

Inducing Positive Affect and Orientations to Happiness: Is Matching Better?

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Online mood induction procedures (MIPs) for happiness have shown inconsistent and often modest effects, and the potential benefit of personalizing such inductions remains unclear. This study evaluated an online, film-based MIP that targeted three orientations to happiness: engagement, meaning, and pleasure. This study further investigated whether matching film clips to participants' dominant orientations to happiness enhanced the effectiveness of the MIP. Data was collected via MTurk. Participants ($N = 166$) were randomly assigned to a matched condition, in which they watched a film clip that targeted their dominant orientation(s) to happiness, or an unmatched condition. Mixed ANOVA was used to test the hypothesis that happiness can be induced via an online, film-based MIP and that a matched film MIP would be more effective at inducing happiness than an unmatched film MIP. Results indicated that happiness can be induced online, but the effect size is modest ($d = 0.43$). A sizeable proportion of the sample did not report an increase in happiness. In primary analyses including all participants, increases in happiness did not differ between matched and unmatched conditions. These results corroborate recent findings that online positive or happiness inductions are effective but underscore the importance of considering success rate in study analyses and sample size planning. These results also contribute to the growing database of film clips validated to induce positive affect in an online setting. Future research is needed to identify factors that may enhance the effect of positive affect MIPs.


Keywords. mood induction, positive affect induction, orientations to happiness, film, online experiments


The positive psychology movement emerged to address an overemphasis on pathology and negative affect in clinical psychology, promoting the study of positive emotions, strengths, and processes that enhance well-being (Duckworth et al., 2005; Linley et al., 2006; Sheldon & King, 2001). This work has yielded evidence that interventions targeting positive affect can improve well-being (Bolier et al., 2013; Carr et al., 2021; Di Pompeo et al., 2023; Sin & Lyubomirsky, 2009) and has extended to psychopathology research, where positive affect is increasingly recognized as relevant to disorders such as depression and anxiety (e.g., Heininga & Kuppens, 2021; Taylor et al., 2017). Within this literature, mood induction procedures (MIPs) have served as a key experimental tool, with positive MIPs being used to examine emotional and cognitive reactivity in depression (Falkenberg et al., 2012), test effects of positive mood on treatment processes (van Veen et al., 2024), and augment interventions such as CBT for depression prevention (McGinn et al., 2019). As research on the role of positive affect in well-being and pathology continues to expand, the identification of robust positive affect MIPs is essential to advancing this work.


Decades of research indicate that MIPs reliably alter mood in

laboratory settings (Joseph et al., 2020; Lench et al., 2011; Westermann et al., 1996). A recent meta-analysis of 874 samples found that MIPs produced an average mood change of approximately one standard deviation (Joseph et al., 2020) but also revealed substantial heterogeneity across target emotions and induction procedures. Notably, MIPs targeting negative affect were both more common and more potent than MIPs targeting positive affect ($k = 665$ vs. 346 ; $\delta = 1.59$ vs. 0.91). Among positive MIPs, effectiveness varied widely, with larger effects observed for film clips, autobiographical recall, and facial expressions ($\delta > .90$), and smaller effects for procedures such as jokes or music without explicit mood instructions ($\delta < .50$).

Most of the positive MIPs included in Joseph et al. (2020)'s meta-analysis targeted positive affect broadly. A relatively smaller number targeted the discrete emotional state of happiness ($k = 84$), with similarly variable effects ($\delta = 0.62$ – 2.18) and limited data for specific induction procedures ($k = 9$ – 18 across procedures). These findings highlight the lack of robust evidence for happiness MIPs and the need for further study in this area. Although correlations between happiness and positive affect more broadly are strong (Diener et al., 2010; Lyubomirsky & Lepper, 1999), positive affect includes other distinct emotional states (e.g., calmness, awe, pride, excitement). Research indicates that different positive emotions vary in their physiological and neurobiological profiles as well as in their effects on cognition and motivation (Shiota et al., 2017), underscoring the importance of distinguishing happiness MIPs from the broader and more heterogeneous category of positive MIPs.

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Internet-Based Happiness MIPs

More and more research is being conducted online, a trend that preceded and was accelerated by the COVID-19 pandemic. Internet-based MIPs offer advantages such as lower cost, greater efficiency, increased anonymity, and more diverse samples (Ferrer et al., 2015; Fox & Moore, 2021; Hamamura & Mearns, 2020), but also present challenges related to reduced environmental control and potential participant disengagement (Fox & Moore, 2021; Shevchenko & Bröder, 2019). These concerns can be mitigated through design features such as monitoring time on task, restricting participants' ability to advance through the study prematurely, instructing participants to complete the study in a distraction-free environment, and including attention checks (Gilman et al., 2017; Hamamura & Mearns, 2020; Shevchenko & Bröder, 2019). Existing evidence for online happiness MIPs is limited and mixed. In their meta-analysis, Ferrer et al. (2015) found a non-significant effect for happiness MIPs, although this was based on only three studies, whereas Marcusson-Clavertz et al. (2019) reported a large effect using a multimodal induction. Further validation of internet-based happiness MIPs is therefore particularly important as experimental research continues to move online (Ferrer et al., 2015).

