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Reducing discrepancies between actual and ideal affect across adulthood: the roles of activity flow conduciveness, pleasantness, and familiarity

Da Jiang[a]*, Dwight C. K. Tse[b,c]*, Xianmin Gong[d,e], Vivian H. L. Tsang[e,f], Helene H. Fung[e], Ajit S. Mann[g], Jeanne Nakamura[h] and Jeanne L. Tsai[i]

[a]Department of Special Education and Counselling, The Education University of Hong Kong, Tai Po, New Territories, Hong Kong, Hong Kong; [b]Department of Psychological Sciences and Health, University of Strathclyde, Glasgow, Scotland, United Kingdom; [c]Quality of Life Research Center, Claremont, CA, USA; [d]Stanley Ho Big Data Decision Analytics Research Centre, Chinese University of Hong Kong, Shatin, New Territories, Hong Kong, Hong Kong; [e]Department of Psychology, Chinese University of Hong Kong, Shatin, New Territories, Hong Kong, Hong Kong; [f]School of Arts and Social Sciences, Hong Kong Metropolitan University, Ho Man Tin, Kowloon, Hong Kong, Hong Kong; [g]Department of Psychology, Claremont Graduate University, Claremont, CA, United States; [h]Quality of Life Research Center, Department of Psychology, Claremont Graduate University, Claremont, CA, United States; [i]Department of Psychology, Stanford University, Stanford, CA, United States

ABSTRACT

Previous findings demonstrate that people often do not feel how they want to feel, supporting the distinction between "actual affect" and "ideal affect." But are there certain activities that reduce the discrepancy between actual and ideal affect? Based on flow theory and socioemotional selectivity theory, we examined whether the discrepancy between people's actual and ideal positive affect would be smaller during activities that were more conducive to flow (a state of intense absorption and concentration), pleasant, and familiar. In Study 1, U.S. participants aged 17–79 ($N = 393$) reported their ideal affect and how they felt during activities with varying degrees of challenges and skills. For both low-arousal positive affect (LAP) and high-arousal positive affect (HAP), participants reported smaller actual-ideal affect discrepancies during flow-conducive activities (when skills matched challenges). Study 2 was a 14-day experience sampling study, in which Hong Kong participants aged 18–83 ($N_{individual} = 109$) reported their momentary actual and ideal affect, and how pleasant and familiar their activities were ($N_{experience} = 3{,}815$). Greater activity familiarity was associated with smaller discrepancies in actual-ideal LAP, while greater activity pleasantness was associated with smaller discrepancies in actual-ideal HAP. These findings provide insights on the activities that help people achieve their ideal affect more easily.

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On average, most people feel less positive and more negative than they ideally want to feel (Sims et al., 2015; Tsai, 2007; Tsai et al., 2006). In other words, people's actual affect (how they actually feel) usually differs from their ideal affect (how they ideally want to feel). This is noteworthy because smaller discrepancies between actual and ideal affect are associated with better physical and mental health (Scheibe et al., 2013;

CONTACT Helene H. Fung hhlfung@psy.cuhk.edu.hk Department of Psychology, The Chinese University of Hong Kong, Room 328 Sino Building, Chung Chi College, Shatin, New Territories, Hong Kong, China
*The first two authors share the first authorship with equal contributions to this article.
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Tsai et al., 2006). What can people do to more closely align their actual affect with their ideal affect? One way of answering this question is by identifying the conditions under which people's actual and ideal affect are more similar to each other in daily life. In a previous study, participants experienced more enjoyment when they were engaged in an activity whose affective properties matched their ideal affect (e.g. the more people valued calm, the more they enjoyed low intensity exercise; Chim et al., 2018). In this paper, we examined whether there were other types of activities that might produce greater alignment between actual and ideal affect, based on flow (Study 1) and socioemotional selectivity (Study 2) theories. Ultimately, this work should help individuals select activities that improve their well-being.

The relationship between ideal affect and actual affect

Past studies have shown that across different cultures (e.g. European American vs. Chinese cultures), ideal affect has a weak to moderate correlation with actual affect, suggesting that the two constructs are independent and do not always correspond to each other (e.g. Tsai et al., 2006, 2007). According to affect valuation theory, individuals strive to reduce the discrepancy between their actual and ideal affect by engaging in various mood-producing behaviours (Chim et al., 2018; Tsai, 2007). For example, individuals who were primed to value low arousal positive states (LAP) experienced more positive emotions during low-intensity exercise than did those in the control group (Chim et al., 2018). Similarly in an experience sampling study, Lind and Isaacowitz (2019) found that adults of different ages selected their daily activities to regulate emotion, highlighting their efforts to realise ideal affect in everyday life. Specifically, older adults selected positive-deactivated activities (e.g. leisure reading), whereas middle-aged adults preferred positive-activated activities (e.g. exercising), supporting the age-differences in ideal affect (Scheibe et al., 2013). However, some activities may be more conducive to attaining specific ideal affective states than others. We sought to identify the types of activities that might facilitate greater alignment with one's ideal affect. In addition to affect valuation theory, our studies were guided by two conceptual models: flow theory (Csikszentmihalyi, 1990) and socioemotional selectivity theory (Carstensen et al., 2003).

Flow theory and flow conduciveness

According to flow theory, people achieve an optimal ("flow") experience during an activity when the perceived challenge level of the activity matches their skill level, resulting in intense absorption and concentration (Csikszentmihalyi, 1990). Past research has consistently revealed that people experience the greatest positive affect (both high and low arousal) when their skills are equal to the challenge at hand (Fong et al., 2015). These flow-conducive experiences include both high arousal activities (e.g. surfing [Macbeth, 1988], riding a motorcycle [Sato, 1988, 1991], soccer, swimming, triathlons [Jackson et al., 2001; Jackson & Eklund, 2002]) as well as low arousal activities (e.g. listening to sacred Shinto music and dancing [Sako, 2003], writing [Larson, 1988], and religious practices [Delle Fave et al., 2011]). In contrast, when people are engaged in tasks that are more challenging than their skills, they experience anxiety, and when people are engaged in tasks that are less challenging than their skills, they experience boredom (Csikszentmihalyi, 1990).

One area that remains unexplored is the interaction between flow conduciveness (challenge-skill balance) and ideal affect; that is, whether people who value LAP (or HAP) states more (vs. less) indeed experience more LAP (or HAP) states during flow conducive activities. Studies of how person-situation fit affects the flow state provide preliminary support (Keller & Blomann, 2008). For example, Liu and Csikszentmihalyi (2020) revealed that people high (vs. low) in extraversion tended to experience more frequent and intense flow state during social activities, suggesting that activities are more conducive to flow when their characteristics match with the person's dispositions. Furthermore, extraversion is significantly (albeit weakly) associated with greater ideal HAP but lower ideal LAP (Tsai et al., 2006), and social (vs. solitary) activities are associated with more intense actual HAP and less intense actual LAP (Pauly et al., 2017). Accordingly, we hypothesise that the discrepancy between individuals' actual and ideal affect would be smaller when they engage in flow-conducive (challenge – skill balanced) activities than non-flow-conducive activities.

