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Emotional dimensions reflected in ratings of affective scripts

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Abstract

Emotion theories can be divided into those that propose either the existence of discrete emotions, or of basic dimensions describing affective space. Recent theories propose a hybrid of these. This study examines ratings of emotional scripts with the prediction that these would fit a hybrid theory. The effect of trait positive and negative affectivity on the perception of affective materials is also assessed. Scripts were rated on valence, arousal, dominance and affect orientation, and on the presence of basic emotions. Factor analyses and multidimensional scaling supported largely that emotional responses reflected the basic dimensions of valence and arousal but that scripts could also be classified into specific emotion categories, indicating that a hybrid model may be most appropriate.

Keywords: Emotion; Circumplex model; Valence; Arousal

1. Introduction

Categorical theories of emotion argue for the presence of basic, distinct emotions, e.g. fear and anger, that produce different physiological responses. Supporting evidence includes findings that some emotions exist universally and carry adaptive value (Plutchik, 1980), and of distinct response patterns among emotions (e.g. Levenson, 1988). Arguments against categorical theories, (Russell, 2003) suggest that there is no biological basis to discrete emotions at all, which

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are instead mental schemata, with fuzzy boundaries, based on linguistic and cultural experience. Ortony and Turner (1990) furthermore point to the wide disagreement among theorists on how many basic emotions exist, which suggests that these are indeed linguistic taxonomic categories and not emotions themselves. They further argue that no neural circuits corresponding to distinct emotions have been identified, but rather ones corresponding to basic response systems shared by various emotional states (Panksepp, 1982). These response systems may underlie the distinct facial expressions and physiological responses that have fueled categorical approaches. For example, muscle tension may signify action readiness, correlated with several states and not just anger (Ortony & Turner, 1990).

The alternatives to categorical theories are the dimensional approaches including the circumplex model (Russell, 1980; Russell & Mehrabian, 1977). Russell (2003) argues that conscious experience reflects the blend of two core dimensions, valence and arousal representing pleasantness (hedonic tone) and excitation (intensity). These exist at a primitive level, not requiring cognition or attribution. Russell, Lewicka, and Nitt (1989) studied classification of emotional words in 4 cultures and found that the circumplex model is valid cross-culturally (Russell, 1983). It is also robust in studies examining self-reported emotion, (Barrett & Russell, 1999; Sjoberg, Svensson, & Persson, 1979; Yik, Russell, & Barrett, 1999). Core affect, however, isn't enough for conscious emotions. Russell suggests that during an emotional "experience", i.e. when we recognize that we are afraid or happy, core emotion (dimensional) is attributed to an object and corresponding actions are initiated. Subjective experience begins and is labeled according to an emotion category (e.g. fear), a process called "emotional meta-experience". Thus, though core affect exists along basic dimensions, the *experience* of emotion is essentially categorical.

Factor analysis with unrotated factor solutions (Cropanzano, Weiss, Hale, & Reb, 2003) have revealed two alternative orthogonal dimensions, Positive and Negative Affectivity, (Watson & Tellegen, 1985), which actually represent the same affective circumplex rotated 45° relative to valence and arousal. Thus, high PA emotions represent combinations of high arousal/positive valence and high NA emotions represent high arousal/negative valence. Recently, a novel dimension, affect orientation (AO), was proposed, indicating the degree to which emotion leads to action-orientation or reflection and withdrawal (Green & Sedikides, 1999). Sedikides (1992) suggests that action oriented emotions, such as fear (fleeing) or happiness (approach) decrease self-consciousness because the implied action is apparent. To the contrary, emotions such as boredom represent vague action tendencies and lead to a search for appropriate responses.

Although quite dominant, the dimensional approach is not completely satisfactory. It places closely together in affective space, emotions commonly perceived as discrete. One example is anger and fear, which have clearly different facial expressions and action tendencies of fight and flight respectively, but are both high arousal/negative states (Larsen & Diener, 1992). Such limitations have prompted the development of hybrid theories (e.g. Christie & Friedman, 2004; Levenson, 1988). These suggest that discrete emotions represent specific points in dimensional space so that similar emotions are adjacent, but can also be identified as unique, due to categories formed through language and culture (Russell, 2003).