Film and the Standardization versus Personalization of MIPs

Film-based MIPs are among the most widely used and effective induction procedures. In Joseph et al. (2020)'s meta-analysis, film clips with explicit emotional instructions produced the largest effects overall and, despite not yielding the largest effects for positive MIPs specifically, were supported by the largest evidence base and showed relatively low heterogeneity. Similarly, Ferrer et al. (2015) reported that video-based inductions produced larger effects than other online MIPs. Film clips offer several advantages, including standardization across participants, dynamic and engaging content, and relatively low ethical concerns due to their similarity to everyday media exposure. However, a key limitation of film and other standardized MIPs is their lack of personalization. In contrast, autobiographical and imagination-based MIPs allow individuals to generate personally relevant stimuli and as such, may elicit stronger emotional responses. Although meta-analytic findings suggest standardized MIPs are more effective overall (Joseph et al., 2020), some experimental studies indicate that personalized inductions may produce greater emotional intensity, particularly for happiness (Salas et al., 2012), highlighting the need for further research.

The "Personalization" of Film MIPs for Happiness: Orientations to Happiness

One way to maintain the advantages of standardized MIPs while introducing some degree of personalization is to consider individuals' orientations to happiness (Seligman, 2002). Rooted in ancient Greek philosophy, researchers have distinguished between hedonic and eudaimonic perspectives of happiness (Anić & Tončić, 2013; Ryan & Deci, 2001). The hedonic perspective focuses on maximizing pleasure and minimizing pain, whereas the eudaimonic perspective prioritizes realizing one's talents and actualizing one's full potential to serve a greater purpose (Anić & Tončić, 2013; Giannopoulos & Vella-Brodrick, 2011; Ryan & Deci, 2001; Ryff & Singer, 1998). While research on happiness has indicated that well-being includes both hedonic and eudaimonic elements (Ryan & Deci, 2001), Seligman (2002) proposed that individuals may vary in

their predominant orientation to happiness. According to his Authentic Happiness Theory (Seligman, 2002), later expanded into the PERMA theory of well-being more broadly (Seligman, 2011), there are three basic orientations to happiness: engagement, meaning, and pleasure. Pleasure and meaning align with hedonic and eudaimonic approaches, respectively, while engagement reflects the pursuit of flow states characterized by deep absorption (Csikszentmihalyi, 1990; Kavčič & Avsec, 2014). These orientations to happiness reflect individual differences in the types of positive experiences individuals are motivated to pursue and find rewarding (Seligman, 2002).

The Orientations to Happiness (OTH) questionnaire (Peterson et al., 2005a) has been used to assess the three orientations, showing that they are moderately related but distinct dimensions that vary across individuals and cultures and predict life satisfaction (Kavčič & Avsec, 2014; Park et al., 2009; Peterson et al., 2005b). Given evidence of reliable individual differences in happiness orientations, mood induction stimuli that align with an individual's predominant orientation may be more effective in eliciting happiness, as they are more likely to be perceived as personally meaningful and motivationally relevant. On the other hand, some research has suggested overlap between the orientations, particularly between engagement and meaning, perhaps reflecting a broader eudaimonic dimension (Anić & Tončić, 2013). Whether happiness orientations show functional distinctiveness in the context of mood induction remains unclear. To our knowledge, no prior research has tested whether matching MIP stimuli to individual orientations enhances induction efficacy.

The Present Study

The present study evaluated the efficacy of a film-based online MIP for the discrete emotion of happiness. Three film clips that conveyed each of Seligman's (2002) happiness orientations were tested. Additionally, we tested whether incorporating personalization by matching film clips to participants' dominant orientation to happiness would enhance induction efficacy. We hypothesized that (1) happiness would be successfully induced via the film-based online MIP, such that participants would report a significant increase in happiness from baseline to post-MIP; and (2) a film MIP matched to participants' dominant orientation to happiness would increase happiness more than a film MIP that did not match participants' dominant orientation.

Method

Participants

Participants were recruited via Amazon's Mechanical Turk (MTurk). Eligibility criteria included being age 18 years or older, English-speaking, and residing in the United States. Consistent with recommendations for online data collection (Chmielewski & Kucker, 2020; Gilman et al., 2017), several strategies were used to ensure data quality, including a participant engagement verification item asking participants to describe the film clip they viewed, an attention check assessing consistency between film ratings and film categorizations, and restrictions preventing participants from advancing through the survey prematurely. Participants who exited from the survey early or completed the screening survey in under 16 seconds were excluded.