Socioemotional selectivity theory, and activity pleasantness and familiarity

According to socioemotional selectivity theory (Carstensen et al., 2003), individuals differ in their goals depending on their perceptions of future time, with individuals prioritising emotionally meaningful (vs. knowledge) goals the more they perceive time as limited (e.g., older adults). Moreover, such individual differences in social goals are reflected in people's preferences for social partners and activities (Fung et al., 1999). Research suggests that individuals are more likely to achieve emotionally meaningful goals when they are engaged in more positive and familiar activities (Charles et al., 2003; Dudley & Multhaup, 2005; Fredrickson & Carstensen, 1990; Fung et al., 2001). For instance, individuals who prioritise emotionally meaningful goals over knowledge goals are more likely to engage in activities that elicit more positive emotions and to spend more time with familiar social partners (e.g. immediate family members) than novel social partners (e.g. recent acquaintances; Fredrickson & Carstensen, 1990; Fung et al., 2001; Seaman et al., 2016). In addition, interacting with familiar social partners is associated with more positive and less negative emotions (Vittengl & Holt, 1998; Vogel et al., 2017). Importantly, previous studies found that pleasant experiences were associated with both actual HAP and LAP states (Di Muro & Murray, 2012). However, actual HAP states were associated with more novel (less familiar) experiences (Rank et al., 2004), whereas actual LAP states were associated with more familiar tasks (Aron et al., 2000).

Although pleasantness and familiarity of an activity may facilitate achieving emotionally meaningful goals (Carstensen et al., 1999, 2003), little is known about whether engaging in more pleasant and/or familiar activities is more likely to reduce the discrepancy between actual and ideal affect. Based on the previous findings on the relationship between pleasantness, familiarity, and actual HAP and LAP states, we hypothesised that people would have smaller discrepancies in their actual and ideal LAP states during more familiar activities. We did not predict this for HAP states because LAP states are more consistently associated with familiarity than HAP states are. We also predicted that people would have smaller actual-ideal discrepancies in both LAP and HAP during more pleasant activities. Moreover, because older adults tend to prioritise emotionally meaningful goals more than younger adults (Carstensen et al., 2003), we hypothesised that the moderating effect of pleasantness and familiarity on the actual-ideal affect discrepancy would be stronger among older than younger adults.

The present studies

We investigated whether three activity characteristics – flow conduciveness, pleasantness, and familiarity – would be associated with the discrepancy between actual and ideal affect (specifically, LAP and HAP affect (Neubauer et al., 2020)).[1] In Study 1, we examined the role of flow conduciveness using a retrospective design in which we manipulated the challenge – skill balance of recall prompts. In Study 2, we examined the roles of pleasantness and familiarity using an experience sampling design.

Study 1 materials and methods

In Study 1, we hypothesised that the discrepancy between actual and ideal affect would be smaller when individuals engage in flow-conducive (operationalised in this study as challenge – skill balanced) activities than non-flow-conducive activities (H1). Given that flow theory underscores the universality of flow experiences across age groups (Csikszentmihalyi, 1990; Tse et al., 2020), we did not hypothesise significant differences in the effect of flow conduciveness across age.

Participants

The participants were 406 adults (53.7% female; $M_{\text{age}} = 40.46$, $SD = 14.87$, age range = 19–79 years) recruited via Amazon Mechanical Turk (mTurk). Because typical mTurk samples over-represent younger adults, we over-sampled adults aged 60 years or above using a quota system to ensure a more equally distributed representation of participants across adulthood. Based on simulation-based post-hoc multilevel power analyses (Bulus et al., 2021), the sample size was large enough to detect a cross-level interaction equivalent to an effect size of $d = 0.21$, 0.25, and 0.28 with statistical power = .80, .90, and .95, respectively, assuming $\alpha = .05$ with multilevel modelling (intraclass correlation [ICC] for actual-ideal LAP and HAP discrepancies = .18 and .25, respectively). All participants self-reported being U.S. residents and proficient in English. The ethnic composition of the sample was as follows: 78.6% Caucasian, 2.0% Native American, 6.9% Asian American or Pacific Islander, 5.2% Hispanic/Latino, and 7.3% "other." Table 1 shows the descriptive statistics of the sample.

Procedure

Participants first reported their demographic information (e.g. age, gender) and their ideal affect. Then, they were prompted to recall activities that they chose to do (i.e. voluntary activities) in which (a) "the level of challenge in this activity was *way*

Table 1. Descriptive information on the main variables and demographic information.

Variable	Study 1 *M*/%	Study 1 *SD*	Study 2 *M*/%	Study 2 *SD*
Actual LAP	2.93	1.21	2.86	0.92
Actual HAP	2.81	1.13	2.61	0.90
Ideal LAP	4.13	0.76	3.05	0.98
Ideal HAP	3.49	0.81	2.93	0.96
Familiarity	–	–	6.34	1.13
Pleasantness	–	–	5.16	1.45
Age	40.46	14.87	45.69	21.40
Education (% college or above)	49.8%		31.2%	
Subjective health	3.41	0.96	3.95	1.38
Gender (% female)	53.7%		54.1%	
Race (% Caucasian)	78.6%		–	
Work status (% full-time worker)	56.2%		23.9%	

Notes: $N_{\text{Study 1}}$ = 393. $N_{\text{Study 2}}$ = 109. LA*P* = low-arousal positive affect; HA*P* = high-arousal positive affect; Gender: 0 = male; 1 = female; Education level: 0 = high school or below, 1 = college or above; Subjective health: a higher score indicates a better subjective physical health condition.

above [their] current skill level" (overchallenging activity; e.g. philosophical discussion in a foreign language), (b) "the level of challenge in this activity was *just right* for [their] skill level, neither too high nor too low" (balanced activity; e.g. golfing), or (c) "the level of challenge in this activity was *way below* [their] current skill level" (underchallenging activity; e.g. cleaning the house; examples were provided by participants). The overchallenging, balanced, and underchallenging activities correspond to the anxiety, flow, and boredom conditions postulated in the original flow model (Csikszentmihalyi, 1975). The order in which participants recalled these three activities was counterbalanced to eliminate order effects. Finally, participants rated their flow experience and positive affect for each of the self-identified activities. The total number of observations was 1,218 (each participant contributed three measurements).

Measures

Challenge, skill, and flow experience

The perceived level of challenge posed by and skill required for the self-identified activities were measured using the items "How challenged/skilled did you typically feel when you were doing this activity?" on a 7-point Likert scale from *1* (*not at all*) to *7* (*extremely*). Challenge – skill difference was computed by substracting the rating of perceived skill from that of perceived challenge. Flow experience for each self-identified activity was measured using the Short Dispositional Flow Scale (Jackson et al., 2008). This scale includes nine items that correspond to each of the nine dimensions of dispositional flow described by Csikszentmihalyi (1990). A sample item is "I was completely focused on the task at hand." Participants responded on a 5-point Likert scale indicating the extent to which they agreed with each statement, ranging from 1 (*totally disagree*) to 5 (*totally agree*). Internal consistency was adequate (αs = .80, .83, and .82 for overchallenging, balanced, and underchallenging activities, respectively).

