level (Schwartz, 1992). While the value of autonomy, for instance, holds more importance in individualistic cultures, the value of tradition was found to be of higher importance in collectivistic cultural contexts (Schwartz, 1994; Triandis, 1996).

Previous cross-cultural research (e.g., Hofer & Chasiotis, 2003) but also findings based on analyses of the samples at hand (Hofer et al., 2021; Lehmann et al., 2021) verified such distinct differences between German and Zambian participants in value orientations and thus, affirmed the theory-driven selection of cultural contexts: German participants place much more importance on values reflecting self-direction in life and readiness for change than participants in Zambia. In contrast, people in Zambia emphasize values reflecting social stability and a strong sense of community significantly more highly than do people in Germany.

### 1.3 The Present Research

Based on findings on the association between the prevalence of life events and indicators of well-being, we assumed that evaluations of life events occurring between both measurement occasions (i.e., T1 and T2) predict life satisfaction of adolescents at T2. Yet, individuals' implicit affiliation motive, measured at T1, is hypothesized to moderate this association: We expect to find a significantly positive link between evaluations of life events and life satisfaction only among individuals characterized by a high implicit affiliation motive, that is, among individuals who highly desire relationships with others. Given findings on universal effects of implicit motives, we hypothesize that adolescents' culture of origin does not affect the assumed moderating effect of the implicit affiliation motive.

## 2 Methods

### 2.1 Sample

*Participants.* Data for testing the hypotheses at hand were taken from a longitudinal cross-cultural project on development in adolescence (see, e.g., Hofer et al., 2021; Lehmann et al., 2021). In the present paper, we present data from German and Zambian adolescents assessed at the first and second measurement occasions, which both took place in 2018.

Based on ethnic (tribal) and/or linguistic affiliations, Zambia is described as a multi-ethnic nation of mostly Bantu-speaking groups. Although more than 70 groups are listed in the 2000 census, most Zambians belong to one of nine main ethnolinguistic groups (Posner, 2005). While in rural areas each ethnic (linguistic) group is concentrated in a particular geographic region, representatives of all of these main ethnic groups live in Lusaka (Kula & Lutz, 2008), the capital of Zambia and location of the present data collection. Recruitment was not restricted to any particular ethnic/linguistic group, as ethnic groups of Bantu origin share cultural orientations that typically reflect a collectivistic pattern of

norms and values. Referring to the German subsample, all adolescents were born and raised in Germany.

In total, data of 303 German (167 females) and 212 Zambian (100 females) adolescents who provided complete data sets on the implicit affiliation motive (T1), prevalence of (social) critical life events (T2), and life satisfaction (T1 and T2) were included in the present study sample. Gender distribution does not differ significantly between both cultural samples. At T2, participants were between 12 and 21 years of age ( $M=15.41$ ;  $SD=1.60$ ). German and Zambian participants as well as female and male adolescents do not significantly differ in age. At T1, adolescents who visited grades seven to eleven were recruited at three secondary schools in the southwestern part of Germany and two secondary schools in Lusaka, Zambia.

## 2.2 Procedure

The Research Ethics Committee of the University of Zambia and the local school authority in Rhineland Palatinate (Germany) approved the study. Moreover, administrators of secondary schools and parents were informed about the study. Parents of younger adolescents were asked for permission and prior to data assessments, participants signed an informed consent form. Adolescents voluntarily participated in the study and were guaranteed that any information given would be treated confidentially and anonymously by using a non-personal code of participation. At the end of the first data collection, students were asked to indicate their willingness to participate in subsequent data assessments. In both research regions, participants received monetary compensation. Per measurement occasion, German students received 10 € and Zambian students, following advice given by our local collaborators, 2.5 €.

At the first measurement occasion, German and Zambian adolescents took the questionnaire during free periods at school premises. Trained local research assistants supervised sessions. Data assessment at T2 took place approximately 7.5 months ( $SD=1.38$ ) after T1. Zambian students took the questionnaire again during free lessons at school premises. In agreement with local school authorities, data collection was moved to an online format for German students to keep disturbances of school lessons at a low level. Thus, adolescents in Germany were informed about data assessment at T2 during school lessons and received a link to respond to an online-version of the questionnaire.

