

The Construction of an Inventory of Responses to Positive Affective States

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Abstract

We report the construction of the Inventory of Responses to Positive Affective States (IRPAS), a trait, self-report measure of response to positive affect. The IRPAS differs from existing measures by addressing a broad set of responses to positive affect, including but not limited to affect regulation strategies, and by considering relevance to a range of positive affective states. In Study 1, qualitative interviews were conducted with 21 individuals to inform item content. In Study 2, factor analysis of the final item set was conducted using data from 540 individuals. Study 3 investigated convergent and divergent validity and test–retest reliability of the resulting 59-item IRPAS. The IRPAS was found to be reliable and valid, and to make a unique contribution to the literature on response to positive mood. Further validation studies should be conducted; potential applications include exploration of positive affect functioning in both clinical and non-clinical populations.

Keywords

positive affect, positive emotions, affect regulation, savoring, dampening

Introduction

Relative to negative emotion functioning, the regulation of positive feelings is an understudied area. Here we report the construction and initial validation in the general population of the Inventory of Responses to Positive Affective States (IRPAS), a trait self-report instrument intended to complement existing measures of response to positive emotion by extending measurement to a broad class of responses to positive states including, but not limited to, strategies that up- or down-regulate mood across a range of different positive mood states. We discuss the rationale for such an extension below.

“Emotion regulation” can be defined as a set of processes that individuals engage in either consciously or non-consciously, and with or without deliberate effort (Gross & Thompson, 2007), that have the intention or effect of increasing, decreasing, or maintaining emotional state. Gross (1998) proposes five stages at which regulation processes may occur: situation selection, situation modification, attentional deployment, cognitive change, and response modification. The IRPAS is most closely concerned with the final stage, response modification. Processes at this stage emerge once the emotion has been elicited, and represent experiential, behavioral, or physiological attempts to modulate the emotional response.

It has been proposed that while some individuals tend to engage in strategies that maintain or increase positive mood (savoring: Bryant, 1989, 2003), others tend to engage in strategies that suppress or reduce it (dampening: Wood,

Hiempe, & Michela, 2003). The study of positive mood up-regulation strategies has revealed a number of subtypes (Bryant & Veroff, 2007; Livingstone & Srivastava, 2012; Quoidbach, Berry, Hansenne, & Mikolajczak, 2010), including behavioral display (expressing emotion), being present (directing attention toward current experience), capitalizing (communicating and celebrating the event with others), positive mental time travel (dwelling on positive emotional memories), engagement (savoring and socializing), betterment (pursuing goals, personal growth), and indulgence (substance use and fantasy). Other behaviors that often arise during positive affect and could act as savoring responses include gratitude and prosocial behaviors such as helping others (Emmons & McCullough, 2003; Isen & Levin, 1972).

Yet behavioral response to positive mood may go beyond the deployment of strategies that have the immediate function of changing or maintaining the emotional state. We may use positive states as a platform from which to reach our goals, for example, by capitalizing upon it and expressing our feelings to others (Langston, 1994), or by using the broader attentional perspective associated with a period of happiness to engage with new opportunities that will

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promote future happiness (Fredrickson, 1998). Positive mood has been found to “undo” the negative effects of engagement in exercises which typically appear to deplete motivational resources; hence, periods of positive mood may represent times when one is best disposed to tackle the next in a series of demanding tasks (Tice, Baumeister, Shmueli, & Muraven, 2007). Finally, the findings of several studies suggest that positive mood renders individuals more open to tackling problems or areas of potential failure (e.g., Reed & Aspinwall, 1998). Thus, individuals may show responses to positive mood states that do not directly regulate the present emotion, but instead channel the resources it imbues toward some other purpose. Alternatively, individuals may display a range of responses to the same positive state, some of which are mood regulatory while others are self- or goal regulatory (and some that overlap in terms of function); these may well complement one another and occur in sequence, in parallel, or in alternation. Therefore, rather than focusing only upon behaviors that serve to directly change state, the IRPAS considers the broader category of behaviors that occur *in response* to positive states, and may not represent deliberate regulatory attempts. In this way, it differs from the most closely related existing instruments. The Ways of Savoring Checklist (WOSC; Bryant & Veroff, 2007) explores a variety of savoring and dampening responses, and as such is concerned primarily with behaviors that increase or decrease positive affect. Similarly, the Emotion Regulation Profile–Revised (ERP-R; Nélis, Quoidbach, Hansenne, & Mikolajczak, 2011), the Positive Events and Responses Survey (PEARS; Gentzler, Palmer, & Ramsey, 2015), the Responses to Positive Affect (RPA; Feldman, Joormann, & Johnson, 2008) scale, and the Inventory of Positive Emotion Regulation Strategies (IPERS; Livingstone & Srivastava, 2012) specifically measure responses that down- and/or up-regulate positive emotions. Finally, the Savoring Beliefs Inventory (Bryant, 2003) measures perceived ability to derive pleasure from past, current, and future positive events. We argue that up- or down-regulation strategies are a subset of the broader class of behaviors that occur in response to positive affect, and thus to assess these responses more generally, a more comprehensive instrument would be needed. Our intention is that the IRPAS should overlap conceptually with these instruments (in terms of measuring behaviors generally thought to up- or down-regulate positive mood), but should also measure categories of response not currently addressed, informed by both theories of positive emotion function and empirical data from qualitative research into positive emotion experience.

Correspondingly, Study 1 describes the findings of qualitative interviews with members of the general population, conducted with the aim of supplementing the existing literature on types of responses to positive mood. We adopted this inductive approach in recognition of the limitations of relying purely upon existing theory to inform the details of our questionnaire items, particularly given that we intend the

scale to address responses beyond those typically considered within savoring and dampening frameworks. Little theoretical or empirical guidance is available as to the forms that these types of responses might take; hence, the need for an exploratory approach (for a discussion of the place of inductive research, see Spector, Roselberg, Ryan, Schmitt, & Zedeck, 2014). The validity of the types of responses putatively measured by the IRPAS, and of the distinctions drawn between them, is then investigated in Studies 2 and 3.