Actual affect

Actual affect for each self-identified activity was measured using the Affect Valuation Index (AVI; Tsai et al., 2006). Respondents rated on a 5-point Likert scale from 1 (*never*) to 5 (*all of the time*) the extent to which they "*actually* felt" a particular affective state when doing the self-identified activity. The original scale includes 30 distinct affective states that represent the octants of the affective circumplex (Russell, 1980). As this study focused on positive affect and flow experiences that are not typically associated with negative affect (e.g. Baker et al., 2005; Cseh et al., 2015), we included only the scale's five LAP state items (e.g. "calm") and five HAP state items (e.g. "excited") in the survey. The internal consistency for the actual LAP and HAP affect items was adequate (αs > .85) in each of the three self-identified activities.

Ideal affect

Ideal affect was also measured using the AVI. Respondents rated on a 5-point Likert scale from 1 (*never*) to 5 (*all of the time*) to indicate the extent to which they "*ideally* liked to feel" a particular affective state over the course of a typical week. The abovementioned items from the actual affect measure were used again. Internal consistency was adequate (αs = .91 for LAP and .83 for HAP).

Demographics

Participants reported their age, gender (0 = *female*, 1 = *male*), ethnicity (0 = *non-Caucasian*, 1 = *Caucasian*), highest level of education obtained (1 = *elementary school*, 8 = *doctoral degree*), work status (0 = *non-full-time worker*, 1 = *full-time worker*), and subjective health condition (1 = *poor*, 5 = *excellent*).

Analytical model

Two of the authors (DT and AM) independently screened the descriptions of the self-identified activities. There were 8.7% (*k* = 106 activities) invalid responses that we were unable to classify (e.g. "just live life"). Two participants did not report any valid activity and 11 reported only one valid activity. We removed these participants from the dataset because we were unable to perform meaningful within-person comparisons of their valid self-identified activities. The final sample comprised 393 participants who gave at least two valid responses. We first calculated the *actual-ideal discrepancy* in LAP and HAP states by subtracting ideal LAP (or HAP) from actual LAP (or HAP) states (discrepancy = actual − ideal), a score closer to zero indicating closer fit (i.e. a smaller actual-ideal discrepancy).[2] Given the multilevel data structure (Level 1: self-nominated activity, Level 2: participant), we conducted multilevel modelling to perform manipulation checks and test the hypotheses. In all multilevel models, we dummy-coded challenge-skill balanced activities to be the reference group. Given that age may have differential effects on actual HAP and LAP states (Diener et al., 1999), we included both linear and quadratic age terms (grand-mean centred and divided by 10 for the ease of interpretation) as predictors to capture both linear and non-linear age effects. We also included other demographics as covariates. Finally, we grand-mean-centred all predictors, following Hayes (2006) procedure.

This study was not preregistered. Data, codebook, and syntax are publicly available at https://osf.io/9wub7/.

Study 1 results and discussion

Manipulation check

We conducted a manipulation check to ensure that participants had reported activities with different challenge-skill levels corresponding to the challenge-skill prompts. First, we used multilevel modelling to compare challenge-skill difference scores (challenge − skill) across the three self-identified activities. The main effect of challenge-skill prompts was significant, $F(2, 1109) = 685.88$, $p < .001$, partial $\eta^2 = 0.55$. Pairwise comparisons showed that challenge-skill difference was the highest in overchallenging activities ($M = 3.28$, $SD = 2.14$), followed by balanced ($M = -0.79$, $SD = 1.92$, Cohen's $d = 2.00$) and underchallenging activities ($M = -2.60$, $SD = 2.55$, $d = 2.50$; all pairwise comparisons' $ps < .001$). In addition, we conducted multilevel modelling to compare participants' flow state scores across the three activities. The main effect of challenge-skill condition was significant, $F(2, 740) = 276.60$, $p < .001$, partial $\eta^2 = 0.43$. Pairwise comparisons showed that participants' reported flow states were the highest in balanced activities ($M = 5.59$, $SD = 0.91$), followed by underchallenging ($M = 5.13$, $SD = 1.05$, $d = 0.47$) and overchallenging activities ($M = 4.09$, $SD = 1.14$, $d = 1.45$; all pairwise comparisons' $ps < .001$). Consistent with flow theory, challenge-skill balanced activities were the most flow-conducive among the three activities that participants were prompted to recall.

Actual-ideal affect discrepancy

Actual and ideal LAP

We used a multilevel model with actual-ideal LAP affect discrepancy scores predicted by flow-conducive activities, age, and their interactions (see Table 2). The main effect of flow-conducive activities was significant, $F(2, 732) = 257.34$, $p < .001$, partial $\eta^2 = 0.41$. Moreover, the two-way interactions between flow-conducive activities and age were not significant, for linear age, $F(2, 734) = 1.47$, $p = .230$, partial $\eta^2 = 0.00$; for quadratic age, $F(2, 730) = 0.67$, $p = .513$, partial $\eta^2 = 0.00$. Consistent with H1, pairwise comparison analyses revealed that the actual-ideal LAP affect discrepancy was the smallest in balanced activities ($M = -0.67$, 95% CI [−0.78, −0.55]), followed by underchallenging activities ($M = -0.88$, 95% CI [−0.99, −0.76], $p = .002$, Cohen's $d = 0.09$) and overchallenging activities ($M = -2.10$, 95% CI [−2.22, −1.99], $p < .001$, $d = 0.63$).

Actual and ideal HAP

We then ran a similar multilevel model with actual-ideal HAP affect discrepancy scores predicted by flow-conducive activities, age, and their interactions (see Table 2). The main effect of flow-conducive activities was again significant $F(2, 732) = 214.59$, $p < .001$, partial $\eta^2 = 0.37$. Moreover, the two-way interactions between flow-conducive activities and age were not significant, for linear age, $F(2, 733) = 1.13$, $p = .322$, partial $\eta^2 = 0.00$; for quadratic age, $F(2, 729) = 0.05$, $p = .952$, partial $\eta^2 = 0.00$. Also consistent with H1, pairwise comparison analyses revealed that the actual-ideal HAP affect discrepancy was the smallest in balanced activities ($M = 0.02$, 95% CI [−0.09, 0.13]), followed by underchallenging activities ($M = -0.97$, 95% *CI* [−1.07, −0.86], $p < .001$, Cohen's $d = 0.46$) and overchallenging activities ($M = -1.14$, 95% *CI* [−1.25, −1.04], $p < .001$, $d = 0.54$).

The findings suggest that as hypothesised (H1), when individuals were engaged in challenge-skill balanced activities, they were not only more likely to experience flow, but they also experienced the

Table 2. Coefficients from the multilevel analysis on actual – ideal affect discrepancies in study 1.