Students in Germany received German versions of instruments. English is one of the official languages in Zambia and is predominantly used in administration, business, and higher education. Thus, questionnaires were given to Zambian adolescents in English. English and German versions of all measures were at hand.

## 2.3 Measurements

At T1, initially the implicit affiliation motive ( $n$  Affiliation) was assessed. Next, adolescents reported on life satisfaction and psychological constructs not relevant for the analyses at hand (e.g., dimensions of identity development). At T2, adolescents provided data on life events and again on life satisfaction.

*Implicit affiliation motive.* The strength of  $n$  Affiliation was assessed by a Picture Story Exercise (PSE; McClelland et al., 1989), the well-established measure for the assessment of implicit motives. We used standard instructions for PSE recommended by Smith and colleagues (1992): Adolescents were told that we would present a number of pictures to

them. They were asked to imagine what happens in the depicted situation and write a story about the people shown in the picture. It was highlighted that there are no right or wrong stories. Each picture cue was shown for 30 s and subsequently, adolescents were given five minutes to write a story on it. As a reminder to compose a complete story, the following questions were printed on each story sheet: 1. What is happening? Who are the people? 2. What has led up to this situation? That is, how did the story begin? 3. What are the people thinking about, what do they want, and how do they feel? 4. What will happen? How will the story end? (see Smith et al., 1992, for details on instructions for PSE measurements).

To assess *n* Affiliation, we used six picture cards that have proven to be applicable in cross-cultural research on implicit motives (e.g., Hofer et al., 2010) in the following order: *couple by a river*, *ship captain*, *women in a lab*, *night club scene*, *boxer*, and *four men seated at a table* (for reprints see McClelland, 1975; McClelland & Steele, 1972; Smith, 1992). The picture set possessed an adequate pull for *n* Affiliation leading to a valid measure of the target motive (Smith et al., 1992; see also Schultheiss & Brunstein, 2001).

Stories were coded for motive images according to guidelines set forth in the well-established manual provided by Winter (1994; see also for details on scoring rules; e.g., sentence rule, scoring of denied or negated actions). In general, a motive image is an action, a wish or concern, or some other internal state which any character, group, or institution in a story attributes to self, to some other person, to a group or institution, or to people in general. In detail, any expression in the stories indicating friendly relationships is scored for *n* Affiliation. Those statements are (1) mentioning of positive feelings towards others, (2) regret about the disruption of a relationship, (3) friendly companionate activities, or (4) friendly nurturant acts.

Picture stories were coded by four well-trained German research assistants who all achieved percentage agreements of 85% or higher with training material prescored by experts (Winter, 1994). Moreover, initially, 20 full sets of picture stories were coded by all four assistants. By applying a two-way, random effects model with absolute agreement, the intraclass correlation (ICC; see Shrout & Fleiss, 1979) was 0.851 for *n* Affiliation and thus pointing to a good interrater reliability (single measure reliability). Consequently, each assistant independently coded a different set of the remaining picture stories. Additionally, scoring problems were resolved by discussion in frequent team sessions. The number of affiliation motive imageries totaled across stories ranged from 0 to 16 ( $M=4.69$ ;  $SD=2.49$ ). Protocol length ranged from 145 to 786 words ( $M=424.92$ ;  $SD=104.65$ ). Number of motive images significantly correlated with word count ( $r=0.437$ ;  $p<0.001$ ). Thus, confounding effects of protocol length on motive scores were corrected by regression across cultural groups: Number of motive imageries was regressed on protocol length to determine the final score for *n* Affiliation (unstandardized residual scores).

In cross-cultural research, measurement equivalence is a crucial topic that has to be examined. With respect to *n* Affiliation, there is evidence for the construct's applicability in various cultural contexts (see e.g., Hofer et al., 2005, 2015). In addition, most picture cues stimuli used for the assessment of *n* Affiliation in the study at hand have been successfully applied in cross-cultural research on implicit motives (e.g., Hofer et al., 2015). As, however, cross-cultural research on implicit motives is still scarce, particularly in sub-Saharan cultural contexts, the picture cues were scrutinized for item/picture bias, that is, differential item functioning, by use of analysis of variance (Van de Vijver & Leung, 1997).