A second unique aspect of the IRPAS is that we took into account, deliberately and explicitly, a range of positive emotional states during item development. Discrete emotion accounts propose that positive emotions fall into categories representing their particular functions in terms of self-regulation and social interaction (Shiota, Keltner, & John, 2006). Correspondingly, particular positive states would be expected to prompt particular types of cognitive and behavioral responses. For example, desire has been found to promote a more narrow attentional focus than does amusement (Gable & Harmon-Jones, 2008). Also concerned with the function of positive emotion, the self-regulation model proposed by Carver and Scheier (1998) views certain positive emotions as indicators of the extent to which our progress toward a goal corresponds to an ideal rate of progress. Thus, emotions such as enthusiasm act as signals to maintain or increase striving toward a goal, whereas satisfaction or contentment signals us to reduce or cease striving toward that goal. Hence, the notion that positive emotions have a function leads to the prediction that different positive states will vary in terms of the typical profile of response associated with them. While the responses measured by existing instruments may well apply to a range of positive emotions, to ensure that the IRPAS is relevant to more than one positive state we deliberately draw upon theory and data concerning response profiles to multiple positive states. Specifically, we use sets of emotion words (labeled *calm*, *happy*, *enthusiastic*, and *active*) corresponding to four locations in affective space on the dimensional model of affect proposed by Russell (1980); this allows investigation of a range of positive states without requiring participants to respond separately with respect to every possible positive emotion.

In summary, the IRPAS is designed to facilitate research into positive emotion, whereby researchers are concerned with *what follows* various positive mood states, in terms of behavior. This may allow more nuanced investigation of some existing theories of positive affect functioning (such as “Broaden and Build”; Fredrickson, 1998), which hypothesize a relationship between positive mood and self- or goal regulation, and may also give greater scope to delineate aspects of positive emotion that are dysregulated in psychological disorders.

Study 1

To inform scale development, in Study 1 we conducted semi-structured interviews with members of the general

public, asking participants to describe their responses to four types of positive states.

Method

Participants, measures, and procedure. The study was approved by the appropriate departmental ethics review board, and all participants gave written, informed consent. Participants were 21 members of the general public, recruited through a database of volunteers and via community advertisement, with no financial remuneration for participation. Participants were required to be aged 18 or above and with sufficient competence in English to complete the interview. The mean age of the sample was 60.30 ($SD = 19.62$, range = 20-87). Seventeen of 21 participants were female. Interviews were conducted by a female interviewer by telephone or in person, dictated by participant preference. The semi-structured interview conducted was developed for the purpose of this study. Participants were asked to consider four positive mood states in turn, selected to correspond to four locations in affective space on the dimensional model of affect proposed by Russell (1980). These were characterized by high activation, moderate positive valence (active, alert, stimulated, determined, or attentive: "active"); high activation, high positive valence (enthusiastic, elated, excited, peppy, lively, or strong: "enthusiastic"); moderate activation, high positive valence (happy, pleased, glad, satisfied, kindly, or warmhearted: "happy"); and low activation, moderate positive valence (calm, at rest, placid, relaxed, quiet, or serene: "calm").

For each state, participants were asked to identify and describe a specific instance of experiencing that state, and then to report what they did and thought once in that positive mood. In particular, they were asked if their actions or thoughts were different when in this state, whether there was anything in particular they did not do or think when in this state, and whether they did or thought anything to try to increase, decrease, or maintain the state. Participants were then asked these questions with reference to how they would typically respond to that type of positive mood. The order in which the four types of positive mood were asked about was counterbalanced across participants. Participant responses were recorded by the interviewer contemporaneously in writing.

Analysis. A framework analysis approach was applied (Ritchie & Spencer, 1994). The first five transcripts were independently coded by two raters, and an initial thematic framework was agreed through a process of consensus and conciliation (Phase 1). The remainder of the transcripts were coded by Rater 1, and changes to the thematic framework were noted (Phase 2). Rater 1 then recoded all interviews using the new framework (Phase 3). The framework and indexing were then checked by Rater 2, and a final framework was agreed (Phase 4). The themes that emerged from

the analysis were then mapped to characterize the nature and range of the concepts identified, the associations between them, and their relationships with the literature (Phase 5). Because an aim of Study 1 was to inform development of multiple items for the IRPAS, subthemes were identified to provide greater detail on the facets of each major theme.

Results

In Phase 1, seven major themes were identified. Two were removed and three new themes added in Phase 2. Phase 4 resulted in removal of two, producing a final set of six broad themes (Table 1); four of which comprised of two or more distinct subthemes. Four subthemes broke down further to give two or more minor subthemes (see supplementary material for details of subthemes). Thematic saturation with respect to the broad thematic framework (whereby analysis of subsequent participants did not result in addition of new themes) was achieved by Transcript 7.

Channeling describes responses which capitalize upon the present positive state and channel the associated motivation, optimism, or energy toward either achieving existing goals or developing new ones. A number of participants reported that on some occasions of positive mood, they continue with what they have planned, regardless of their mood state: We termed this response style *Mood Independence*. Borrowing from the existing literature on this topic, we used the term *savoring* to refer to responses whereby participants actively participated in or enjoyed the mood state, but did not seek to influence it.

In contrast, *mood management* describes strategies used with the stated or apparent intention to influence mood state. Alteration of activation was achieved by altering physiology (e.g., by taking stimulants), engaging in particular thoughts or activities, or selecting particular environments, and this response style appeared in relation to both high and low activation positive states. Participants also described engaging in responses likely to influence the level of pleasantness they were experiencing. Some responses involved approaching pleasant thoughts, activities, or environments, while others involved avoiding unpleasant thoughts, activities, or environments. Responses used with the stated or apparent intention of dampening mood, or of monitoring mood state with a view to keeping it under control, were categorized under the subtheme of *dampening/monitoring*.

A number of participants described engaging in *reflection/reappraisal*, such that they reframed the situation or their life, thought in depth about the self or the world, or analyzed the cause of their mood. The final major theme identified, *connectedness*, describes those responses that appeared to strengthen or reestablish the individual's connection with a larger entity. Many participants described connecting with others by sharing emotion, interacting, or by helping others. A small number of participants described reaffirming their connection with more abstract or higher

Table 1. Themes and Subthemes Identified Relating to Response to Positive States.