	Actual – ideal LAP discrepancy					Actual – ideal HAP discrepancy				
Variable	*b*	*SE*	*p*	*LLCI*	*ULCI*	*b*	*SE*	*p*	*LLCI*	*ULCI*
Gender (female)	0.27	0.09	.003	0.09	0.45	0.12	0.09	.164	−0.05	0.29
Race (Caucasian)	−0.22	0.11	.042	−0.44	−0.01	−0.12	0.11	.238	−0.33	0.08
Work Status (Full-time worker)	0.15	0.10	.112	−0.04	0.34	0.15	0.09	.098	−0.03	0.34
Education	−0.03	0.03	.347	−0.09	0.03	0.02	0.03	.571	−0.04	0.08
Subjective health	0.02	0.05	.640	−0.07	0.11	0.01	0.05	.908	−0.08	0.09
Age	−0.04	0.06	.504	−0.15	0.07	0.01	0.05	.805	−0.09	0.11
Quadratic age	0.06	0.03	.043	0.00	0.13	0.05	0.03	.096	−0.01	0.11
Overchallenging activities	−1.44	0.07	<.001	−1.57	−1.30	−1.16	0.06	<.001	−1.28	−1.04
Underchallenging activities	−0.21	0.07	.002	−0.34	−0.08	−0.98	0.06	<.001	−1.10	−0.86
Age × Overchallenging activities	−0.10	0.06	.131	−0.22	0.03	−0.08	0.06	.140	−0.19	0.03
Age × Underchallenging activities	0.00	0.06	.959	−0.13	0.12	−0.06	0.06	.322	−0.17	0.05
Quadratic age × Overchallenging activities	0.00	0.04	.972	−0.07	0.07	−0.01	0.03	.797	−0.07	0.05
Quadratic age × Underchallenging activities	−0.03	0.04	.328	−0.11	0.04	0.00	0.03	.981	−0.06	0.06

Notes: $N = 393$; $k = 1.179$. All coefficients were unstandardised. Age and quadratic age were divided by 10 for easier interpretations. Challenge-skill balanced activities were the reference group. Because actual affect tended to be lower than ideal affect in most cases, a negative effect would mean a larger discrepancy between actual and ideal affect. LAP = low-arousal positive affect; HAP = high-arousal positive affect.

smallest actual-ideal LAP and HAP affect discrepancies. That is, challenge-skill balanced activities increase the likelihood that people will experience their ideal affect (Csikszentmihalyi, 1990; see Figure 1 that shows the actual LAP and HAP levels in the three activities, broken down by various levels of ideal LAP and HAP states).

Given that flow theory posits the generalizability of flow experiences across age groups (Csikszentmihalyi, 1990), it is perhaps not surprising that we found no significant moderating effects of age in Study 1. Our findings are also consistent with studies that suggest that people tend to reengage in their preferred flow-conducive activities because they are intrinsically rewarding (Rathunde & Csikszentmihalyi, 2007; Tse et al., 2020, 2022). In sum, as predicted, the actual-ideal affect discrepancy was smaller in flow-conducive activities. In Study 2, we examined the effects of pleasantness and familiarity on actual-ideal affect discrepancies.

Study 2 materials and methods

We examined momentary ideal affect, actual affect, and activities five times per day for seven days using a time-lagged analysis. The use of a time-lagged rather than concurrent analysis was based on the assumption that awareness of one's ideal affect would motivate subsequent actions to attain it, and the effects of any behaviour on actual affect would likely be observed at the next time point as opposed to the current one (Chim et al., 2018; Tsai, 2007). In other words, we expected certain activities to increase the alignment between how people wanted to feel at a given moment and how they actually felt at a later moment in time. Specifically, we hypothesised that activity pleasantness at time *t* would be positively associated with smaller discrepancies between ideal states at time *t-1* and actual states at time *t* (both LAP and HAP; **H2**). Moreover, we expected that activity familiarity would be positively associated with smaller discrepancies in actual-ideal LAP states, but not HAP states, because LAP states are more consistently associated with familiarity than are HAP states (**H3**). According to socioemotional selectivity theory (Carstensen et al., 2003), we hypothesised that the effect of pleasantness and familiarity on the actual-ideal affect discrepancy would be stronger among older than younger adults (**H4**), given that older (vs. younger) adults tend to have a more limited future time perspective and prioritise emotionally meaningful goals.

Participants

We recruited 109 Hong Kong Chinese (54.10% female; $M_{age} = 45.69$ years, $SD_{age} = 21.40$ years, ranging from 18 to 83 years old) participants (see Table 1). All participants were required to (1) be living in Hong Kong when the study was conducted; (2) have been raised in mainland China or Hong Kong; and (3) have parents who were born and raised in mainland China or Hong Kong. They were recruited from the community through convenience and snowball sampling and received HK$500 (approximately US $75) for participating in the study. To assess the sensitivity of our design and sample size in detecting the effects of interest in Study 2, we conducted sensitivity (post-hoc) power analyses based on estimated parameters. Results of the sensitivity analyses are

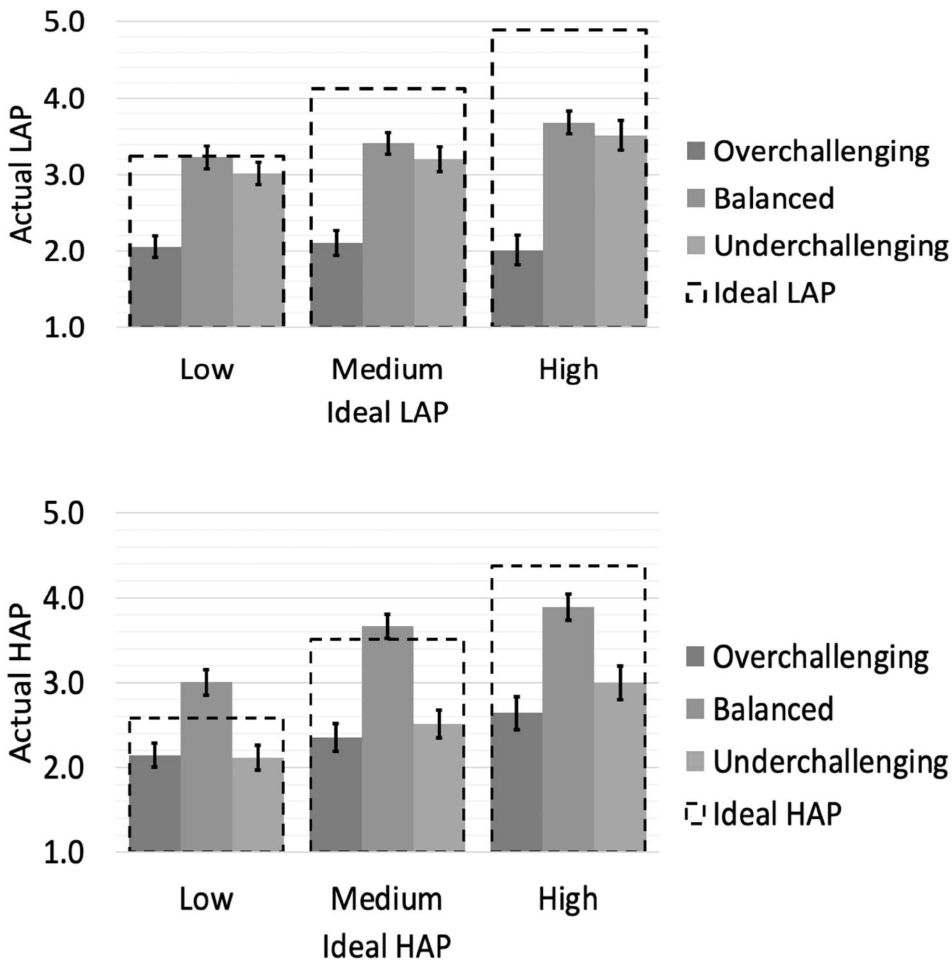

Figure 1. LAP = low arousal positive. HAP = high arousal positive. In Study 1, frequencies of actual LAP states (top) and HAP states (bottom) among low (1st tertile), medium (2nd tertile), and high (3rd tertile) ideal LAP or HAP groups, broken down by underchallenging, challenge-skill balanced, and overchallenging activities. Error bars represent 95% CIs. Dotted lines refer to the mean levels of ideal LAP/HAP states.

reported in the Supplementary Materials. As shown in Supplemental Table S3, with the sample size ($N = 109$) and the total number of experience sampling responses ($k = 3,815$), the model was able to achieve statistical power > .80 for effects of interest when assuming the size of the standardised coefficient *es* = .15 and power ≈ 1 when assuming *es* = .20.