The single item/picture score for *n* Affiliation was the dependent variable in single analyses. Cultural group (2 levels) and score level (3 levels) were included as independent factors. Based on the totaled score for *n* Affiliation across the six picture stimuli, score level was determined by splitting the sample into three equally sized score-level groups

(low-medium-high). In analyses, a significant effect of score level is expected to be found as adolescents at higher score levels ought to score higher on a given picture stimuli. In contrast, significant effects of cultural group and the interaction of cultural group and score level would indicate bias. Thereby, uniform bias is indicated by a significant effect of culture, i.e., even if adolescents have similar total test scores, participants from one group score higher/lower than individuals from other groups across all score levels. In addition, a significant interaction term (cultural group by score level) indicates non-uniform bias, that is, the difference between cultural groups depends on the level of the underlying trait (Van de Vijver & Leung, 1997).

As expected, score level (i.e., motive strength) significantly predicts scoring of *n* Affiliation for each of the six picture cards ( $F_{s_{2, 509}}$  range from 7.64 to 81.84;  $ps < .001$ ;  $\eta^2$ s range from 0.029 to 0.243). Moreover, analyses indicated the absence of both uniform ( $F_{s_{1, 509}} \leq 0.46$ ;  $ps \geq .499$ ;  $\eta^2$ s  $\leq 0.001$ ) and non-uniform bias ( $F_{s_{2, 509}} \leq 1.42$ ;  $ps \geq .242$ ;  $\eta^2$ s  $\leq 0.006$ ) for the following four picture cues: ship captain, women in a lab, nightclub scene, and boxer. In bias analyses on the picture cue *couple by a bridge*, findings do not point to uniform bias ( $F_{1, 509} = 0.50$ ;  $p = .478$ ;  $\eta^2 = 0.001$ ) but seem to indicate non-uniform bias at first glance ( $F_{2, 509} = 3.21$ ;  $p = .041$ ;  $\eta^2 = 0.012$ ). That is, highly affiliation-motivated German adolescents seem to be scored particularly high for affiliation for this specific picture cue. However, the effect is clearly not large enough to be practically important ( $\eta^2 \geq 0.06$ ; see Meiring et al., 2005). Surprisingly, analyses on the picture cue *four men seated at a table* suggest the presence of uniform ( $F_{1, 509} = 10.91$ ;  $p = .001$ ;  $\eta^2 = 0.021$ ) and non-uniform bias ( $F_{2, 509} = 5.27$ ;  $p = .005$ ;  $\eta^2 = 0.020$ ) in our study sample(s). Although we did not intend to compare cultural groups in motive strength and the effect sizes are below the threshold recommended by Meiring and colleagues (2005), we excluded the picture cue from further analyses as it showed slight indications of bias. Thus, the strength of the implicit affiliation motive was recalculated on basis of the reduced picture set and the resulting score was used in subsequent analyses.

*Life satisfaction at T1 and T2.* At both measurement occasions, data on individuals' life satisfaction were collected by administering the widely used Satisfaction With Life Scale (SWLS; Diener et al., 1985). The SWLS includes five items to measure one's global satisfaction with life. Each item (e.g., I am satisfied with my life) is rated on a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree). The mean of the five item evaluations is calculated to produce an overall score. The scale has been widely used to measure the life satisfaction of different age groups in various cultural contexts (e.g., Hofer et al., 2007). With respect to the total sample, Cronbach's Alphas for life satisfaction were .710 at T1 (German sample: .801; Zambian sample: .555) and .746 at T2 (German sample: .798; Zambian sample: .632). In both subsamples, none of the life satisfaction items showed a low item-scale correlation ( $r_{it,s} \geq 0.20$ ). Thus, item exclusion was not an option to increase Cronbach's alpha.<sup>1</sup> We could refrain from an in-depth examination of measurement

<sup>1</sup> Our analyses did not focus on mean comparisons of life satisfaction between German and Zambian adolescents (i.e., scalar invariance) and configural and metric invariance of the SWLS has repeatedly confirmed across different cultural and age groups (including adolescent samples of different ages; e.g., Jovanović et al., 2021). Nevertheless, there is also evidence of age-related effects on scale reliability of the SWLS. In particular, the fit of two items (So far I have gotten the important things I want in life; If I could live my life over, I would change almost nothing) for the assessment of life satisfaction in adolescence is challenged (e.g., Glaesmer et al., 2011; Hultell & Gustavsson, 2008). Thus, we dropped both items and recalculated adolescents' life satisfaction. Consequently, Cronbach's Alphas somewhat decreased in the German subsample (T1:  $\alpha = .781$ ) but slightly increased in the Zambian subsample (T1:  $\alpha = .596$ ). Rerunning all subsequent analyses with the reduced three-item life satisfaction scale resulted in findings that exactly mirror the ones reported in text.



invariance of the SWLS as there is clear evidence on its cross-cultural applicability (e.g., Diener & Diener, 1995).