Theme	Subtheme	Exemplar quote (Pseudonym, referenced state)
Channeling (n = 20)	Creating/building new opportunities and plans (n = 11) Achieving existing goals (n = 19)	I think of the long term goals. I set markers—smaller goals. (Tracey, Active)
Mood independence (n = 15)		We have a set routine here so I did not do anything different. (Victoria, Active)
Savoring (n = 14)		It happens and I enjoy it. (Annette, Happy)
Mood management (n = 20)	Dampening/monitoring (n = 4) Altering activation (n = 17) Altering pleasantness (n = 20)	I sometimes do relaxation exercises. (Nancy, Calm)
Reflection/reappraisal (n = 12)	Reframing of situation/life (n = 5) Reflection/thinking in depth (n = 6) Understanding cause of situation/mood (n = 3)	I try and put things in perspective. (Tracey, Calm)
Connectedness (n = 20)	Social (n = 20) Higher (n = 6) Gratitude (n = 10)	I . . . focus on helping others. (Alison, Happy)

Note. (n = X) refers to the number of transcripts within which the given theme/subtheme was identified.

constructs such as nature, religion or spiritual matters, and culture or beauty. The third subtheme we identified within the connectedness theme concerned *gratitude*, which had overlapped with the social and higher connectedness subthemes but also included non-specific thoughts of gratitude.

Discussion

We identified six broad themes and associated subthemes. Represented in these subthemes were a number of responses to positive states previously described in the literature, particularly within the context of the Broaden and Build theory (Fredrickson, 1998) and the literature on savoring (Bryant, 1989, 2003). According to the Broaden and Build theory, positive states allow individuals to temporarily expand their thought–action repertoire, for example, by engaging in exploratory behaviors or by savoring and integrating current experience: These tendencies are reflected in the *channeling*, *savoring*, and *reflection/reappraisal* themes, respectively. In addition to the *savoring* theme itself, the *reflection/reappraisal* and *connectedness* themes could be seen as reflecting aspects of savoring that accord with a broad definition of the construct, as could the *pleasantness* subtheme of mood management. In our analysis, we differentiated savoring from responses that appeared to be better described as seeking connection with others and with higher entities.

Despite overall congruence with previous influential accounts of response to positive mood, the *mood independence* and *altering activation* themes identified here do not sit comfortably within these frameworks. In the latter case, this may be because in addition to asking participants to reflect upon high valence states (enthusiastic and happy) we asked them to reflect on states of both very high (“active”) and very low (“calm”) activation, thus increasing the likelihood that participants would report strategies concerned with the management of activation levels. In addition, the established concepts of Broaden and Build and Savoring focus upon specific types of responses to positive states. Therefore, it would be expected that the current analysis, which seeks to capture a range of commonly occurring RPA, should identify additional themes.

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Study 2

The aim of Study 2 was to construct a reliable measure of response to positive mood, the items within which were drawn from the thematic categories identified in Study 1.

Method

Item development. Items were generated on the basis of the themes and subthemes identified. Where possible, paraphrased quotations from individual transcripts were used to construct items. Sufficient items were generated to allow a minimum set of four for each theme or subtheme or minor subtheme, to give a total of 105, of which 22 were reversed items.

A 4-point fully anchored Likert-type scale was presented with each item, where 1 = *almost never*, 2 = *sometimes*, 3 = *often*, 4 = *almost always*. Participants were given the following instructions:

The questions that follow ask about how you tend to respond when you are in a positive mood. Before you answer them, please bring to mind particular times when you were in a positive mood or felt good. These might be very recent times as well as

times longer ago. You might have felt good for a reason, or without knowing why. First we would like you to tell us which words best describe exactly how you felt during these times. Please tick as many sets of words as describes how you felt. If none describe how you felt, tick the closest one(s). At these times I felt . . . calm, at rest, placid, relaxed, quiet or serene (“calm”); happy, pleased, glad, satisfied, kindly or warmhearted (“happy”); enthusiastic, elated, excited, peppy (“enthusiastic”), lively or strong; active, alert, stimulated, determined or attentive (“active”). Now we would like you to tell us how much you tend to think and act in each of the ways listed below at times like these when you feel good. It’s important that you tell us about how you think and act once you are in a positive mood, rather than what puts you in a good mood in the first place. Also, we would like you to tell us how you actually think and act, rather than how you believe you ought to.

Participants. Participants were 540 individuals recruited from the general population and the undergraduate student population of the host institution. A total of 456 participants (84%) were recruited via two Internet-based sites that provide opportunities for volunteers to complete research studies online. In addition, 84 participants (16%) were students who were given the opportunity to participate in the study in one of two face-to-face testing sessions in exchange for course credit. The mean age of participants was 22.52 years ($SD = 10.95$, range = 18-74), and 116 (22%) were male. Details of nationality were provided by 256 participants: Of these 202 (79%) were North American, 24 (9%) were Asian, 53 (21%) were European, 5 (2%) were African, 20 (8%) were Central or South American, and 12 (5%) were Australian. English was the first language of 420 (92%) of the 456 who provided data on this.

Measures and procedure. The study was approved by the appropriate departmental ethics review board. After giving informed consent, participants completed the state version of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), a commonly used self-report measure of current mood state that assesses current levels of positive and negative affect separately. Participants also completed the Hypomanic Personality Questionnaire (Eckblad & Chapman, 1986): Findings pertaining to this measure are not reported here. Finally, participants completed the IRPAS.

Results

For the sample as a whole, mean PANAS Positive Affect subscale was 28.23 ($SD = 8.18$), whereas mean Negative Affect subscale score was 16.96 ($SD = 6.65$). These scores are within the range that would be expected from a non-clinical population (Watson et al., 1988).

Data were subjected to exploratory factor analysis using the principal axis factoring method. An oblique rotation (direct oblim, $D = 0$) was used as it was predicted that some of the constructs would be correlated. There were 24 factors

with eigenvalues greater than 1, accounting for 64.36% of the variance. Application of Cattell’s (1966) criterion to the scree plot of eigenvalues indicated that extraction of 12 or 13 factors would be appropriate. Parallel analysis based on 500 factor analyses of automatically generated random datasets revealed 12 factors with eigenvalues greater than the 95th percentile of eigenvalues produced from the random datasets. Therefore, a 12-factor solution was adopted.