A total of 1858 participants completed a screening survey, which included demographic questions and the OTH questionnaire. To be eligible for the full study, participants were required to have a dominant happiness orientation, which was defined as endorsing one or two orientations as categorically higher than at least one other orientation, based on tertile categorizations of each OTH subscale (Giannopoulos & Vella-Brodrick, 2011; see Measures). Participants endorsing one orientation as higher than the other two were coded dominant type 1 (D1), whereas those endorsing two equally high orientations exceeding the third were coded dominant type 2 (D2).¹ In our sample, 25% of respondents endorsed one dominant orientation, 10% endorsed two dominant orientations, and 65% did not endorse a dominant orientation (i.e., they endorsed all orientations equally), which thus limited the pool of eligible participants. Of the 518 eligible participants, 166 (D1 $n = 117$, D2 $n = 49$) completed the study and passed all attention and data quality checks.² The sample size was determined via a priori power analysis that indicated a total sample of 150 participants (75 participants per group) would provide 80% power to detect a small effect (Cohen's $f = .15$) for the difference between the matched and unmatched conditions on change in happiness from baseline to post-MIP.

Measures

Demographic Questionnaire. Participants reported their age, gender identity, race, education level, and language.

Orientations to Happiness Questionnaire (OTH; Peterson et al., 2005a). This 18-item questionnaire assesses the three orientations to happiness per Seligman's (2002) Authentic Happiness Theory. It is composed of three 6-item subscales: pleasure, engagement, and meaning. Example items include: "life is too short to postpone the pleasures it can provide" (pleasure), "I am very absorbed in what I do" (engagement), and "I have spent a lot of time thinking about what life means and how I fit into its big picture" (meaning). Respondents rate each item on a 5-point scale ("1 = very much unlike me" through "5 = very much like me"). Subscale scores were calculated by summing the relevant items, yielding a score range of 6–30 per subscale. Subscale scores were split into tertiles, with scores 6–13 classified as low, 14–22 as medium, and 23–30 as high. A principal components analysis of the OTH provided strong support for the three distinct orientations (Peterson et al., 2005b). In the current sample, internal consistency was good to excellent for the meaning ($\alpha = .86$) and pleasure ($\alpha = .92$) subscales, but marginal for the engagement subscale ($\alpha = .62$).

Visual Analog Mood Scale (VAMS; Aitken, 1969). Participants were asked to respond to four VAMS assessing the discrete emotional states of happiness, sadness, anxiety, and calmness. Although the happiness ratings were the primary outcome of interest, the sad, anxious, and calm scales were included to minimize demand characteristics and permit evaluation of the emotional specificity of the MIP effects. Each VAMS consisted of a horizontal line ranging from 0 ("not at all") to 100 ("extremely"), and participants were asked to place a mark along the horizontal line to indicate their current level of each emotion. The VAMS was selected as the primary outcome measure given that visual analog scales are commonly used in experimental emotion research, show good convergent validity with multi-item rating scales, and are sensitive to transient changes in affect, making them well suited for

repeated assessment of momentary mood states (Ahearn, 1997; Betella & Verschure, 2016).

Verification of Participant Engagement. After viewing the film clip during the MIP, participants completed a mandatory open-ended accuracy check requiring them to describe the content of the clip they viewed.

Film Clips

Three film clips were selected to target each of the orientations to happiness (engagement, meaning, and pleasure) as defined by Authentic Happiness Theory (Seligman, 2002). To target engagement, or a state of flow/absorption, a scene from *Almost Famous* was selected that depicts a group of musicians and their companions singing in unison on a bus ride. This clip was selected because it captures the people becoming absorbed in the activity of singing and losing their sense of self-consciousness. To target meaning, a scene from *Dead Poets Society* was selected that depicts a group of students individually and defiantly rising to stand on their desks and proclaim "O Captain! My Captain!" in support of their teacher who has been unjustly fired. This scene has been previously used in MIP research to induce positive affect (Schaefer et al., 2010). To target pleasure, a scene from *When Harry Met Sally* was used that depicts a woman pretending to have an orgasm in a cafe. This clip was selected because it targets positive emotions, such as humor/amusement and pleasure, without overlapping with the essence of the engagement and meaning orientations. Furthermore, this scene has been frequently used to induce general positive affect, happiness, and amusement in previous studies (Gross & Levenson, 1995; Hagemann et al., 1999; Rottenberg et al., 2007; Schaefer et al., 2010; Uhrig et al., 2016). The three film clips were each a few minutes in length, though exact duration varied across the clips (*When Harry Met Sally*: 3 minutes; *Almost Famous*: 2 minutes 30 seconds; *Dead Poets Society*: 4 minutes).

Pilot Testing

Pilot testing with an independent sample of participants recruited from MTurk ($N = 73$) was conducted to determine whether the film clips selected for the study captured their intended happiness orientation. Demographic characteristics of the pilot sample are summarized in Table 1. The participants watched all three film clips. They were then provided with descriptions of the three orientations to happiness and were asked to rate the degree to which each film clip captured the different orientation on a 4-point scale ("1 = not at all" through "4 = very much so") and to select the orientation that best categorizes the film clip.