*Assessment and evaluation of social life events.* At T2, adolescents were asked about life events that have occurred since the first measurement occasion. They were given a list of 19 life events that have mostly been taken from the Social Readjustment Rating Scale (SRRS) by Holmes and Rahe (1967). In detail, items were selected to represent different life domains: friendship (three items; e.g., major changes in close friendships), relationship (two items; break-up with partner; start of a new relationship), family and health (eight items; e.g., death of a close family member; birth of a sibling), school education (three items; e.g., personal achievement at school), and general life (three items; e.g., contests). Each set of items was introduced by a brief description pointing to the life domain under consideration. If adolescents indicated the occurrence of a given life event, they were asked to rate its affective quality on a 5-point Likert scale (1 = very negative to 5 = very positive).

Given the focus of the present paper with its emphasis on *n* Affiliation, only the 13 items assigned to the social life domains of friendship, relationship, and family and health were used in subsequent analyses. On average, adolescents experienced three social life events since T1 ( $M = 2.93$ ;  $SD = 1.99$ ;  $range = 0$  to 10). Nine Zambian and 29 German adolescents indicated that they experienced none of the life events. Thus, their data was excluded from further analyses as no affective evaluations of life events were available. A mean score of affective evaluations for the life events was calculated for the remaining 477 adolescents ( $M = 3.03$ ;  $SD = 1.04$ ). Thus, the scale represents adolescents' current mean affective evaluation of life events in the social domain over the past few months (from T1 to T2), provided any life event had occurred during that time. As such, it indicates if the participant regards changes in their social life circumstances as negative or positive on average. Higher scores indicate a more positive evaluation of life events in the social domain. Given that single life events are independent of each other, statistical values of the scale (mean score) were not examined in detail. Similarly, we could refrain from an examination of measurement equivalence.

### 3 Results

Results are presented in the following order: First, general statistics of and correlations among measures are given. Moreover, effects of participants' sociodemographic characteristics on life satisfaction at T2, i.e., the dependent variable in the hypothesized moderation model, are reported. Next, findings on the hypothesized moderation effect of *n* Affiliation on the link between evaluation of social life events and life satisfaction and its significance across cultural samples are presented.

#### 3.1 Section 1: Descriptive Statistics of and Correlations Among Measures

In Table 1, descriptive statistics of measures for both cultural samples and correlations among psychological constructs as well as with age and gender for the total sample are given.

As presented in Table 1, *n* Affiliation shows a weak but significant correlation with life satisfaction at T1 but not at T2. Both indices of life satisfaction are significantly correlated with each other but show no significant associations with evaluations of social life events. Moreover, *n* Affiliation and evaluations of social life events are not significantly related to



**Table 1** Descriptive statistics and correlations among measures

	1	2	3	4	<i>M (SD)</i> (GER)	<i>M (SD)</i> (ZAM)
1 <i>n</i> Affiliation	–				.26 (1.96)	– .37 (1.48)
2 Social life events <sup>1</sup> (affective evaluations)	– .042	–			2.95 (1.01)	3.14 (1.08)
3 Life satisfaction (T1)	.111*	.006	–		5.12 (1.06)	4.49 (1.08)
4 Life satisfaction (T2)	.076	.045	.637***	–	5.18 (1.03)	4.46 (1.11)
5 Age	– .072	– .069	– .151**	– .138**	–	–
6 Sex <sup>2</sup>	– .093*	.046	.081(*)	.079(*)	–	–

(\*)  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Note 1:  $n = 477$ ; 2: female adolescents are coded 0

each other. Additional analyses also show non-significant associations between *n* Affiliation and a) number of social life events reported by adolescents ( $r = -0.026$ ;  $p = .555$ ) as well as b) dispersion of social life events evaluations ( $r = -0.044$ ;  $p = .403$ ). The latter analysis is based on data of 371 adolescents who reported on more than one critical life event.