To generate subscales for the IRPAS while reducing the total number of items in the scale from 105, we retained only items that had both high factor loadings (0.4 or above) and resulted in a decrease of the subscale alpha value when deleted. In addition, those items loading substantially on more than one factor were eliminated, giving a maximum of seven items per subscale and a minimum of 3 (one factor contained only two items that loaded substantially upon it and was therefore not included as a subscale). The resulting scale comprised 11 subscales and 59 items. Table 2 displays the retained items constituting each subscale, with details of the subscale title, factor loadings, alpha value, mean (SD), minimum and maximum for each subscale. While some subscale titles were drawn directly from Study 1, in some cases, it was necessary to generate new titles to best capture the subscale content. In general, internal consistency values for the subscales were found to be adequate, with lower values potentially reflecting the small number of items in some subscales.¹ For all subscales, participant scores were distributed along the full range of possible scores. Scores were left skewed for two subscales (Dampening and Stimulating) reflecting a tendency for participants to endorse lower rates of these responses; however, standard deviations of scores on these subscales were comparable with those obtained for subscales with the same number of items.

Bivariate correlational analyses were used to explore the relationships between the 11 subscales. Details of these correlations are given in Table 3. In general, the subscales showed low to moderate positive correlations with one another, with the exception of the Dampening subscale which showed some negative correlations with other subscales, and the Stimulating subscale which showed low correlations with the majority of subscales other than Dampening, with which it was moderately positively correlated.

Relationship between subscale scores and other variables. A small positive correlation was found between age and Gratitude score, $r = .11$, $p = .011$. Small negative correlations were found between age and Savoring, $r = -.12$, $p = .006$, Activating, $r = -.23$, $p < .001$, and Avoiding, $r = -.20$, $p < .001$, scores.

Current level of positive affect was found to have small to moderate positive correlations with all subscales other than Dampening and Stimulating, correlations with which were negligible (see Table 3). Current level of negative affect was found to have small positive correlations with

Table 2. IRPAS Subscale Constituents, Internal Consistency, and Test–Retest Reliability Values.

Subscale title (α value; intraclass correlation coefficient)	Item	Factor loading	M (SD)
Gratitude (.90; .64)	I give thanks for what I have	.866	2.90 (0.74)
	I think about how grateful I am	.804	
	I think about how lucky I am	.788	
	I count my blessings	.779	
Dampening (.84; .69)	I think that I am a fortunate person	.666	1.69 (0.56)
	I criticize myself	.629	
	I dwell on my current worries	.615	
	I let off steam by fighting or arguing	.611	
	I punish myself	.584	
	I think about upsetting topics or memories	.530	
	I try to push my feelings away	.523	
Stimulating (.80; .87)	I vent my feelings by being aggressive to others	.508	1.55 (0.66)
	I drink caffeine or smoke to perk myself up	.833	
	I give myself a lift by having a cigarette or a cup of coffee	.726	
	I take substances that pep me up	.701	
Higher Connectedness (.81; .77)	I take drugs that give me a high	.614	2.42 (0.60)
	I nourish my connection with beauty or nature	.622	
	I spend time contemplating nature	.592	
	I think in depth about the world	.567	
	I take time to admire art or music	.498	
	I reflect on life	.463	
	I ponder on the big questions in life	.445	
Channeling (.82; .69)	I look at myself or the world in a new way	.408	2.65 (0.56)
	I try harder to succeed at what I'm working on	.784	
	I make an extra effort to achieve the goal I am working toward	.690	
	I focus my energy into succeeding at what I am doing	.685	
	I tackle a new project	.564	
	I take advantage of the way I am feeling to get more done	.462	
	I do what has to be done regardless of my mood	.433	
Helping (.74; .65)	I set my sights on bigger things despite the risks	.425	2.80 (0.60)
	I try to help other people	.570	
	I nurture other people	.501	
	I think about how best to care for other people	.500	
Analyzing (.80; .59)	I am more co-operative with others	.404	2.35 (0.66)
	I try and understand what led me to feel this way	.850	
	I think about the causes of my current mood	.736	
	I analyze the situation that caused me to feel this way	.690	
	I keep an eye on my mood	.476	
	I think about what might happen as a result of my current mood	.464	
	I sit back and enjoy how I feel	.540	
Savoring (.86; .64)	I just enjoy the way I feel	.533	2.93 (0.59)
	I savor the moment	.507	
	I relish the experience	.480	
	I immerse myself in the present moment	.440	
	I do things that make me happy	.424	
	I smile or laugh more	.400	
	I exercise or do sport to burn off energy	.741	
Activating (.75; .73)	I energize myself by doing something physically active	.684	2.18 (0.74)
	I do something that gives me an adrenaline rush	.451	
	I avoid doing unpleasant tasks	.742	
Avoiding (.76; .60)	I put off things that will make me unhappy or stressed	.659	2.55 (0.58)
	I try not to think about things that upset me	.516	
	I keep my mind away from unpleasant topics	.487	

(continued)

Table 2. (continued)

Subscale title (α value; intraclass correlation coefficient)	Item	Factor loading	M (SD)
Calming (.68; .69)	I avoid thinking about my worries	.472	2.26 (0.56)
	I stay away from people who will bring me down	.415	
	I do something relaxing	.555	
	I have a rest	.530	
	I seek out peace and quiet	.448	
	I surround myself with people or things that are calming	.433	

Note. Subscale scores are the mean of scores on each constituent item. For all subscales, min = 1, max = 4 other than Dampening where max = 3.43. None of the final item sets are reverse-scored. Brief definitions of subscales are as follows: Gratitude: giving thanks for one's situation; Dampening: behaviors likely to decrease positive affect; Stimulating: ingestion of substances likely to increase physiological arousal; Higher Connectedness: relating oneself to greater abstract entities; Channeling: directing effort toward achieving goals; Helping: caring for or cooperating with others; Analyzing: thinking about the causes, meanings, and consequences of current mood; Savoring: enjoying the present moment; Activating: engaging in physical activity; Avoiding: avoiding potential triggers of negative mood; Calming: engaging in behaviors likely to decrease activation.

Table 3. Pearson's Correlation Coefficient Values for Relationships Between IRPAS and PANAS Subscales.