Procedure

Before the study started, all participants were invited to the laboratory to complete a pretest survey regarding their demographics. Next, participants identified a 12-hour window in a day (e.g. 9 am to 9 pm) during which they wished to complete the experience-sampling surveys. They were randomly telephoned five times in the specified 12 hours for seven days (35 sampling surveys in total), with one hour as the minimum interval between the calls. During each call, they were asked about their momentary actual and ideal affect, and their activities at hand (see Measures). In addition to the measures included in the study, participants completed other measures out of the scope of this manuscript in the pretest survey and the sampling surveys. All participants completed 35 sampling surveys, and no participants dropped out from the study.

Measures

Momentary ideal and actual affect

We adopted the short version of the AVI (Tsai et al., 2006), in which HAP state was measured by "enthusiastic" and LAP state was measured by "calm." Using shorter scales and even single-item measures is common in intensive longitudinal designs such as experience sampling studies to avoid participant fatigue, given the repetitive nature of the study design (Mehl & Conner, 2012). Participants were asked to indicate the intensity of each state they ideally wanted to feel and were actually feeling (from 1 = *not at all* to 5 = *extremely*) when they were called. Previous research has demonstrated the significant correlation between the full and short versions of the AVI (Jiang et al., 2016).

Pleasantness and familiarity

Participants described the activity they were doing when they were called in terms of both its pleasantness ("*how pleasant is this activity?*") and familiarity ("*how familiar to you is this activity?*"). Participants used a 7-point Likert scale from 1 (*extremely unpleasant/unfamiliar*) to 7 (*extremely pleasant/familiar*).

Demographic information

In the initial survey, participants reported their demographic information, including age, gender (0 = *female*, 1 = *male*), their highest level of education obtained (*0 = high school or below, 1 = bachelor or above*), work status (0 = *non-full-time worker*, 1 = *full-time worker*), and subjective health condition, measured by asking the participants how often they experienced poor health (0 = *nearly every day*, 5 = *almost never*).

Analytical strategies

We first calculated the actual-ideal discrepancy in LAP ($dLAP_t$) and HAP states ($dHAP_t$) by subtracting ideal LAP/HAP at time point *t*-1 from actual LAP/HAP at *t* within the same day (namely $aLAP_t - iLAP_{t-1}$ and $aHAP_t - iHAP_{t-1}$), such that a higher score indicates a smaller actual-ideal discrepancy (or say, the ideal affect was better achieved). We thenexamined the correlation between actual-ideal affect discrepancy (dLAP and dHAP; see calculations below), ideal affect (iLAP and iHAP), and actual affect (aLAP and aHAP). As shown in Supplemental Table S2, affect discrepancy weakly correlated with ideal affect ($rs \leq .10$) and moderately corelated with actual affect ($rs \leq .51$). The results suggest that affect discrepancy was not solely determined by ideal affect or actual affect, and the associations between activity features and affect discrepancy were not fully driven by the variation in ideal affect or actual affect alone.

In our experience sampling design, each participant was tested multiple times, resulting in a two-level data structure (level 1: measurement point; level 2: person). ICCs were .50, .51, .43, .46, .18, and .28 for ideal LAP, ideal HAP, actual LAP, actual HAP, familiarity of activity, and pleasantness of activity, respectively. The ICCs showed that inter-person variation accounted for a substantial portion of the variance in the data, highlighting the necessity to consider the multilevel structure of the data during analyses. Thus, we performed dynamic structural equation modelling (DSEM; Asparouhov et al., 2018; Hamaker et al., 2021) with Mplus version 8.4 (Muthén & Muthén, 2017) to examine the relationships among ideal affect, pleasantness and familiarity of activities, and actual affect. DSEM can handle experience sampling data by integrating time series modelling, multilevel modelling, and structural equation modelling (Hamaker et al., 2021). It also provides a flexible approach to model varying time intervals between measurement points (see the Supplemental Materials for more information).

We conducted a DSEM analysis (see Figure 2) to examine (1) whether familiarity and pleasantness of activities were associated with the discrepancy between ideal affect and follow-up actual affect and (2) whether the associations varied with age. Note that the discrepancy between the actual affect at the first measurement of a day and the ideal affect at the last measurement of the previous day was not included and treated as a missing value (Myin-Germeys & Kuppens, 2022) because there was typically a longer time gap between the two measurement points, and there was not much activity during the night since most people were asleep. Then, these two actual-ideal discrepancy measures ($dLAP_t$, $dHAP_t$) and the measures of familiarity (FAM_t) and pleasantness (PLE_t) of activity at each time point were decomposed into a time-variant within-person component (indicated by the superscript $^{(w)}$) and a time-invariant between-person component (indicated by the superscript $^{(B)}$).

At the within-person level, $dLAP_t^{(w)}$ and $dHAP_t^{(w)}$ were regressed on $FAM_t^{(w)}$ and $PLE_t^{(w)}$ (the $\beta 1_{LAP}$, $\beta 2_{LAP}$, $\beta 1_{HAP}$, $\beta 2_{HAP}$ paths), with their autoregression effects being controlled for (the φ_{LAP} and φ_{HAP} paths). Modelling these effects allowed us to examine how participants' attainment of ideal affect (i.e. actual-ideal discrepancy in affect) was related to the features (familiarity and pleasantness) of concurrent activities. For model integrity, we also added