A higher age is significantly associated with lower levels of life satisfaction at both measurement occasions. Finally, female adolescents scored higher for *n* Affiliation but reported slightly lower levels of life satisfaction at T1 and T2. Thus, age and sex were included in subsequent moderation analyses. We could refrain from testing whether corresponding pairs of correlations significantly differed from one another in cultural groups, as it was examined in subsequent analyses whether culture moderates relationships between psychological constructs.

### 3.2 Section 2: Test of a Moderation Effect of *n* Affiliation

We hypothesized that life satisfaction at T2 is predicted by the interplay of evaluations of social life events and the strength of *n* Affiliation. That is, a positive association between evaluations of social life events and life satisfaction was assumed to be found for individuals high in *n* Affiliation. In analyses, participants' sex, age at T2, and life satisfaction at T1 are included as covariates as they showed significant correlations with life satisfaction and *n* Affiliation. Additionally, culture is included as covariate in the first leg but used as possible moderator of relationships in the second leg of analyses.

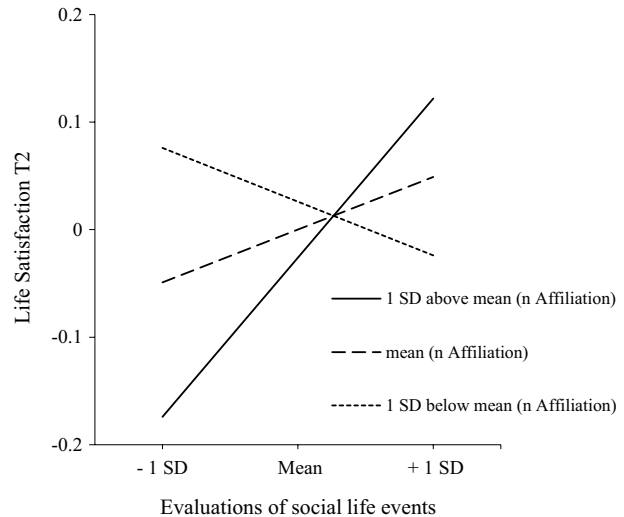
The hypothesized models were tested by applying PROCESS macro for SPSS (version 2.16; see Hayes, 2018). In the first leg of analyses, the template for moderation (model 1) was used. Variables included in interaction terms were mean centered. Findings of first leg analyses are presented in Table 2.

Coefficient estimates shown in Table 2 indicate that there are no significant main effects of evaluation of social life events and *n* Affiliation. Moreover, age and sex do not significantly predict life satisfaction at T2. However, life satisfaction at T1 and participants' culture (German adolescents report higher levels of life satisfaction) are significantly related to life satisfaction at T2. Most importantly, a significant interaction could be verified ( $F_{1, 469 \text{ change}} = 8.064$ ;  $R^2_{\text{change}} = .010$ ;  $p = .005$ ). Screening conditional effects at three values of *n* Affiliation, i.e., the mean, at one standard deviation below and at one standard deviation above the mean, indicate that a positive significant association

**Table 2** Moderation effect of *n* Affiliation on the link between the evaluation of life events and life satisfaction at T2

Outcome	<i>B</i> ( <i>S.E.</i> )	<i>t</i> -value	<i>F</i> -value	<i>R</i> <sup>2</sup>
Life satisfaction (T2)			50.558*** df = 7, 469	.430
Evaluation of life events (T1 to T2)	.049 (.038)	1.300		
<i>n</i> Affiliation (T1)	-.016 (.022)	-.730		
Evaluation of life events (T1 to T2) * <i>n</i> Affiliation	.060 (.021)	2.839**		
Life satisfaction (T1)	.575 (.037)	15.624***		
Age	-.036 (.025)	-1.470		
Sex	.111 (.079)	1.415		
Culture	-.346 (.083)	-4.182***		

(\*)  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Fig. 1** Adolescents' life satisfaction (T2) and its relationship to the association of evaluations of social life events with *n* Affiliation

between evaluation of social life events and life satisfaction are only found at high levels of *n* Affiliation ( $B = 0.153$ ;  $SE = 0.052$ ;  $t = 2.961$ ;  $p = .003$ ). Associations were significant neither at medium ( $B = 0.048$ ;  $SE = 0.038$ ;  $t = 1.277$ ;  $p = .202$ ) nor at low levels of the moderator ( $B = -0.061$ ;  $SE = 0.055$ ;  $t = -1.111$ ;  $p = .267$ ; see Fig. 1).