	Gr	Da	St	Hi	Ch	He	An	Sa	Ac	Av	Calming
Gr		-.26***	-.10*	.38***	.38***	.42***	.25***	.53***	.23***	.25***	.15***
Da			.34***	.04	.02	-.01	.19***	-.44***	.07	-.18***	.24***
St				.16***	.02	.01	.08	-.07	.08	.02	.07
Hi					.36***	.27***	.37***	.36***	.21***	.10*	.33***
Ch						.37***	.27***	.39***	.37***	.12**	.23***
He							.32***	.30***	.12***	.14**	.29***
An								.21***	.21***	.12**	.31***
Sa									.31***	.37***	.08
Ac										.09	.18***
Av											.10*
PANAS Positive Affect	.32***	-.0	.02	.28***	.35***	.18***	.26***	.22***	.24***	.10*	.22**
PANAS Negative Affect	-.22***	.38***	.19***	-.01***	-.15**	-.11*	.10*	-.24***	.00	.04	.03

Note. Gr = Gratitude; Da = Dampening; St = Stimulating; Hi = Higher Connectedness; Ch = Channeling; He = Helping; An = Analyzing; Ac = Activating; Av = Avoiding; Sa = Savoring; PANAS = Positive and Negative Affect Schedule. Sample size range = 532-534.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Analyzing and Stimulating, a moderate to large positive correlation with Dampening, and small to moderate negative correlations with Helping, Savoring, Channeling, and Gratitude.

Relationship between subscale scores and referenced mood state. Of the whole sample, 212 (39.3%) endorsed only one of the four positive mood types, 135 (25%) endorsed two mood types, 101 (18.7%) endorsed three mood types, and 62 (11.5%) endorsed four mood types, while 29 (5.4%) did not endorse any mood states. Overall, 181 (33.5%) described their mood as calm at the time(s) they were thinking of when completing the IRPAS, 358 (66.3%) described their mood as happy, 281 (52%) described their mood as enthusiastic, and 213 (39.4%) described their mood as active.

Data from the 212 participants endorsing only one mood state were used to explore associations between referenced mood state and IRPAS subscale scores. Four MANOVA models were constructed, with the 11 subscales of the IRPAS as dependent variables, and presence of calm, happy,

enthusiastic, or active mood state (yes/no) as the independent variable. A conservative alpha value of .01 was applied to reduce the likelihood of Type 1 errors due to multiple testing. The overall model was significant for active mood only, $F(11, 183) = 2.87$, Wilk's $\Lambda = .98$, $p = .002$. Within this, those referencing active mood reported greater levels of higher connectedness and channeling than those who referenced other states, Higher Connectedness: active absent $M = 2.33$, $SD = 0.57$, active present $M = 2.55$, $SD = 0.62$; Channeling: active absent $M = 2.58$, $SD = 0.55$, active present $M = 2.76$, $SD = 0.57$.

Correspondence between factor structure and thematic framework. All themes identified in Study 1 were represented separately within the factor structure revealed in Study 2, with the exception of "Mood Independence," items from which were subsumed under "Channeling." We considered the only underrepresented subthematic area to be two minor subthemes within the "connectedness—social" subtheme, namely "sharing emotion" and "communication,

interaction, closeness.” Correspondence between findings from Studies 1 and 2 is given within supplementary material.

Discussion

Factor analysis of items derived from the findings of Study 1 resulted in a 59-item scale containing 11 subscales, with adequate internal consistency. Scores on the resulting subscales spanned the full range of each subscale, and standard deviations were broadly comparable across subscales of equivalent item number, supporting the potential of the subscales to capture variability between respondents in their response styles. Scores on the Dampening and Stimulating subscales were left skewed, indicating that for many participants, these response styles do not reflect their typical behavior, but that these scales may capture response patterns that characterize a minority. Scores on the majority of subscales were found to be associated with current mood state; however, because of the cross-sectional nature of this study, it would be premature to conclude that current mood state biases responses on the IRPAS.

Consistent with existing measures of response to positive mood, the IRPAS asked participants to report their typical responses to episodes of (general) positive mood. To characterize the states that participants were referencing when they completed the item set, we asked them to endorse any of four positive states. Each of the four states was endorsed by at least some of the participants, supporting the IRPAS as a measure developed from data applicable to a broad range of positive states. When individuals endorsing only one state were compared with one another in terms of their scores on the IRPAS subscales, only active mood was found to be associated with a distinct response profile, suggesting that active positive mood in particular may lead to specific behavioral responses less common in other positive mood states, and potentially with different implications for subsequent affect. However, this comparison was limited by the inclusion of only a subset of the whole sample and its non-randomized design, whereby referenced mood state is likely to be confounded with individual differences. To explore definitively the relationship between referenced mood state and response profile, future studies might randomize individuals to call to mind one of a number of positive states while completing the measure.

Study 3

Test-retest reliability and convergent and divergent validity of the IRPAS were investigated among two further samples. In terms of assessing the validity of the IRPAS, we selected the three measures most closely related to the IRPAS conceptually, namely the Response to Positive Affect (RPA; Feldman et al., 2008) scale, the positive emotion regulation subscales of the ERP-R (Nélis et al., 2011)

and the WOSC (Bryant & Veroff, 2007). Predictions regarding convergent validity were made on the basis of conceptual overlap between particular WOSC, RPA, ERP-R, and IRPAS subscales, where conceptually equivalent subscales existed across measures.

Because the three existing scales focus broadly upon savoring and dampening strategies, we sought to explore overlap between these existing subscales and the most closely related subscales of the IRPAS. In addition, the IRPAS includes a “gratitude” subscale which is also present as a specific savoring subscale within the WOSC. Thus in terms of convergent validity, significant positive correlations were predicted between (1) IRPAS savoring and the closest equivalent subscales assessing savoring in the other measures, namely WOSC absorption, RPA emotion focus, RPA self-focus, ERP-R savoring total score; (2) IRPAS gratitude and its equivalent, WOSC blessings; (3) IRPAS dampening and the closest equivalent subscales in the other measures, namely WOSC killjoy thinking, RPA dampening, ERP-R dampening total score.