This study examines ratings of emotional scripts with the prediction that a hybrid model would be supported: We expected that valence and arousal dimensions would explain most of the variance in the ratings, but that participants would also identify the specific emotional category within which each script belongs. A second goal was to examine how trait PA/NA affects the

perception of affective materials, anticipating that it would intensify valence ratings. A third goal was to test how AO fits with traditional dimensions in affective space. The study extends previous findings with affective adjectives (e.g. Barrett, 2004; Yik, Russell, Oceja, & Dols, 2000) using new materials and a non-English speaking sample. Although cross-cultural data with emotional words and mood ratings do support the circumplex model, no factor analytic cross-cultural research exists using emotional scripts.

2. Study 1

2.1. Method

2.1.1. Participants

Participants were 164 Greek Cypriot undergraduates who participated voluntarily or for extra credit. Because only ten were men gender was not examined as a variable. Ages ranged from 17 to 45 (mode = 19).

2.1.2. Measures and materials

Eighty-eight scripts previously used in English (see van Oyen Witvliet & Vrana, 1995 for details; Panayiotou, Robinson, Witvliet, & Vrana, 1995; Robinson & Vrana, 2000) were front and back translated into Greek. They represented 8 emotions: anger, fear, joy, disgust, pleasant relaxation, sadness, grief, and neutral. Anger, fear, disgust and grief were expected to be negative/high arousal, joy positive/high arousal, sadness negative/low arousal and pleasant relaxation to be positive/low arousal. Neutral was expected to be at the center of emotional space. To limit completion time, two forms of a questionnaire were created each representing 4 emotions: "study group 1" ($N = 100$), was given anger, fear, joy and sadness scripts whereas "study group 2" ($N = 64$) was administered the other 4. Scripts were administered to everyone in the same randomized order.

The first page of the questionnaire contained the positive affectivity, negative affectivity scale (PANAS; Watson, Clark, & Tellegen, 1988). Because this, to our knowledge, is the first time it was used with Greeks its validity was examined: bi-variate correlations showed, for study group 1, that the PA/NA dimensions were orthogonal. For study group 2, a marginal ($r = -24$, $p = .05$) correlation was observed. In an exploratory factor analysis (EFA) with varimax rotation, 42% of the variance was explained by two components and all items loaded on their appropriate factor.

2.1.3. Procedure

Participants were group-tested and instructed to rate how they would feel if each scenario actually happened to them. Ratings were on Likert-type scales for all dimensions. For the rating of emotional reactions the scale ranged from 1 = not felt at all, to 7 = felt very much. For valence, 1 = unpleasant, 7 = pleasant, for Arousal, 1 = calm, 7 = aroused, for dominance, 1 = out of control of events, 7 = in control of events, and for affect orientation (defined as the degree to which attention was focused toward the self or the environment) 1 = internal attention, 7 = external attention.

2.2. Results

2.2.1. Emotion differences

2.2.1.1. Dimensions. To examine differences in ratings among emotions the data were re-organized so that scripts were the cases, and a mean variable was calculated for each script, for each rating, across all participants (to allow comparison among all 8 emotions, in spite of different sample sizes and separate samples.) An 8 (emotions) × 10 (dimensions) analysis of variance revealed main effects of emotion, $F(7,800) = 50.75$, $p < .0001$, and dimension, $F(9,800) = 91.32$, $p < .0001$, and an emotion × dimension interaction, $F(63,800) = 36.91$, $p < .0001$. One-way ANOVAs broke down the effects for each dimension, with emotion as the grouping variable. Table 1 shows means and standard deviations for each dimension. Emotions were significantly different in valence, $F(7,87) = 536.38$, $p \leqslant .0001$, arousal $F(7,87) = 85.55$, $p < 0001$, dominance, $F(7,87) = 80.63$, $p \leqslant .0001$ and AO $F(7,87) = 14.34$, $p \leqslant .0001$.

Fig. 1 depicts the placement of the 88 scripts in affective space based on valence/arousal ratings. Emotions fit their expected quadrants, but notably sadness was not placed in the negative/low arousal quadrant since it was rated as arousing.