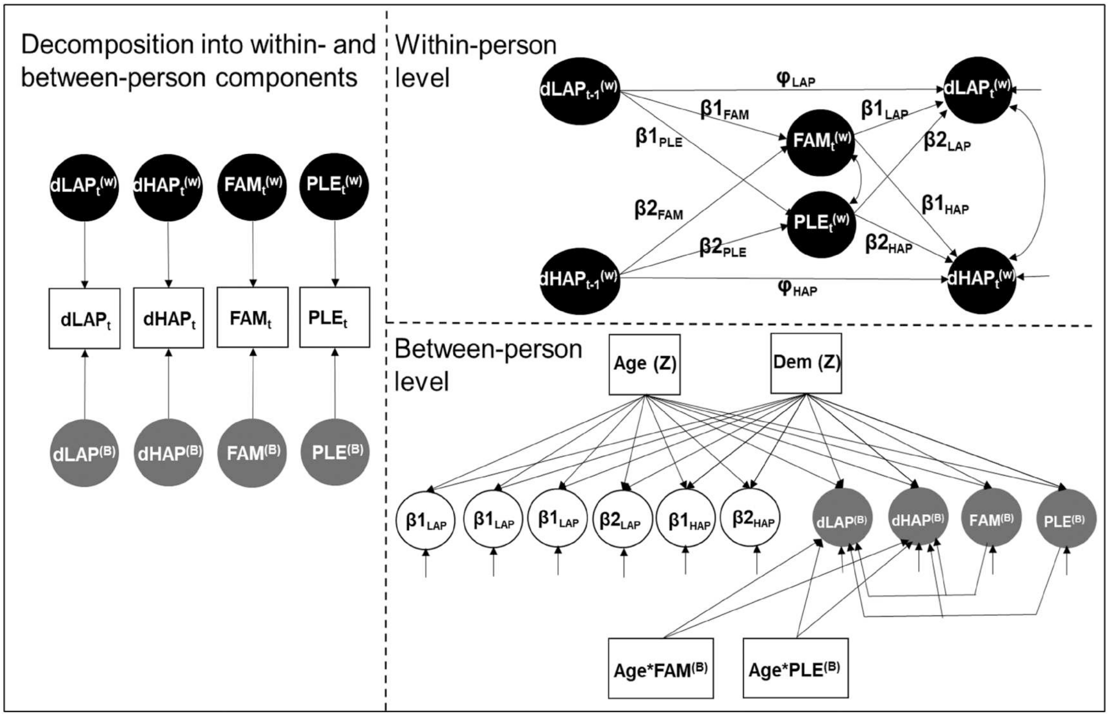

Figure 2. A dynamic structural equation model (DSEM) of the relationship between activity characteristics (familiarity and pleasantness) and the actual-ideal affect discrepancy in an adult sample. dLAP = the actual-ideal discrepancy in low-arousal positive affect; dHAP = the actual-ideal discrepancy in high-arousal positive affect; FAM = familiarity of activity; PLE = pleasantness of activity; the subscript $_t$ = time point *t*; the superscript $^{(W)}$ = within-person component, and $^{(B)}$ = between-person component; Dem = demographic variables (sex, education level, work status, and subjective health); Age and Dem were standardised (*Z* scores). Adding auto-regression paths for FAM and PLE, as well as time-lagged regression paths pointing from $dLAP^{(W)}_{t-1}$ and $dHAP^{(W)}_{t-1}$, does not change the pattern for effects of interest.

the regression paths pointing from $dLAP^{(w)}_{t-1}$ and $dHAP^{(w)}_{t-1}$ to $FAM^{(w)}_{t}$ and $PLE^{(w)}_{t}$.

At the between-person level, we examined whether age (standardised) significantly moderated the within-person prediction effects on affect discrepancy (i.e. the path coefficients $\beta1_{LAP}$, $\beta2_{LAP}$, $\beta1_{HAP}$, $\beta2_{HAP}$, φ_{LAP}, φ_{HAP}), after controlling for demographic covariates, including sex, work status, and subjective health (all demographic covariates were standardised; education level was excluded due to missing values and the absence of effects on activity features and affect measures). This allowed us to examine whether the within-person associations between activity and concurrent actual-ideal discrepancy in affect varied with age. We also examined whether age significantly predicted the time-invariant between-person components of affect and activity measures ($dLAP^{(B)}$, $dHAP^{(B)}$, $FAM^{(B)}$, $PLE^{(B)}$), as well as the age*$FAM^{(B)}$ and age*$PLE^{(B)}$ interaction effects on $dLAP^{(B)}$ and $dHAP^{(B)}$, which allowed us to examine the between-person associations between activity and actual-ideal discrepancy in affect across age.

This study was not preregistered. Data, codebook, and full results of all the analyses are publicly available at https://osf.io/9wub7/?view_only = 80d86d7b094f43bd8176705cdfa6ac6d.

Study 2 Results

Within-person analyses

Table 3 lists the standardised estimates of the fixed effects in the model (with goodness-of-fit indices DIC = 94537.59, pD = −15903.192). At the within-person level, $FAM^{(w)}_{t}$ was positively associated with $dLAP^{(w)}_{t}$, $\beta1_{LAP} = .04$, $p = .046$, 95% $CI = [.001, .08]$, and $PLE^{(w)}_{t}$ was positively associated with $dHAP^{(w)}_{t}$, $\beta2_{HAP} = .10$, $p < .001$, 95% $CI = [.06, .14]$. Consistent with H2, higher levels of activity familiarity were associated with smaller discrepancies between actual and ideal

Table 3. Standardised fixed effects of interest in the DSEM model of study 2.

Paths	Standardised coefficient	*p* value (two-tailed)	95% *CI*
Within-person main effects			
φ_{LAP}: $dLAP^{(w)}_{t-1} \rightarrow dLAP^{(w)}_{t}$	−.02	.392	[−.07, .03]
φ_{HAP}: $dHAP^{(w)}_{t-1} \rightarrow dHAP^{(w)}_{t}$	−.03	.160	[−.08, .01]
φ_{FAM}: $dFAM^{(w)}_{t-1} \rightarrow dFAM^{(w)}_{t}$	**.15**	**<.001**	**[.11, .18]**
φ_{PLE}: $dPLE^{(w)}_{t-1} \rightarrow dPLE^{(w)}_{t}$	**.15**	**<.001**	**[.11, .19]**
$\beta1_{LAP}$: $FAM^{(w)}_{t} \rightarrow dLAP^{(w)}_{t}$	**.04**	**.046**	**[.001, .08]**
$\beta2_{LAP}$: $PLE^{(w)}_{t} \rightarrow dLAP^{(w)}_{t}$	.02	.288	[−.02, .06]
$\beta1_{HAP}$: $FAM^{(w)}_{t} \rightarrow dHAP^{(w)}_{t}$	−.03	.248	[−.07, .02]
$\beta2_{HAP}$: $PLE^{(w)}_{t} \rightarrow dHAP^{(w)}_{t}$	**.10**	**< .001**	**[.06, .14]**
$\beta1_{FAM}$: $dLAP^{(w)}_{t-1} \rightarrow FAM^{(w)}_{t}$	−.04	.054	[−.08, .001]
$\beta2_{FAM}$: $dHAP^{(w)}_{t-1} \rightarrow FAM^{(w)}_{t}$	−.02	.322	[−.07, .03]
$\beta1_{PLE}$: $dLAP^{(w)}_{t-1} \rightarrow PLE^{(w)}_{t}$	.004	.880	[−.04, .05]
$\beta2_{PLE}$: $dHAP^{(w)}_{t-1} \rightarrow PLE^{(w)}_{t}$	.004	.882	[−.04, .04]
Cross-level interactions			
Age → φ_{LAP}: Age × $dLAP^{(w)}_{t-1} \rightarrow dLAP^{(w)}_{t}$	−.08	.362	[−.43, .18]
Age → φ_{HAP}: Age × $dHAP^{(w)}_{t-1} \rightarrow dHAP^{(w)}_{t}$	.09	.472	[−.17, .35]
Age → $\beta1_{LAP}$: Age × $FAM^{(w)}_{t} \rightarrow dLAP^{(w)}_{t}$	−.22	.300	[−.67, .19]
Age → $\beta2_{LAP}$: Age × $PLE^{(w)}_{t} \rightarrow dLAP^{(w)}_{t}$	.02	.908	[−.34, .42]
Age → $\beta1_{HAP}$: Age × $FAM^{(w)}_{t} \rightarrow dHAP^{(w)}_{t}$	**.36**	**.006**	**[.08, .71]**
Age → $\beta2_{HAP}$: Age × $PLE^{(w)}_{t} \rightarrow dHAP^{(w)}_{t}$	−.16	.150	[−.39, .06]
Between-person main effects			
Age → $FAM^{(B)}$	06	.476	[−.09, .20]
Age → $PLE^{(B)}$	**.31**	**<.001**	**[.18, .44]**
Age → $dLAP^{(B)}$	.01	.134	[−.15, .17]
Age → $dHAP^{(B)}$	**.39**	**< .001**	**[.24, .54]**
$FAM^{(B)} \rightarrow dLAP^{(B)}$	**.26**	**.026**	**[.06, .48]**
$FAM^{(B)} \rightarrow dHAP^{(B)}$	.15	.194	[−.07, .37]
$PLE^{(B)} \rightarrow dLAP^{(B)}$	.21	.104	[−.05, .44]
$PLE^{(B)} \rightarrow dHAP^{(B)}$	.19	.106	[−.05, .40]
Between-person interactions			
Age × $FAM^{(B)} \rightarrow dLAP^{(B)}$	−.12	.094	[−.26, .02]
Age × $FAM^{(B)} \rightarrow dHAP^{(B)}$	−.06	.398	[−.19, .07]
Age × $PLE^{(B)} \rightarrow dLAP^{(B)}$	−.03	.674	[−.18, .11]
Age × $PLE^{(B)} \rightarrow dHAP^{(B)}$	**−.20**	**.002**	**[−.32, −.06]**