Mean orientation ratings for each film clip are shown in Table 2. A 3 (film clip: engagement vs. meaning vs. pleasure) \times 3 (orientation rating: engagement vs. meaning vs. pleasure) repeated measures analysis of variance (ANOVA) indicated a significant film clip \times orientation rating interaction, $F(4,144) = 30.14$, $p < .001$, $\eta^2_p = .30$. To follow up the significant interaction, planned paired samples t -tests were conducted to compare orientation ratings for each film clip. For Film 1, intended to capture engagement, participants rated the clip as significantly higher in engagement than meaning, $t(72) = 5.63$, $p < .001$, but engagement and pleasure ratings did not significantly differ from each other, $t(72) = 1.53$, $p = .132$. For Film 2, intended to capture meaning, participants rated the clip as significantly higher in meaning than engagement, $t(72) = 4.50$, $p <$

.001, and pleasure, $t(72) = 6.04$, $p < .001$. Finally, for Film 3, intended to capture pleasure, participants rated the clip as significantly higher in pleasure than meaning, $t(72) = 6.56$, $p < .001$, and engagement, $t(72) = 2.49$, $p = .015$.

Table 1. Pilot study demographic characteristics

	Participants ($n = 73$)
Age, M (SD)	35.74 (10.18)
Gender, n (%)	
Female	42 (57.5)
Male	30 (41.1)
Non-binary/third gender	1 (1.4)
Ethnicity, n (%)	
White	47 (64.4)
Black or African American	11 (15.1)
Hispanic or Latinx	5 (6.8)
Asian	4 (5.5)
Other	6 (8.4)
Education, n (%)	
4-year college	41 (56.2)
Some college	10 (13.7)
High school or equivalent	9 (12.3)
Postgraduate	9 (12.3)
2-year college	4 (5.5)

Regarding the orientation categorizations, for each of the three film clips, participants most frequently selected the intended orientation. Thus, the film clips largely captured the specific orientations to happiness intended.

Procedure

Data were collected from December 2021 to March of 2022. From MTurk, participants were directed to Qualtrics where they completed the surveys. The screening survey, including the demographic questions and the OTH questionnaire, took approximately three minutes on average to complete. Eligible participants who agreed to participate in the full study were randomly assigned to one of two conditions: a matched or an unmatched MIP. Participants first completed a pre-induction VAMS and were then instructed to watch the film clip and provide a brief written description of the content of the clip. Participants in the matched condition watched one of the three film clips that targeted their dominant orientation to happiness. If participants endorsed two dominant orientations (i.e., D2 participants), they were randomly assigned to watch a film clip matched to one of those orientations. Participants in the unmatched condition watched one of the three film clips that did not match their dominant orientation(s) to

Table 2. Orientation ratings by film clip from pilot testing sample

	Mean Orientation Rating			% Categorizations		
	Engagement	Meaning	Pleasure	Engagement	Meaning	Pleasure
Clip 1 (intended engagement)	2.53 _a (0.65)	1.85 _b (0.88)	2.38 _a (0.70)	49.3	9.6	41.1
Clip 2 (intended meaning)	1.99 _b (0.94)	2.55 _a (0.80)	1.63 _c (1.07)	15.1	72.6	12.3
Clip 3 (intended pleasure)	1.81 _b (1.05)	1.14 _c (1.07)	2.19 _a (0.92)	27.4	8.2	64.4

Note. Standard deviations in parentheses. Means with different subscript letters in the same row differ significantly at $p < .05$.

happiness. Following the film clip, participants completed a post-induction VAMS. The study took approximately six minutes to complete on average. Participants were paid \$.25 for their participation. If invited back for the second half of the study, participants received an additional \$.01 via the MTurk “Bonus Worker” function.

Ethical Considerations

This study was reviewed and approved by the WCG Institutional Review Board (Protocol #20215188) and conducted in accordance with the ethical standards of the Declaration of Helsinki and the American Psychological Association. Documentation of informed consent was waived by the IRB because the research involved no more than minimal risk, was fully anonymous, and did not include any procedures for which written consent is normally required. Prior to participation, all participants viewed an information statement describing the study’s purpose, procedures, voluntary nature, compensation, and investigator contact information. No identifying information was collected, and data were analyzed anonymously.

Results

Sample Characteristics

A total of 166 participants were included in the final sample, of whom 82 (49%) were male, 81 (49%) were female, and 3 (2%) were non-binary. The mean age was 43 years old ($SD = 13.77$ years). The sample was 72% White, 12% Asian, 9% Black or African American, 5% Hispanic or Latino, and 2% Biracial. Regarding education background, 41% had a 4-year college degree, 20% had completed some college, 16% had postgraduate degrees, 12% had a 2-year college degree, and 11% had a high school or equivalent degree. Demographic characteristics and comparisons across conditions are presented in Table 3.

Age, gender, and race did not significantly differ between the two conditions (all $ps > .05$). Education significantly differed between the two conditions, with a higher proportion of participants with a high school or equivalent education in the matched group than in the unmatched group, $\chi^2(4) = 9.55$, $p = .049$. However, education level was not significantly related to the outcome of change in VAMS happiness ratings, $F(4, 161) = 0.31$, $p = .873$, and thus was not considered further in the analyses.