The following prediction was made regarding divergent validity. It centers upon divergence between the IRPAS Dampening subscale and the Savoring (or non-Dampening) subscales of the WOSC, RPA, and ERP-R because the former is the only IRPAS subscale to attempt to measure responses likely to *decrease* mood valence, therefore should not be positively correlated with subscales measuring responses that up-regulate positive mood. (4) IRPAS Dampening will have negligible or negative correlations with WOSC, RPA, and ERP-R subscales other than WOSC killjoy thinking, RPA dampening, and ERP-R dampening total. Finally, given that the IRPAS is designed to encompass savoring and dampening strategies but not to be limited to these, and should also encompass strategies relevant to a range of positive states, it was predicted that (5) the IRPAS would appear to make a novel contribution to the measurement of positive emotion, evidenced by at least some of its subscales (excluding those already mentioned in predictions 1-4) having low to negligible correlations with all WOSC, RPA, and ERP-R subscales.

Method

Participants. For both studies, samples of more than 84 were required to detect a moderate effect size ($R = .3$) with $\alpha = .05$ and power = .80. Participants in the first sample were 102 students who gave written informed consent to participate in the study as part of a practical class and in exchange for course credit. The mean age of participants was 20.23 ($SD = 5.26$) and 20 (20%) were male. Participants in the second sample were 116 students who gave written informed consent to participate in the study as part of a practical class. The mean age of participants was 19.14 ($SD = 3.04$) and 19 (17%) were male.

Measures

WOSC. The WOSC (Bryant & Veroff, 2007) is a 60-item self-report questionnaire, whereby participants indicate on a 7-point scale to what extent each item describes how they typically respond to positive mood. The WOSC contains 10 subscales: Sharing With Others, Memory Building, Self-Congratulation, Comparing, Sensory-Perceptual Sharpening, Absorption, Behavioral Expression, Temporal Awareness, Counting Blessings, and Killjoy Thinking.

RPA scale. The RPA (Feldman et al., 2008) is a 17-item self-report measure developed to assess levels of ruminative and dampening RPA, with items rated on a 4-point scale of typical response frequency. It contains three subscales: Self-Focused Positive Rumination (rumination on self and personally relevant goals), Emotion-Focused Positive Rumination (rumination on mood and somatic experiences), and Dampening (thoughts likely to dampen positive mood). It has been found to show acceptable levels of internal consistency, and it predicted patterns of associations with depressive rumination, self-esteem, and depressive and manic symptoms.

ERP-R. The ERP-R (Nélis et al., 2011) is a vignette-based self-report measure in which respondents must select one of eight reactions which would best reflect their response, for each of 15 scenarios, each depicting a different emotional experience (including both positive and negative emotions). Scores can be computed for both up- and down-regulation of both positive and negative emotions. In the current study, we considered the positive emotion regulation subscales. Up-regulation subscales include Behavioral Display (expressing positive feelings non-verbally), Savoring the Present Moment (directing awareness to current experience), capitalizing (communicating and sharing positive events with others), and Positive Mental Time Travel (remembering or anticipating positive events). Down-regulation subscales include Inhibition of Emotion Expression (suppressing positive emotions), Inattention (attending to activities other than the positive event), Fault-Finding (attending to the negatives of the event), and Negative Mental Time Travel (remembering negative aspects of the event or anticipating negative consequences connected with it). Evidence of divergent and convergent validity has been found for the ERP-R in relation to verbal skills and non-verbal reasoning, and emotional intelligence, respectively.

The IRPAS, described previously, was also included.

Procedure. The study was approved by the appropriate departmental ethics review board. Sample 1 completed the IRPAS at Time 1. At Time 2, which took place 1 month later, they completed the IRPAS and the WOSC, with the order of presentation being randomized across participants. Sample 2 completed the IRPAS, RPA, and ERP-R at one time point, with the order of administration being randomized across participants.

Results

Sample 1. To estimate test–retest reliability within Sample 1, the intraclass correlation coefficient (single rating value) scores for the 11 IRPAS subscales were calculated for Times 1 and 2, using a two-way random-effects model. This resulted in estimates of reliability ranging from .59 to .87 (see Table 2). Nine of the subscales showed “substantial” test–retest agreement; one showed “almost perfect” agreement, with only one (Analyzing) showing “moderate” agreement (Landis & Koch, 1977). Correlational analyses were conducted to explore relationships between subscales of the IRPAS and the WOSC (Table 4; both as measured at Time 2). Correlation coefficients ranged from $R = -.31$ to $R = .64$. A total of 17 correlation coefficients (15%) were of at least moderate strength ($R \geq .30$). To test predictions concerning convergent validity, a conservative alpha level of $p < .01$ was applied. As predicted, IRPAS savoring was significantly positively correlated with WOSC absorption, IRPAS gratitude was significantly positively correlated with WOSC blessings, and IRPAS dampening was significantly positively correlated with WOSC killjoy thinking. To test the prediction concerning divergent validity, an alpha level of $p < .05$ was applied (the conservative approach being to maximize the likelihood of finding a significant association). Consistent with Prediction 4, IRPAS dampening was not significantly positively correlated with any WOSC subscale other than those predicted.

Sample 2. Correlational analyses were conducted to explore relationships between subscales of the IRPAS and the RPA and ERP-R (Table 4). Correlation coefficients ranged from $R = -.31$ to $R = .54$. A total of 10 correlation coefficients (7%) were of at least moderate strength ($R \geq .30$). As predicted, IRPAS savoring was significantly positively correlated with RPA emotion focus, RPA self-focus, and ERP-R savoring total. Also as predicted, IRPAS dampening was significantly positively correlated with RPA dampening and ERP-R dampening total. It was also significantly positively correlated with one of the ERP-R subscales contributing to dampening total score, Fault-Finding. Consistent with Prediction 4, IRPAS dampening was not significantly positively correlated with any RPA or ERP-R subscales other than those predicted.

To address the question of whether the IRPAS makes a novel contribution to the measurement of response to positive emotion (Prediction 5), we identified IRPAS subscales that did not correlate with other WOSC, RPA, or ERP-R subscales at least moderately ($R < .30$) in all cases. Three IRPAS subscales did not have such relationships with other subscales: Stimulating, Avoiding, and Calming.

Discussion

Examination of test–retest reliability for the IRPAS revealed this to be acceptable over a period of 1 month. Overall, the IRPAS was not highly correlated with any of the existing

Table 4. Pearson's Correlation Coefficient Values for Relationships Between Subscales of the IRPAS and the WOSC, RPA, and ERP-R.