2.2.1.2. Specific emotional reactions. Significant differences were identified in all emotional reactions as follows: fear, $F(7,87) = 41.85$, $p \leqslant .0001$, joy, $F(7,87) = 692.90$, $p \leqslant .0001$, anger $F(7,87) = 100.49$, $p \leqslant .0001$, sadness $F(7,87) = 139.50$, $p \leqslant .0001$ and disgust $F(7,87) = 57.78$,

Table 1
Means and standard deviations (parentheses) of ratings for emotions in study 1

	Anger	Fear	Joy	Sadness	Disgust	Grief	Pl. relaxation	Neutral
Valence	1.60	1.60	6.30_a	1.76_b	1.40_b	1.21_b	4.42_a	5.02_b
	(.75)	(.76)	(.95)	(.76)	(.33)	(.77)	(.63)	(.92)
Arousal	5.98_a	6.15_a	4.66_b	5.06_b	5.88_a	6.44_a	1.75_c	2.59_c
	(.91)	(.95)	(1.30)	(.97)	(.92)	(.85)	(.68)	(.82)
Dominance	3.13_b	2.88_b	5.51_a	3.12_b	3.27_b	2.39_b	6.11_a	5.88_a
	(1.01)	(1.03)	(.97)	(1.20)	(1.22)	(1.22)	(.95)	(1.05)
Orientation	3.75_b	3.65_b	4.84_a	3.59_b	4.17_a	2.76_{bc}	2.85_{bc}	3.44_b
	(1.20)	(1.37)	(1.27)	(1.18)	(1.36)	(1.21)	(1.36)	(1.38)
Fear	2.95_a	6.06_b	1.53_c	3.52_b	3.66_b	5.85_a	1.15_c	1.23_c
	(1.07)	(.93)	(.60)	(1.06)	(1.22)	(.86)	(.30)	(.35)
Joy	1.27_c	1.20_c	6.30_a	1.28_c	1.55_c	1.07_c	5.69_b	3.93_c
	(.50)	(.29)	(.73)	(.44)	(.27)	(.198)	(.89)	(1.11)
Anger	6.21_a	4.19_b	1.27_b	4.00_b	4.70_b	5.37_a	1.09_b	1.30_b
	(.87)	(1.46)	(.56)	(1.27)	(1.28)	(1.42)	(.212)	(.43)
Sad	5.32_a	4.33_b	1.27_c	5.98_a	4.01_b	6.66_a	1.22_c	1.40_c
	(1.13)	(1.48)	(.52)	(.86)	(1.45)	(.72)	(.51)	(.53)
Disgust	3.56_b	3.33_b	1.16_c	2.20_c	6.22_a	1.85_c	1.02_c	1.07_c
	(1.56)	(1.15)	(.46)	(1.23)	(.59)	(1.08)	(.11)	(.18)
Surprise	5.53_a	5.22_a	4.81_a	3.51_b	6.21_a	5.36_b	1.48_b	1.58_b
	(1.13)	(1.36)	(1.10)	(1.32)	(.59)	(1.42)	(.68)	(.71)

Note: Means in the same row that do not share a subscript differ at $p < .05$ using the Bonferroni correction.

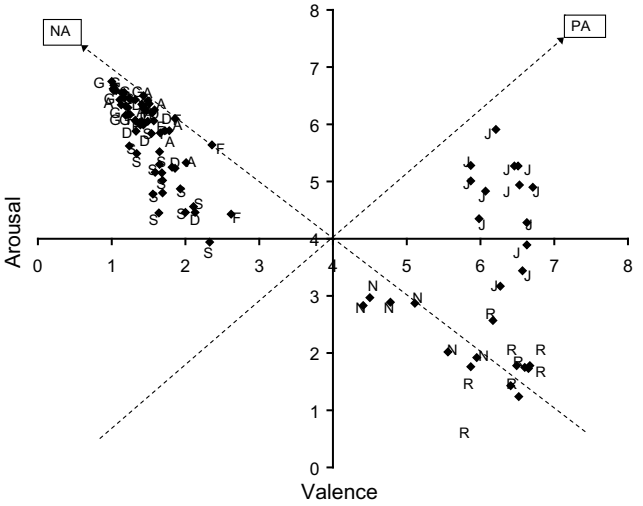

Fig. 1. Placement of scripts of study 1 in affective space based on valence and arousal ratings. Scripts belonging to specific categories are represented by the capital initials of anger, joy, sadness, fear, disgust, relaxation and neutral.