Note: dLAP = the actual-ideal discrepancy in low-arousal positive affect; dHAP = the actual-ideal discrepancy in high-arousal positive affect; FAM = familiarity of activity; PLE = pleasantness of activity; the subscript $_t$ = timepoint *t*; the superscript $^{(W)}$ = within-person component, and $^{(B)}$ = between-person component. Demographic variables (sex, work status, and subjective health) were controlled for as covariates. Age and all covariates were standardised (*Z* scores). Significant effects are highlighted in bold.

LAP (i.e. better attainment of ideal LAP). For H3, however, while higher levels of activity pleasantness were associated with better attainment of ideal HAP, they were not associated with actual-ideal LAP discrepancy ($p = .288$). Contrary to H5, however, none of the within-person associations were significantly moderated by age.

Between-person analyses

At the between-person level, age was positively associated with $PLE^{(B)}$, estimated coefficient = .31, $p < .001$, 95% *CI* = [.18, .44], and $dHAP^{(B)}$, estimated coefficient = .39, $p < .001$, 95% *CI* = [.24, .54]. These results indicate that older participants reported higher levels of activity pleasantness and smaller actual-ideal discrepancies in HAP. $FAM^{(B)}$ was positively associated with $dLAP^{(B)}$, estimated coefficient = .26, $p = .026$, 95% *CI* = [.06, .48], indicating that engagement in familiar activities was associated with smaller discrepancies in LAP at the between-person level. There was also a significant age × $PLE^{(B)}$ interaction effect on $dHAP^{(B)}$, estimated coefficient = -.21, $p = .002$, 95% *CI* = [–.32, −.06]. To reveal how age interacted with $PLE^{(B)}$, we performed a simple slope analysis to exclusively focus on the age × person-mean PLE interaction effect on person-mean dHAP (note that $PLE^{(B)}$ and $dHAP^{(B)}$ are essentially the person means of PLE and dHAP, respectively), controlling for demographic covariates. The result showed a stronger positive association between $PLE^{(B)}$ and $dHAP^{(B)}$ when age was lower (lower age: $b = .64$, $SE = .03$, $p < .001$; higher age: $b = .30$, $SE = .01$, $p < .001$), suggesting that for younger (vs. older) adults, a higher personal average of activity pleasantness was more strongly associated with greater attainment of ideal HAP states on average.

General discussion

When does people's actual affect align with their ideal affect? In two studies, we examined whether the discrepancy between actual and ideal affect was smaller during activities that were more flow-conducive, pleasant, and familiar. In Study 1, using a retrospective design with manipulations of recall prompts based on levels of challenge and skill, we found that as predicted (H1), for both HAP and LAP states, the actual-ideal affect discrepancy was smaller during flow-conducive (challenge – skill balanced) activities than non-flow-conducive activities. In Study 2, we found that when people were engaged in activities that were more familiar, they experienced smaller actual-ideal LAP discrepancies (consistent with H2), and when people were engaged in activities that were more pleasant, they experienced smaller actual-ideal HAP discrepancies (partially supporting H3). These findings provide the first evidence that the discrepancy between actual and ideal affect may depend on the characteristics of the activities people are engaged in.

Although ideal affect represents the affective states that people desire to experience, their actual affective experiences may not align with their preferences due to realistic constraints. The ability to find a context that matches with a person's skill levels, and subsequently, engagement in flow-conducive, challenge – skill balanced activities appears to be an important pathway toward the actualisation of one's ideal affective experience (Bruya, 2010). The literature has established that prolonged engagement in flow-conducive activities is associated with more positive affect (Landhäußer & Keller, 2012). Our study adds to this literature by suggesting that challenge-skill balanced activities not only make people feel good, but make them more likely to feel the specific positive states they value and ideally want to feel (in our case, LAP vs. HAP). Future research is needed to see if this generalises to other cultural samples.

It is also noteworthy that the actual-ideal affect discrepancies in underchallenging activities were only slightly larger than those in balanced activities in Study 1. This suggests that the affective profile of underchallenging activities may have a similar (but to a lesser extent) alignment to a person's affective preferences as their more flow-conducive, challenge-skill balanced counterparts. In the literature, low-challenge, high-skill conditions are sometimes labelled as "relaxation" (Hektner et al., 2007). This implies that the affective experience in such activities can be positive (compared to overchallenging activities) and related to one's preferred relaxing mode. For example, whereas people preferring LAP states may find mind-wandering in a quiet place relaxing, those preferring HAP states may seek relaxation by partying with friends. This is also consistent with the literature depicting the difference in ideal vacations between people preferring HAP states and those preferring LAP states (Tsai, 2007). Taken together, whereas an underchallenging, relaxing activity may still reflect personal preferences of affective states alongside a balanced, flow-conducive activity, the latter remains an "optimal" condition given its simultaneously high levels of LAP and HAP states (see Figure 1).

We also found partial support for the hypotheses that the discrepancy between people's actual and ideal affect is stronger when they are engaged in pleasant and familiar activities, suggesting that those activities not only elicit positive states but, more specifically, the positive states that people ideally want to feel. Previous studies have found that the more people value LAP, the more they enjoy low-arousal activities (Chim et al., 2018). Interestingly, in Study 2, the discrepancy between actual and ideal LAP was larger during more familiar activities, which also induced lower arousal states (e.g. Aron et al., 2000). The discrepancy between actual and ideal HAP was larger during more pleasant activities. This finding seems consistent with the arguments in Petrolini and Viola (2020) that arousal and valence could be positively associated with each other so that people could better achieve their ideal HAP during pleasant activities.