In final analyses, we examined whether culture affects relationships between variables in the assumed model. In analyses, we used the template for moderated moderation (model 3).

As findings reported in Table 3 show, cultural group does not qualify relationships between variables. None of the additional interaction terms reached significance. In

**Table 3** Effects of cultural group on the moderation effect of *n* affiliation

Outcome	<i>B</i> ( <i>S.E.</i> )	<i>t</i> -value	<i>F</i> -value	<i>R</i> <sup>2</sup>
Life satisfaction (T2)			35.830*** df = 10, 466	.435
Evaluation of life events (T1 to T2)	.053 (.039)	1.380		
<i>n</i> Affiliation (T1)	-.021 (.023)	-.914		
Evaluation of life events * <i>n</i> Affiliation	.072 (.022)	3.259**		
Culture	-.358 (.083)	-4.309***		
Culture * Evaluation of life events	.123 (.078)	1.581		
Culture * <i>n</i> Affiliation	-.033 (.049)	-.675		
Culture * Evaluation of life events * <i>n</i> Affiliation	.047 (.045)	1.032		
Life satisfaction (T1)	.567 (.037)	15.327***		
Age	-.035 (.025)	-1.433		
Sex	.132 (.080)	1.656(*)		

(\*)  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

contrast, findings mirror exactly the ones reported in Table 2 that were derived from analyses with the total sample.<sup>2</sup>

## 4 Discussion

In our longitudinal, cross-cultural study, we focused on the link between affective evaluations of social life events and life satisfaction in a sample of German and Zambian adolescents. The two samples, which represent an individualistic and a collectivistic cultural context (Hofer et al., 2021; Lehmann et al., 2021), were selected to test our assumption that regardless of participants' culture of origin, evaluations of social life events predict life satisfaction, particularly when individuals are characterized by a strong implicit affiliation motive.

<sup>2</sup> To examine the robustness of our findings, a number of additional analyses focusing on either model 1 or model 3, respectively, were performed. As 38 adolescents did not indicate the occurrence of a single life event, the analyses reported in text are based on data of 477 participants using, however, an index for motive strength (bias-free five picture set) derived from the total sample of 515 complete data sets of PSEs. In additional analyses, a mean score of three ("neither negative nor positive") was assigned to adolescents who did not indicate the occurrence of a single life event. This new variable was used as an alternative dependent variable in analyses. Furthermore, we reran all analyses with different indices for motive strength gained by a) the full six-picture set ( $n=515$ ), b) five-picture bias-free set ( $n=477$ ), and c) the full six-picture set ( $n=477$ ) as moderator. With respect to model 1 (culture used a covariate), subsequent analyses lead to findings that exactly mirror the ones reported in text. Similarly, findings are very much in line with results reported in text with respect to model 3 (culture as an additional moderator). Only two minor deviations are present: First, the marginally significant effect of sex becomes non-significant in analyses using the newly derived index for evaluations of life events as dependent variable and the index of motive strengths based on the 5-picture set ( $n=515$ ) ( $B=-.119$ ;  $SE=.076$ ;  $t=1.560$ ;  $p=.119$ ). Second, additional analyses using indices of motive strength based on the 6-picture sets based either on the total sample or on the subsample of 477 adolescents who reported at least one life event, point to marginally significant main effects of evaluations of life events on life satisfaction ( $Bs \leq .069$ ;  $SE=.039$ ;  $ts \leq 1.782$ ;  $ps \geq .075$ ). To conclude, additional analyses corroborate the findings that are reported in text.

Given the cross-cultural nature of our study, measurement equivalence was scrutinized in a first step of analyses. Due to well-established evidence on the applicability of the SWLS across highly diverse cultural samples, at least with respect to configural and metric invariances (e.g., Jang et al., 2017), we could refrain from in-depth bias analyses here. Moreover, a test of mean differences in life satisfaction between German and Zambian adolescents was not the focus of our study. Finally, measurement equivalence was not tested for evaluations of social life events that occur independently of each other. In contrast, item/picture bias was examined for the picture-set used to assess *n* Affiliation. Analyses indicated the presence of uniform and non-uniform bias for one picture cue, which consequently was not used when determining individuals' strength of *n* Affiliation (see, however, footnote 1 for additional analyses).