$p \leqslant .0001$ (see Table 1). Largely, the highest ratings of specific emotional reactions were given to the scripts that fit that category, supporting that scripts could be placed in distinct linguistic taxonomies. However, neighboring emotions, based on valence/arousal, also received high ratings of the specific emotional reaction (i.e. anger received the highest anger ratings but fear and disgust were also rated as producing high anger), suggesting that scripts are perceived as similar because of common dimensional characteristics.

2.2.2. Correlations among dimensions

According to the circumplex theory, valence and arousal are orthogonal, while additional dimensions correlate with one or the other of these axes. Mean dimension scores were obtained across all emotions and bi-variate correlations were calculated. Valence was unexpectedly correlated with arousal, $r = -.29$, $p \leqslant .01$, dominance with valence, $r = .45$, $p \leqslant .01$ and arousal, $r = -.21$, $p \leqslant .01$, and AO (external attention) with high arousal, $r = .26$, $p \leqslant .01$.

For AO, the obtained correlation with arousal is contrary to prior findings, which had suggested that arousing, negative emotions produce the most internal attention (Panayiotou, Brown, & Vrana, 2007). Therefore targeted correlations were calculated between AO and the other dimensions *within* each emotion. Results showed that the association between external attention and high arousal was specific to disgust ($r = .31$, $p < .05$). Instead, within fear and joy, external attention was associated with dominance ($r = .21$, $p < .05$, and $r = .45$, $p < .01$, respectively) and within joy additionally with positive valence ($r = .36$, $p < .01$).

2.2.3. Factor analysis

Mean ratings on the 10 dimensions were subjected to unrotated principal components EFA. Individual scripts were the unit of analysis (88 cases). This yielded two factors, explaining

81.35% of the variance (KMO = .80; factor 1, 66.28% of variance). All dimensions, except AO loaded on factor 1 (>.30). Loadings were positive, except for valence, dominance, and joy. Thus, valence, dominance, and joy may represent the positive pole, while ratings of (high) arousal, anger, fear, and sadness (which are inter-correlated) may represent the negative pole of valence. Factor 2 contained AO, disgust, surprise and arousal. Given the correlation between AO, arousal and surprise, and also the fact that disgust was rated as highly arousing, this factor roughly represents arousal.

2.2.4. Factor analyses within dimensions

EFAs were also conducted for study group 1 within each rating dimension, with participants as the cases, and the 88 scripts as the variables to be factorized. It was hypothesized that specific emotion categories would emerge.

2.2.4.1. Valence. The EFA revealed 15 factors (75% of the variance) but the scree plot supported two components. The first, (24% of the variance) included 30 fear, anger, and sadness items (and 1 negatively loading joy item). The second included 10 joy items (and 3 sadness, which loaded primarily on subsequent factors) and explained 10% of the variance.

2.2.4.2. Arousal. Fourteen components were extracted (75% of variance) but 3 were supported by the scree plot (38% of variance). The first component contained 25 fear, anger and sadness items (plus 3 joy items with cross-loading on subsequent factors.) The second contained 9 joy items, and the third, 4 sadness items and a joy item. An additional EFA was conducted with a constrained 2-factor solution on the items of the 2nd and 3rd factor (and a fourth with 2 sadness and an anger item), to test whether the two principal components had been fragmented. This grouped all negative items together and joy items separately revealing a very similar pattern as in the case of valence.

2.2.4.3. Dominance. For dominance, 26 sadness, fear and anger items loaded factor 1, and 11 joy items loaded on factor 2, which collectively explained 30% of the variance. In sum, within valence, arousal and dominance scripts were grouped based on two poles, negative and positive, of the valence dimension.