Hypothesis Tests: Effects of Matched and Unmatched Film Clips on Happiness

Mean VAMS ratings at baseline and post-MIP and change in VAMS ratings by condition are shown in Table 4. Outliers were defined as values that were more than 3.29 standard deviations away from the grouped means as recommended by Tabachnick and Fidell (2019).

Table 3. Demographic characteristics across conditions

	Matched (<i>n</i> = 75)	Unmatched (<i>n</i> = 91)	<i>F</i> / χ^2	<i>p</i>
Age, <i>M</i> (<i>SD</i>)	41.99 (13.36)	43.84 (14.12)	.58	.449
Gender, <i>n</i> (%)				
Female	36 (48)	45 (49.5)	.01	.931
Male	37 (49.3)	45 (49.5)		
Race, <i>n</i> (%)				
White			3.71	.294
Black or African American	53 (70.7)	66 (72.5)		
Asian	4 (5.3)	11 (12.1)		
Other	11 (14.7)	9 (9.9)		
Other	7 (9.3)	5 (5.5)		
Education, <i>n</i> (%)				
HS or equivalent	14 (18.7)	5 (5.5)	9.55	.049
Some college	11 (14.7)	22 (24.2)		
2-year college	8 (10.7)	12 (13.2)		
4-year college	28 (37.3)	40 (44)		
Postgraduate	14 (18.7)	12 (13.2)		

One outlier on the change in VAMS happiness was identified in each of the matched and unmatched MIP conditions. Primary analyses were conducted and are reported with the full sample. However, sensitivity analyses were also conducted excluding the two outliers, consistent with recommendations that emphasize transparent reporting and evaluating the stability of results in the handling of outliers (Howitt & Cramer, 2011; Stevens, 2001; Wilcox, 2022). The results were unchanged except in one instance as noted below.

A 3 (film clip: engagement vs. meaning vs. pleasure) \times 2 (condition: matched vs. unmatched) \times 2 (time: baseline vs. post-MIP) mixed ANOVA was conducted on the VAMS happiness ratings. There was a significant main effect of time, $F(1,160) = 26.68$, $p < .001$, $\eta^2_p = .14$, such that happiness ratings increased from baseline to post-MIP (Cohen's $d = 0.43$). No other effects in the model were statistically significant, including the hypothesized condition \times time interaction, $F(1,160) = .01$, $p = .935$, $\eta^2_p = .00$. Thus, the films were effective at inducing happiness, but the matched and unmatched MIPs were equally effective. There was also no significant film clip \times time interaction, $F(2,160) = .67$, $p = .511$, $\eta^2_p = .01$, or film clip \times condition \times time interaction, $F(2,160) = .36$, $p = .696$, $\eta^2_p = .01$, which indicates that the three film clips were equally effective at inducing happiness.³

Exploratory Analyses: Moderation of Matching Effects on Happiness by Dominant Type

Mean VAMS happiness ratings at baseline and post-MIP and change in VAMS happiness ratings by condition and dominant group are shown in Table 5. To evaluate the possibility that the hypothesized effects of interest may differ between participants who endorsed one versus two dominant happiness orientations, a 2 (time: baseline vs. post-MIP) \times 2 (condition: matched vs. unmatched) \times 2 (dominant type: D1 vs. D2) mixed ANOVA was conducted. The film clip was not included as a factor in this model, given that it was non-significant in the previous model. Consistent with the prior model, none of the effects in the model were statistically significant (all $ps > .05$), other than the main effect of time already reported.

However, when the two outliers were excluded, there was a significant condition \times time \times dominant type interaction, $F(1,160) = 4.24$, $p = .041$, $\eta^2_p = .03$. To follow up the significant interaction, separate 2 (time) \times 2 (condition) repeated measures ANOVAs were conducted for the D1 and D2 groups. For the D2 group only, there was a significant condition \times time interaction, $F(1,46) = 5.93$, $p = .019$, $\eta^2_p = .11$. The interaction indicated that for D2 participants the increase in happiness was significantly greater for the matched MIP (Cohen's $d = 0.98$) compared to the unmatched MIP (Cohen's $d = 0.40$). This finding should be interpreted with caution, as the role of dominant type was not hypothesized a priori and the effect was only significant after the removal of outliers.

Table 4. Mean scores on VAMS scales in the total sample and across conditions

	Matched	Unmatched	Total
VAMS Happiness	67.07	64.10	65.44
Baseline	(26.80)	(24.96)	(25.77)
VAMS Happiness	72.20	69.74	70.85
Post-MIP	(24.56)	(26.49)	(25.59)
VAMS Happiness	5.13	5.64	5.41
Change	(14.33)	(11.01)	(12.58)
VAMS Sadness	18.03	20.64	19.46
Baseline	(22.82)	(27.17)	(25.26)
VAMS Sadness	18.89	20.04	19.52
Post-MIP	(21.88)	(27.12)	(24.82)
VAMS Sadness	0.87	-0.59	0.07
Change	(20.61)	(13.30)	(16.96)
VAMS Anxiety	22.85	26.55	24.88
Baseline	(27.26)	(30.09)	(28.82)
VAMS Anxiety	19.01	20.45	19.80
Post-MIP	(24.39)	(26.85)	(25.70)
VAMS Anxiety	-3.84	-6.10	-5.08
Change	(19.92)	(12.79)	(16.39)
VAMS Calmness	75.64	72.59	73.97
Baseline	(22.92)	(25.23)	(24.19)
VAMS Calmness	71.71	72.30	72.03
Post-MIP	(21.97)	(26.67)	(24.59)
VAMS Calmness	-3.93	-0.30	-1.94
Change	(20.20)	(14.97)	(17.57)