	Sa	Gr	Da ^a	St	Hi	Ch	He	Ca	An	Ac	Av
Sample 1											
WOSC Sharing With Others	.32**	-.31**	-.02	.03	.32**	.16	.16	.05	.14	.27**	.17
WOSC Memory Building	.37***	.27**	-.04	-.04	.28**	.13**	.23*	.18	.14	.39***	.13
WOSC Self-Congratulation	.20*	.21*	-.03	.15	.23*	.20*	.11	.07	.11	.31**	.08
WOSC Comparing	.18	.21*	.08	.09	.29**	.13	.11	.14	.40***	.16	.04
WOSC Sensory-Perceptual Sharpening	.19	.13	.11	.14	.23*	.24*	.16	.06	.16	.34**	-.09
WOSC Absorption	.44**	.21*	-.25*	-.03	.33**	.12	.19	.22*	.05	.20*	-.02
WOSC Behavioral Expression	.21*	.19	-.14	-.01	.17	.03	.02	-.11	-.04	.22*	.05
WOSC Temporal Awareness	.06	.17	.07	-.11	.21*	.15	.19	.09	.27*	.19	.01
WOSC Counting Blessings	.51***	.64***	-.09	-.04	.40***	.29**	.33**	.13	.02	.38***	.00
WOSC Killjoy Thinking ^a	-.18	-.06	.30**	-.04	.05	.10	-.01	.06	.37***	-.03	.00
Sample 2											
RPA Self-Focus	.26**	.29**	-.13	-.06	.15	.43***	.11	.05	.11	.33***	.11
RPA Emotion Focus	.54***	.49***	-.28**	.06	.27**	.22*	.24*	.06	.10	.27**	.14**
RPA Dampening ^a	-.22*	-.05	.49***	.09	.22*	.16	.14	.25*	.27**	.11	-.11
ERP-R Inattention ^a	-.18	-.16	.20*	.09	.17	.09	-.02	.08	.07	.03	-.11
ERP-R Fault-Finding ^a	-.17	.14	.25	-.02	.23*	.02	.08	.09	.16	-.01	-.10
ERP-R Negative Mental Time Travel ^a	-.08	-.06	.19*	.20*	.18	-.05	-.01	.00	.05	-.04	-.06
ERP-R Inhibition ^a	-.02	-.08	.19*	.04	.30**	.05	.13	.19*	.04	-.03	-.02
ERP-R Behavioral Display	.19*	.09	-.36***	-.01	-.26**	-.05	-.09	-.11	-.05	-.12	.10
ERP-R Capitalizing	.20*	.10	-.39***	-.10	-.26**	.07	.02	-.06	-.09	-.01	-.05
ERP-R Savoring	.18	.10	-.43***	-.04	-.25**	.03	-.17	-.14	-.16	-.01	.10
ERP-R Positive Mental Time Travel	.28**	.12*	-.42***	-.16	-.13	.10	.08	.08	-.13	.09	-.01
ERP-R Total Savoring	.27**	.15	-.50***	-.10	-.28**	.05	-.05	-.07	-.13	-.01	.04
ERP-R Total Dampening ^a	-.13	.18	-.33***	.13	.31**	.06	.10	.20	.17	-.01	-.09

Note. Sa = Savoring; Gr = Gratitude; Da = Dampening; St = Stimulating; Hi = Higher Connectedness; Ch = Channeling; He = Helping; Ca = Calming; An = Analyzing; Ac = Activating; Av = Avoiding; WOSC = Ways of Savoring Checklist; RPA = Response to Positive Affect scale; ERP-R = Emotion Regulation Profile-Revised. Sample size range = 97-114.

^aSpearman's correlations conducted for all tests involving this subscale.

* $p < .05$. ** $p < .01$. *** $p < .001$.

measures, but a minority of relationships between scales were of at least moderate strength: This is to be expected, given that each measures a different but overlapping set of constructs.

Supportive of the convergent validity of the IRPAS scale, its subscales showed the expected pattern of associations with subscales of the three other measures. Supportive of the divergent validity of the IRPAS, the Dampening subscale was positively associated only with subscales from the other measures addressing dampening.

While these findings are encouraging, this study is limited as a comprehensive assessment of IRPAS validity. Conceptual overlap between the IRPAS and the three existing measures used is not complete; therefore, we did not have a standard against which to assess some of the more novel subscales of the IRPAS. Second, while the measures we assessed the IRPAS against are used in contemporary research, none of these have been exhaustively validated. Therefore, we were not able to access a "gold standard" against which to validate our novel measure. Third, given that RPA may not occur in isolation from one another, convergence between pairs of subscales may reflect behaviors that tend to occur together,

rather than behaviors that are same in form and function. Fourth, although the ERP-R did differ methodologically from the IRPAS, all measures utilized self-report: Further research should seek to validate the IRPAS against behavioral measures of response to positive mood. Finally, our sample was composed of University students, of whom the majority were young adults, despite items having been generated from a study conducted with an older sample. Validity in older, non-student samples requires investigation. Importantly, it appears that the IRPAS measures some constructs not addressed by the WOSC: Three IRPAS subscales showed low to negligible correlations with all WOSC, RPA, and ERP-R subscales. This may reflect two intentional differences between the IRPAS and the other three scales. First, the latter scales are intended as more in-depth measures of responses that up- or down-regulate positive mood, whereas the IRPAS is intended to include responses that may not have a direct regulatory effect. Second, the content of the IRPAS is informed by individuals' reports of response to a variety of positive mood states and may therefore capture strategies, such as "calming," that may not be relevant to the affective states referred to by existing measures. Thus, the measures

complement one another and can be selected according to the particular research question.

General Discussion

Items in the IRPAS were constructed on the basis of findings from interviews with members of the general public, combined with concepts from the extant literature. The resulting set of subscales were found to have adequate internal consistency and test–retest reliability, and to show the expected pattern of associations with subscales of existing measures of similar constructs.