Life events can have effects on life satisfaction (e.g., Luhmann et al., 2012). Yet, bivariate correlations do not support our assumption on such a significant positive link between affective evaluations of social life events and life satisfaction. This lack of a direct link indicates that (single) life events might differ in their effects on life satisfaction and that these effects are not necessarily a function of the generally assigned desirability of events (e.g., Luhmann et al., 2012). Rather, additional factors might help to explain when life events unfold detrimental or beneficial effects on the individual's life satisfaction. For example, individuals' resources such as the quality of social (peer and parent) relationships might buffer negative and foster positive effects of (stressful) life events (e.g., McMahon et al., 2020). Moreover, personality dispositions might define (motivational) domains of responsiveness in which individuals are most likely to be affected by life events (Emmons, 1991). In the study at hand, we focused on such a personality component and examined in how far *n* Affiliation moderates effects of social life events on life satisfaction.

In line with our main hypothesis, analyses verified that evaluations of social life events predict life satisfaction at T2 only among adolescents characterized by a strong *n* Affiliation, that is, individuals who have a strong need to feel socially accepted and to have warm, secure relationships (Heyns et al., 1958). The more positively social life events were evaluated by adolescents high in *n* Affiliation the higher was their life satisfaction or, vice versa, lower levels of their life satisfaction were associated with negative evaluations of life events. Additional analyses verified that this effect of *n* Affiliation was not qualified by participants' culture of origin.

Extant evidence suggests that implicit motives moderate the well-established link between goal commitment, goal realization, and well-being: Successful realization of goals that are in line with one's implicit motives is related to enhanced well-being (e.g., Brunstein et al., 1998; Hofer et al., 2006). Hofer and Chasiotis (2003) showed that congruence between *n* Affiliation and self-attributed affiliation-oriented goals is associated with an enhanced life satisfaction among Zambian adolescents. However, there is also a dark side of *n* Affiliation: Motive frustration is linked to lower levels of well-being but also to conflict in intimate relationships (Mason & Blankenship, 1987), envy, and acts of indirect aggression (Hofer & Busch, 2011).

Our findings suggest that positively evaluated experiences and activities associated with social life events (e.g., positive changes in close friendships), allowed adolescents high in *n* Affiliation to consume positive affective rewards and thus achieve motive satisfaction as indicated by higher levels of life satisfaction. In contrast, a prevalence of negatively evaluated social life events (e.g., death of a close family member) results, due to its frustrating effect on *n* Affiliation, in lower levels of life satisfaction in adolescents high in *n* Affiliation. That is, specific life events increase or limit the options of an individual for motive-relevant affective experiences and behavior. For instance, getting to know new people by taking up

a new hobby allows the individual to satisfy their affiliation motive in an additional social context. On the other hand, losing contact with a friend because they moved away reduces the opportunity of engaging in affiliation-motivated behavior. Thus, *n* Affiliation can be an advantage or a vulnerability, depending on specific incentives or disincentives prevalent in a situation (Schultheiss & Köllner, 2021). In the long run, life events might also be able to initiate changes in people's motives (cf. Baumann et al., 2005; Denzinger & Brandstätter, 2018) in that they change the individual's capacity for showing behaviors that allow motive satisfaction.

Next, we will briefly comment on a number of additional findings that became apparent while testing our hypotheses. As expected, indices of life satisfaction at both measurement occasions were positively correlated to each other. Bivariate correlations indicate weak but significant associations between life satisfaction and a) *n* Affiliation and b) both adolescents' age and sex in the total sample; however, associations did not reach level of significance in regression analyses when effects of additional psychological variables on life satisfaction were considered in the model. Thus, these relationships ought not to be overrated. Furthermore, we will not discuss the difference between cultural samples in life satisfaction (see Table 3) as we did not test for scalar invariance in bias analyses that would allow meaningful comparisons of means between cultural samples (see Van de Vijver & Leung, 1997). Finally, the gender difference in *n* Affiliation nicely mirrors meta-analytical findings that women score higher in the implicit affiliation motive compared to men (Drescher & Schultheiss, 2016).