Note. Standard deviations in parentheses. MIP = Mood Induction Procedure; VAMS = Visual Analogue Mood Scale.

Exploratory Analyses: Effects of Matched and Unmatched Film Clips on Other Emotions

Although the VAMS happiness ratings were the primary outcome, the 3 (film clips) \times 2 (condition) \times 2 (time) ANOVAs were repeated for sadness, anxiety, and calmness ratings to assess the specificity of the effects of the MIP to happiness. For sadness, there was a significant three-way interaction, $F(2, 160) = 3.36$, $p = .037$, $\eta^2_p = .04$. There were no other significant effects in the model ($ps > .05$), including the main effect of time, which indicates that there was no overall change in sadness from baseline to post-MIP. To probe the significant interaction, separate 2 (condition) \times 2 (time) ANOVAs were conducted for each of the film clips. There was a significant condition by time interaction for only the film clip targeting pleasure (from When Harry Met Sally), $F(1, 43) = 5.76$, $p = .021$, $\eta^2_p = .12$. Paired samples t-tests by condition showed that

sadness decreased significantly only for participants who had a dominant pleasure orientation (matched; $M = -7.77$, $SD = 14.64$), and not for participants who did not have a dominant pleasure orientation (unmatched; $M = 0.91$, $SD = 9.12$), after watching the film clip targeting pleasure. No other effects were significant in any of the models (all $ps > .05$).

Table 5. Mean scores on VAMS happy scale across MIP condition and dominant groups

	Matched		Unmatched	
	D1	D2	D1	D2
VAMS Happy pre-MIP	67.61 (26.51)	65.67 (28.15)	61.22 (26.44)	70.57 (20.22)
VAMS Happy post-MIP	70.93 (24.59)	75.48 (24.76)	66.98 (28.00)	75.93 (21.93)
VAMS Happy Change	3.31 (15.40)	9.81 (9.98)	5.76 (9.93)	5.36 (13.32)

Note. Standard deviations in parentheses. D1 = participants who endorsed a single dominant orientation to happiness; D2 = participants who endorsed two equally dominant orientations to happiness; MIP = Mood Induction Procedure; VAMS = Visual Analogue Mood Scale.

For anxiety, only the main effect of time was significant, $F(1, 160) = 15.66$, $p < .001$, $\eta^2_p = .09$, such that anxiety ratings decreased overall from baseline to post-MIP, collapsing across condition and film clips. All other effects in the model were non-significant ($ps > .05$).

Lastly, for calmness, there was a significant three-way interaction, $F(2, 160) = 3.78$, $p = .025$, $\eta^2_p = .05$. There were no other significant effects in the model ($ps > .05$), including the main effect of time, which indicates that there was no overall change in calmness from baseline to post-MIP. To probe the significant interaction, separate 2 (condition) \times 2 (time) ANOVAs were conducted for each of the film clips, followed by paired samples t -tests within condition. There was a significant condition by time interaction for only the film clip targeting meaning (from Dead Poets Society), $F(1, 65) = 6.90$, $p = .011$, $\eta^2_p = .10$. Paired samples t -tests by condition showed that calmness decreased significantly only for participants who had a dominant meaning orientation (matched; $M = -9.24$, $SD = 20.67$), and not for participants who did not have a dominant meaning orientation (unmatched; $M = 2.46$, $SD = 11.77$), after watching the film clip targeting meaning. No other effects were significant in any of the models ($ps > .05$).

Discussion

Given the limited and mixed evidence for happiness MIPs, especially in online contexts, this study evaluated the efficacy of an online film-based happiness MIP and examined whether matching film clips to participants' dominant happiness orientation(s) enhanced MIP efficacy. Three film clips that targeted the orientations to happiness of engagement, meaning, and pleasure, as defined by Authentic Happiness Theory (Seligman, 2002), were first validated in pilot testing and then used to contrast matched and unmatched MIP conditions. As hypothesized, the MIP effectively induced happiness, which is consistent with prior studies (Marcusson-Clavertz et al., 2019). However, matching film clips to participants' dominant orientation(s) did not influence the magnitude of the effect. These findings contribute to the literature

by corroborating a small body of evidence that happiness can be induced through online procedures, providing a novel test of whether tailoring a film-based happiness MIP to individuals' dominant orientations to happiness enhances efficacy, and validating three specific film clips for use in online MIPs targeting happiness.