The IRPAS appears to measure some constructs not addressed by the other measures investigated, suggesting that it has the potential to make a novel contribution to the investigation of the regulation of positive emotion. Study 3 demonstrates empirical divergence between the Calming, Stimulating, and Avoiding subscales and those of the WOSC, RPA, and ERP-R; they also diverge theoretically, in that Stimulating and Calming appear to reflect responses likely to follow increases in activation in particular, whereas the measures investigated are largely concerned with management of the valence rather than the arousal dimension of positive mood. This may rest in part upon the approach taken in the development of the IRPAS, whereby items were designed to capture responses to a range of different positive states, including high and low activation positive states. On this basis, we would predict that scores on these IRPAS subscales would not correlate strongly with the scores on the subscales of a recent instrument, the PEARS (Gentzler et al., 2015), which measures aspects of savoring and dampening. Theoretical divergence of the IRPAS from these instruments is also present with regard to the concept of “Channeling,” whereby individuals do not engage in behaviors that function to up- or down-regulate positive mood but instead use this mood as an opportunity to achieve goals, and “analyzing” whereby the individual seeks to understand the causes, meanings, and consequences of his or her mood. It may be that these constructs are captured within the “Betterment” subscale of the IPERS (Livingstone & Srivastava, 2012). The IPERS also contains a subscale (Indulgence) that makes reference to substance use and as such may overlap empirically with the Stimulating subscale. Future research should explore the relationship between the IRPAS, IPERS, and PEARS.

Although the IRPAS was designed to capture a range of responses to positive mood, it cannot be considered to be comprehensive. Nevertheless, in Study 1, thematic saturation was reached by Participant 7 of 21, suggesting that, in this sample at least, response repertoire was relatively generalizable across individuals, supporting the wider applicability of this framework. In terms of its applicability to different types of positive emotions, we assessed states located at four locations on a dimensional model of affect. Future studies could explore whether the IRPAS appears to reflect typical

responses to discrete emotions such as awe, amusement, and compassion. While the IRPAS is intended as a trait measure, albeit concerning state-based responding, the current study revealed correlations between participants' current mood and IRPAS responses. As such, further research is needed to characterize the extent to which the IRPAS reflects trait versus state-related behavioral tendencies.

The IRPAS was developed based on data from primarily female samples. Given that men and women may differ in the use of some emotion regulation strategies (Gross & John, 2003), we cannot exclude the possibility that, during item development, we failed to discover constructs that are of unique relevance to male individuals due to our sample characteristics. Validation of the IRPAS was conducted in samples of (primarily) young adults in University education; therefore, further research is needed to estimate its properties in older, non-student populations. This may also allow investigation of developmental trajectories of both positive affect experience and response profiles, something that was not taken into account in the thematic analysis within the current study. Furthermore, response to and displays of positive emotion are likely to be influenced significantly by social and cultural background and context. While the limited data we obtained indicate that the sample of individuals in our factor analytic study was fairly diverse in terms of nationality, this information was neither complete nor reliable enough to permit examination of differences in response to positive emotion in relation to cultural or social factors. Future work should aim both to characterize participants in terms of these factors and to investigate the validity of the IRPAS cross-culturally.

Further exploration of the validity of the IRPAS should include tests of predictive validity, for example, correlating subscale scores with behavior post laboratory positive mood induction or during real-life instances of positive mood via experience sampling studies. Examples of dependent variables include tendency to invest energy in goals and challenges (“channeling”) and tendency to opt to help others (“helping”). Tests of predictive validity could also include investigating the extent to which IRPAS scores predict or are predicted by presence of psychological disorders or difficulties, based on theoretical understandings of positive affect regulation in these conditions. For example, individuals with bipolar disorder would be expected to show higher rates of behaviors that increase activation levels once in a positive mood, such as activating, and that involve the pursuit of goals, such as channeling (see Mansell & Lam, 2006).

The IRPAS deliberately does not discriminate between behaviors that arise as an intrinsic part of the emotional response (such as approaching goals when enthusiastic) and those that represent attempts to regulate affect: We consider this necessary to look beyond behavioral responses that are concerned only with modifying affect directly. Furthermore, such an approach allows for between- and within-individual variation in the function of these behaviors. Nevertheless,

future development of the IRPAS might seek to test its properties as a measure of either intrinsic response or regulatory attempts by, for example, asking the same individuals to complete two versions of the measure, differing only in whether they ask respondents to focus upon naturally arising or deliberate responses.

In terms of its potential applications, the IRPAS may contribute to research into theories of positive affect response. For example, Fredrickson's (1998) Broaden and Build model suggests that we may use positive states as a platform from which to reach our goals, thus creating further positive mood. The IRPAS provides a means of exploring the behaviors that facilitate this, within one measure (and potentially in combination with others). In particular, the Channeling subscale could be used to explore "building" via goal-focused behavior when in positive mood, while the Helping subscale (and Social Expressive subscales in other measures) might reflect strategies for building social capital. In contrast, one might predict that an avoidant response style to positive mood (as measured by the novel Avoiding subscale) may allow less opportunity for the individual to build external and relational resources, and thus be associated with less positive outcomes over the medium to long term. As previously mentioned, dysregulation of positive emotion regulation processes may contribute to some psychological disorders. Studies in this area to date have tended to use measures that focus on particular response styles to positive states, such as savoring and rumination (e.g., Johnson, McKenzie, & McMurrich, 2008), and in doing so have revealed differences between clinical and non-clinical samples. The IRPAS allows exploration of the specificity of these effects as it can investigate which of a range of response styles are altered. In doing so, it could contribute to a picture of the broader profile of response to positive affect associated with a given disorder. In conclusion, we have described the development of a novel measure of response to positive mood, which has potential to contribute to research into positive emotion regulation in both clinical and non-clinical populations.

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Authors' Note

Tamsin Armstrong is now in the Republic of Singapore.

Declaration of Conflicting Interests

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Note

1. Factor structure and content remained unchanged following factor analysis of the final item set with the exception of "Stimulating," which split into two factors both containing two items. Items in the first of these factors showed substantial loadings on the second; therefore, the original Stimulating factor was retained. To investigate the extent to which the factor structure is robust across subsamples, we repeated the analyses, excluding the 84 participants who completed the study face to face. The structure and content of factors was largely replicated, with the exception of an additional factor originally subsumed under "channeling."

Supplemental material

The online data supplements are available at <http://sgo.sagepub.com/supplemental>.

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