#### 4.1 Limitations and Outlook

Our findings add to the literature on the significant role of implicit motives for individuals' behavioral and psychological processes. However, some limitations have to be acknowledged. Although our study implemented a longitudinal design, evaluations of life events that have happened since T1 and the second report on life satisfaction were assessed simultaneously at the second measurement occasion. It might be that happier adolescents rated past life events as less stressful. Thus, future studies ought to implement an additional measurement occasion to separate the assessments of evaluations of life events and resulting effects on life satisfaction. Future studies might also examine in more detail in how far individuals' implicit motives predict the occurrence of particular life events longitudinally. Although our findings did not indicate such a relationship, life events can either occur to the passive individual but also be the result of the active individual's own motive-related behavior (e.g., approaching or avoiding motive-relevant contexts).

Moreover, the list of life events ought to be inspected to add additional life events relevant for the satisfaction and frustration, respectively, of *n* Affiliation. As it is, the list of social life events also included some that might be more relevant for older than for younger adolescents, particularly those referring to romantic relationships. However, as the evaluations of social life events score was computed only with those events a participant had actually experienced between T1 and T2, it would not affect their average evaluation score if younger adolescents had a lower probability of affirming relationship-related life events. Additional refinements of this mean evaluation of social life events score might include a weighing index for each life events. For instance, an event might elicit a strong negative emotional reaction, but affect daily routines only little (e.g., death of an emotionally close family member who had been seen only rarely, for example, because they lived far away). Another event might yield a comparably strong

emotional reaction and have a strong impact on day-to-day behavior (e.g., a friend the participant used to hang around with in school every day has moved to a different town). As it is, our evaluations of social life events scale cannot differentiate between these cases but gives an overall evaluation on whether life circumstances in the social domain have changed for the better or for the worse.

Future research also might add additional constructs that possibly moderate effects of life events on life satisfaction such as personality dispositions (e.g., traits and self-regulatory capacities) as well as social resources (e.g., peer support). When focusing on affiliation-oriented issues, future studies might also emphasize the assessment of hope and avoidance components of *n* Affiliation. Past research has shown that both facets of *n* Affiliation can have different effects on individuals' behavioral and psychological processes (e.g., Hofer & Busch, 2011).

Given the moderate Cronbach's alpha of the SWLS, at least in the Zambian subsample, a different instrument to assess adolescents' life satisfaction ought to be used in future studies (e.g., Gilman & Huebner, 2003). Moreover, additional indicators of well-being might be added to future studies. Although Luhmann et al. (2012) found life events to particularly influence life satisfaction, the moderating role of implicit motives also might be found for the link between life events and domain-specific indicators of well-being, such as, for example, loneliness for the social domain. With respect to our study design, mode of data collection differed between cultural samples at the second measurement occasion: Whereas Zambian took the questionnaire at school premises; German adolescents took an online format of the instruments. Although school authorities in Germany asked for this change and we do not think that this shift biased our findings, future studies ought to implement equivalent modes of data assessment in samples at hand. Finally, even if the findings at hand can be considered a first hint at universal relationships between psychological constructs at hand, it is essential to include a broader range of cultural contexts and age groups in future research.

To conclude, our findings indicate that implicit motives assign special meaning to life events with respect to available (dis)incentives indicating motive satisfaction and frustration, respectively. In doing so, however, *n* Affiliation does not relate to the (affective) evaluation of events but affects longitudinal consequences for self-reported life satisfaction. In contrast, the prevalence of social life events and their affective evaluations seems to neither increase nor decrease the life satisfaction of adolescents with a low strength of *n* Affiliation. Thus, our findings contribute to the growing evidence that implicit motives add to our understanding of human psychological and behavioral processes across cultural contexts.

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**Data availability** Data are available: at <http://www.osf.io/qph8c>.

## Declarations

**Conflict of interest:** The authors have no relevant financial or non-financial interests to disclose.

**Ethical standard** The Research Ethics Committee of the University of Zambia and the local school authority (ADD) in Rhineland Palatinate (Germany) approved the study. Moreover, administrators of secondary schools and parents were informed about the study.

**Informed consent:** Parents of younger adolescents were asked for permission and prior to data assessments, participants signed an informed consent form. Adolescents voluntarily participated in the study and were guaranteed that any information given would be treated confidentially and anonymously.

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