Overall, participants reported a modest increase in happiness from baseline to post-MIP, as indicated by a Cohen's d of 0.43. Although prior research has shown that positive MIPs produce smaller effects than negative MIPs (Joseph et al., 2020; Ferrer et al., 2015), a phenomenon termed the "negativity bias" (Rozin & Royzman, 2001), the present effect was also smaller than the pooled effect for happiness MIPs reported by Joseph et al. (2020; $d = .79$). One likely explanation is that online MIPs may be less potent than laboratory-based procedures, potentially due to greater environmental distraction and lower participant engagement, reduced social desirability effects, and ceiling effects on mood when completing studies in more comfortable home environments (Ferrer et al., 2015). No differences in efficacy emerged across the film clips, suggesting each may serve as a comparably effective option for future film-based MIP studies. Additionally, whereas Joseph et al.'s meta-analysis included both clinical and nonclinical samples, the present study used an unselected sample. Positive MIPs may yield larger effects in clinical populations with lower baseline positive affect and greater room for improvement (Di Pompeo et al., 2023). Publication bias may also contribute to inflated meta-analytic estimates, and this may particularly be an issue for studies of the effects of induced mood on other processes, which may not be published if the MIP was not successful (Göritz & Moser, 2006).

Although the online film-based MIP effectively induced happiness overall, it was not effective for all participants, with some reporting negligible or even decreased happiness following the MIP. This has implications for studies examining downstream effects of induced happiness on other cognitive, behavioral, and psychophysiological variables, as including participants for whom the happiness MIP was unsuccessful may attenuate effects. Researchers should therefore consider defining a priori criteria for successful induction and restricting analyses accordingly. Whereas prior studies of sadness MIPs have used thresholds such as a 20% increase from baseline or a 20-point VAMS change (e.g., Frayn et al., 2016; Newman & Sears, 2015; Singer & Dobson, 2007; Speirs et al., 2018), lower thresholds may be more appropriate for happiness MIPs given their smaller effects (e.g., a 10% increase from baseline or a 10-point VAMS change). For illustrative purposes, based on these four definitions (20%, 20-point, 10%, and 10-point increase in happiness ratings), the rate of success in our sample was 28%, 13%, 43%, and 35%, respectively. Future studies should account for anticipated induction success rates when determining sample size.

Contrary to hypothesis, the matched MIP condition was not more effective than the unmatched MIP condition. Participants who viewed matched clips reported similar increases in happiness as those who viewed unmatched clips. One possible explanation is that orientations to happiness may not be highly differentiated constructs. Supporting this possibility, 65% of the screening sample did not endorse a clear dominant orientation, and prior research suggests that the three orientations may reflect a broader hedonic and

eudaimonic distinction rather than three fully separable constructs (Anić & Tončić, 2013). Additionally, because the OTH questionnaire assesses value preferences rather than actual behavior (Grimm et al., 2015), self-reported dominant orientations may not reflect meaningful differences in participants' responses to emotionally evocative stimuli. More broadly, despite its intuitive appeal personalization may not enhance the efficacy of MIPs, consistent with meta-analytic findings indicating that personalized induction methods such as autobiographical recall and imagination produce smaller effects than film-based MIPs (Ferrer et al., 2015; Joseph et al., 2020).

Exploratory analyses suggested some limited evidence of differential effects of the matched and unmatched MIP conditions. For participants endorsing two dominant orientations, matched clips produced greater increases in happiness than unmatched clips, perhaps reflecting an especially weak affinity for the third orientation among these participants. However, this finding was only significant after outlier removal and therefore requires replication. Additionally, sadness decreased following the pleasure-targeted clip only among participants endorsing a dominant pleasure orientation, whereas calmness decreased following the meaning-targeted clip only among those endorsing a dominant meaning orientation. Anxiety decreased across all film clips regardless of orientation. Although exploratory, these findings may inform future efforts to target discrete emotional states and are consistent with prior research suggesting that MIPs often produce mixed emotional responses rather than changes limited to the intended emotion (Israel et al., 2021; Scherer & Meuleman, 2013).

Finally, the present study contributes novel data regarding the prevalence of dominant orientation endorsement on the OTH. Consistent with Grimm et al. (2015), few participants demonstrated a clearly dominant orientation, suggesting that this construct may have limited practical utility for research or clinical purposes. This pattern aligns with Seligman's (2002) broader conceptualization of well-being and research findings related to this theory, wherein happiness is associated with endorsement of multiple orientations rather than a single dominant pathway (Anić & Tončić, 2013; Kavčič & Avsec, 2014; Peterson et al., 2005a).

Future research should examine other factors that may enhance happiness MIP efficacy. For instance, Joseph et al. (2020) found that film MIPs are more effective when participants are explicitly instructed to feel the target emotion, whereas combined induction procedures are not generally superior to single procedures. However, little is known about moderators of happiness MIP efficacy specifically. Marcusson-Clavertz et al. (2019) observed a large effect size for an online happiness MIP that combined film, music, and Velten techniques, and thus additional research is needed to evaluate whether combined procedures improve happiness induction. Future research is also needed to evaluate the efficacy of MIPs for other discrete positive emotions (e.g., joy, awe, gratitude; Shiota et al., 2017).