Taken together, the findings of Study 1 and Study 2 suggest that the extent to which people achieve their ideal affect may depend on the characteristics of people's activities. Individuals are usually advised to engage in social and/or physical activities to experience more positive emotions in general (e.g. McAuley & Rudolph, 1995; Srivastava et al., 2008). The findings of our studies suggest that individuals who would like to achieve their ideal LAP states to a greater extent could be advised to engage in more familiar activities, whereas individuals who prefer ideal HAP states to a greater extent could be advised to engage in more pleasant activities. Engaging in flow-conductive activities facilitates achieving both ideal LAP and HAP states.

The role of age

We did not find any statistically significant cross-level interactions between age and activity characteristics on actual-ideal affect discrepancy. If striving to achieve one's ideal affective states is a form of emotion regulation, this finding appears to be consistent with studies that find no age difference in emotion regulation (Isaacowitz, 2022; Isaacowitz et al., 2015; Rovenpor et al., 2013). A recent review paper by Isaacowitz (2022) concluded that "results suggested few adult age differences in emotion regulation and limited support for the idea that older adults are better" (p. 1), especially for research using an experience-sampling method. For example, Livingstone and Isaacowitz (2021) asked participants to report their affective states and their emotion regulation strategies in an experience-sampling study. There were no age-related differences in the frequency of emotion regulation. However, they found age-related differences in the types of emotion regulation strategies used, with older adults using positive strategies slightly more than other age groups. Eldesouky and English (2018) did not find age-related differences in the daily use of situation selection, modification, distraction, or reappraisal either. Supporting the arguments in Isaacowitz (2022), our findings may also suggest that there are more age-related similarities than differences in the moderating role of activities in the daily regulation of actual and ideal affect. That said, we acknowledge that our survey design did not directly measure whether participants proactively used any of the emotion regulation strategies to reduce the actual-ideal affect discrepancies. Thus, future studies are needed to further investigate the psychological mechanism behind the day-to-day achievement of ideal affect across adulthood.

Although none of the within-person associations was significantly moderated by age, we observed some age-related differences at the between-person level. We found that older adults reported a smaller actual-ideal discrepancy in HAP, suggesting that they are more successful in meeting their ideal HAP states (Scheibe et al., 2013). This is consistent with Tse et al. (2020), which found that for European Americans, Chinese Americans, and Hong Kong Chinese, older adults had smaller actual-ideal discrepancies than younger adults. Older adults were also found to report greater activity pleasantness, which may be attributable to their greater autonomy in engaging in daily activities (e.g. Kaskie et al., 2008; Krantz-Kent & Stewart, 2007). Interestingly, person-level activity pleasantness was more strongly associated with younger (vs. older) adults' attainment of desired HAP states across the data collection period, possibly due to their more expanded future time leading to a greater value placed on HAP states (Fung & Jiang, 2016; Jiang & Fung, 2019; Jiang et al., 2016). Further investigation is necessary to test this hypothesis.

Limitations and future directions

Our research has several limitations. First, in Study 1, we measured participants' actual affect retrospectively (instead of concurrently). Although we manipulated the recall prompts to compare activities with various challenge and skill levels, we did not examine the time-lagged discrepancy between actual and ideal affect. Further, Study 1 only measured ideal affect once. Because ideal positive affect is likely to have a higher value than actual affect, it is difficult to test whether the reduction of actual-ideal affect discrepancy observed in flow-conducive activities is due to merely an increase in actual positive affect or the attainment of ideal level of positive affect. We posit that these effects are not mutually exclusive, meaning that the existence of one effect does not negate the possibility of another. That is, both the "maximizing/pro-hedonic" principle (the more positive affect the better) and "satisficing" principle (experiencing positive affect up to a desired level, perhaps in light of cultural values or perceived benefits) may drive the observed differences (see Tamir, 2009 for a review on the co-existence of multiple motivations for experiencing specific affective states). In Study 1, because (a) only in rare cases did people report actual positive affect that was considerably higher than their ideal affect and (b) findings on the *absolute* actual-ideal affect differences were largely similar to the ones we reported (see Supplemental Materials), we posit that maximising actual positive affect was unlikely the sole reason behind the reported findings. Similarly, Study 2 demonstrated significant connections between affect discrepancy and activity features. However, there were only weak to moderate correlations between the affect discrepancy and ideal/actual affect, suggesting that neither ideal affect nor actual affect alone could fully explain the reported results. That said, it is necessary for future research to temporarily manipulate ideal affect in an opposite direction (i.e. wishing to experience less positive affect than the actual level; Zhou et al., 2023) to examine these two regulation principles further. Future studies can also examine the impact of flow experiences on actual affect using designs with less delayed measures, such as an experience sampling design with repeated measurements of ideal affect, to further validate the findings (Hektner et al., 2007).

Second, we did not ask participants whether the activities had been assigned by others or selected by themselves. Autonomy may influence the process of actual-ideal affect regulation in different situations (Lay et al., 2018). Additionally, due to the intensive repetitive nature of the experience sampling design, we used mostly single-item measures in the experience surveys in Study 2 to reduce the burden on participants (Mehl & Conner, 2012). Although previous studies have provided support for the validity of the items, future research can replicate the findings with other affective items or activity-related questions. Third, it would be important to examine individuals' actual and ideal affect when they are actually experiencing activities that are flow-conducive, pleasant, and familiar. In these designs, it might also make sense to include behavioural measures of actual affect. Fourth, due to the complexity of the data analyses, we did not investigate other characteristics of one's social or physical situations (e.g. having positive or negative social interactions) on the discrepancy between actual and ideal affect.

In summary, using diverse research methods, the overall patterns of findings suggest that that engaging in flow-conducive, familiar, and pleasant activities was associated with smaller actual-ideal affect discrepancies. These findings take us one step closer to understanding the specific circumstances that might help us approach our ideal affect in daily life.

Notes

1. In addition to this difference score, another operationalization of actual-ideal affect relationship is the correlation between actual and ideal affect, or "correspondence convergence" (Neubauer et al., 2020). Conceptually, however, attaining a perfect correlation ($r = 1.00$) between actual and ideal affect can mean that actual and ideal affective states go up and down to the same degree but still differ in mean levels. Although this is beyond the scope of this manuscript, we have included the investigation of the actual-ideal correspondence as supplementary analyses for interested readers.
2. We acknowledge that the actual-ideal discrepancy scores can be positive when actual affect scores are higher than ideal affect scores. In other words, more positive discrepancy scores suggest greater *absolute* differences between actual and ideal affect. Such cases are uncommon: only 5.8% and 10.7% activities in which participants reported actual LAP and HAP affect that were higher than their ideal affect by 1 *SD*, respectively. Nevertheless, we have rerun our analyses with the actual-ideal absolute difference scores as outcomes. The findings, which are in line with our main analyses, are reported as supplementary materials for interested readers.

Disclosure statement

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