The present findings may have broader implications for well-being promotion and clinical practice. Online film-based MIPs offer an accessible, low-cost method of inducing positive affect and may be useful in digital mental health interventions. Consistent with Fredrickson's (2001) broaden-and-build theory, positive emotions

promote adaptive cognitive and behavioral functioning and build enduring personal resources, highlighting the promise of positive MIPs as a tool for promoting well-being (Di Pompeo et al., 2023) and treating and preventing depression and anxiety (Craske et al., 2019; McGinn et al., 2019).

Limitations

This study has several limitations. First, we reiterate that the matched MIP was more effective than the unmatched MIP among participants who endorsed two dominant orientations to happiness only after removal of two outliers and this finding should therefore be interpreted cautiously pending replication. Second, the OTH engagement subscale demonstrated marginal internal consistency ($\alpha = .62$), which may have introduced measurement error and reduced power to detect true effects. Lower reliability of the engagement subscale has also been reported in other studies (Durón-Ramos et al., 2022; Pollock et al., 2016) and may reflect heterogeneity in item content and broader conceptual concerns regarding the engagement construct, which has been criticized as more difficult to define and distinguish from pleasure and meaning (Anić & Tončić, 2013; Kavčič & Avsec, 2014; Martín et al., 2010). Consistent with this issue, the engagement-targeted film clip yielded similar continuous engagement and pleasure ratings in the pilot sample, limiting our ability to specifically target engagement with this clip. Accordingly, findings related to engagement should be interpreted with caution.

Third, although single-item VAMS ratings are well-suited to the repeated measurement of and detection of change in momentary emotional states, they have lower reliability and validity than multi-item measures. Future research may benefit from using multi-item measures of affect. Fourth, as already noted, relatively few participants endorsed a dominant orientation, limiting generalizability and raising questions about the practical utility of this construct. This pattern suggests that many individuals may experience happiness as a blend of orientations rather than through a single dominant pathway. Finally, participants were classified as having a dominant orientation if one OTH subscale score fell in a categorically higher tertile than at least one other subscale score, which may not reflect a strongly endorsed orientation in absolute terms (i.e., the higher subscale score may have been in only the "medium" tertile). Furthermore, tertile splits treat nearly identical scores as categorically distinct if they fall on opposite sides of the cut-point, such that participants could be classified as having a dominant orientation if their highest subscale score differed from another subscale score by as little as one point. Participants without a strongly pronounced orientation preference may have responded similarly to matched and unmatched film clips, possibly obscuring effects.

Conclusion

The results of the present study demonstrate that happiness can be induced online via film and contribute to the growing database of validated film stimuli for inducing positive affect in online research settings. At the same time, the MIP produced a modest increase in happiness and was unsuccessful for a substantial proportion of participants according to conventional definitions of induction success. Personalizing the MIP by matching film clips to participants' dominant orientation(s) to happiness did not enhance its effectiveness. These findings underscore the need for continued

investigation into factors that may improve the potency and reliability of happiness MIPs. Advancing this work will support current scientific efforts to elucidate the role of positive affect in the development, maintenance, and treatment of psychopathology, as well as in promoting general well-being.

Footnotes

¹Initially, only participants meeting D1 criteria were identified as having a dominant orientation and invited to the study. However, due to difficulty recruiting an adequate sample size, the definition of dominant orientation was expanded to include D2 participants.

² $N = 331$ did not respond to the study invitation; $N = 3$ input incorrect ID numbers, precluding their data from being linked across both parts of the study; $N = 12$ started but did not complete the survey; and $N = 6$ failed the film clip attention check.

³Because film 1 was rated similarly on engagement and pleasure in the pilot testing, pleasure-dominant participants who watched film clip 1 (coded engagement) were recoded as matched. The ANOVA was then repeated as a sensitivity analysis, and the results were unchanged.

Compliance with Ethical Standards

Disclosure of Potential Conflicts of Interest. The authors declare no conflicts of interest related to the research, authorship, and/or publication of this article.

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Ethical Approval. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments, or comparable ethical standards. This study was conducted in compliance with the Western Institutional Review Board (WCG IRB; Protocol #20215188).

Data Sharing Statement. All data and analysis code have been made publicly available at the OSF APA Journal Articles: Data and Related Resources and can be accessed at <https://osf.io/dbx6m/>.

Author Contributions Statement. K. Mageras: conceptualization, investigation, methodology, writing - original draft, writing -review and editing. L. McGinn: supervision, conceptualization, writing - review and editing. L. Quigley: formal analysis, methodology, writing - review and editing.

Informed consent. All participants gave informed consent before their inclusion in the study.

Declaration of Artificial Intelligence Use. AI was used during the writing process to help edit and condense the manuscript for length. All scientific content, interpretations, and conclusions are solely the work of the authors.

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