2.2.4.4. Affect orientation. This EFA revealed two somewhat different factors (32% of the variance). The first contained 25 items fear and anger and 4 sadness, plus 3 joy items. The second contained 12 items, 6 sadness (positive loadings) and 6 joy (negative loadings) and can be viewed as reflecting valence. The first factor was scrutinized by examining the valence and arousal means of each item. It contained 6 of the most arousing fear, anger (5), sadness (2), and joy (3) items. The rest of the top six arousing items in each emotion also loaded on this factor, which seems to reflect arousal.

2.2.5. Association between negative and positive affectivity and emotional reactions

PA/NA groups were formed by splitting the distributions of PA/NA on the median and comparing the two extreme groups, i.e. those high on PA but low on NA (high positives) and those

high on NA and low on PA (high negatives), on their ratings. There were no significant differences except for the following: high negatives reported greater sadness in the joy, $F(1,22) = 9.00$, $p < .05$, and fear conditions $F(1,22) = 4.87$, $p < .05$, and marginally greater fear in the anger condition $F(1,22) = 4.08$, $p = .056$, compared to high positives. High positives reported significantly greater surprise in the neutral condition $F(1,30) = 5.01$, $p < .05$, more positive valence in the disgust condition $F(1,30) = 5.07$, $p < .05$, and marginally more sadness in grief $F(1,30) = 3.89$, $p = .058$. Correlations indicated that PA was positively correlated with affect orientation (external attention), $r = .27$, $p < .01$, while NA was correlated with negative valence, $r = -.29$, $p < .01$, and low dominance, $r = -.20$, $p < .05$.

2.3. Discussion

Ratings (Fig. 1) support that emotional space can be defined largely by valence and arousal. However, few scripts actually fell on these axes. Most were located in the center of their quadrant forming the PA/NA axes. Clear NA poles can be seen in the high arousal/negative quadrant and the low arousal/positive quadrant. Only one pole of the PA axis was represented by joy scripts. Because of the high arousal ratings given to sadness, the negative/low arousal quadrant remained empty. Thus both valence and arousal and PA/NA described ratings adequately as expected. Factor analyses supported the presence of two main components approximating valence and arousal, with the first factor explaining about twice the variance of the second, as found previously (Cropanzano et al., 2003).

The fact that participants gave higher ratings of specific emotions to the corresponding emotional condition (e.g. highest fear ratings to fear scripts) shows, in addition, that emotional materials, though perceived as similar in dimensions, can be placed in distinct categories. This is in accord with a hybrid theory (Russell, 2003) where core affect can meta-cognitively be labeled according to linguistic categories. Our prediction that factor analyses within each dimension would reflect specific emotions was not supported. Instead two factors emerged, which largely described the positive and negative poles of valence.

3. Study 2

A second study was conducted to conceptually replicate the findings. Scripts for each emotion category were selected based on their mean valence and arousal ratings in study 1 to best represent their quadrant. A more balanced design was achieved by including an emotion rating of pleasant relaxation. For simplification, only fear, anger and disgust were maintained in the high arousal negative quadrant with only 6 scenarios representing each of the 7 emotions. Multidimensional scaling was used to classify ratings instead of factor analysis to provide a better conceptual replication. For this purpose, another dimension was added where participants rated how much each script described their current mood, from "not at all" to "very much". It was expected that this would provide an implicit similarity rating among scripts, since similar emotions would be rated as equally fitting current mood.

3.1. Method

Methods and procedures were similar to study 1 except that all participants rated all scripts. The PA/NA measure was not included. Participants were 28 undergraduates (25 female).

3.2. Results

Table 2 presents means and standard deviations for each emotion. Because scripts that best fit their quadrant were selected, these were more evenly placed within affective space. Sadness was rated as less arousing this time. The highest ratings for AO were produced by pleasant relaxation and neutral: joy and sadness resulted in the most external attention. As expected all ratings of emotional reactions were highest for scripts that fit the particular category. Notably, when correlations among dimensions were calculated, arousal and valence were non-significantly correlated this time ($p > 1$).

Multidimensional scaling was conducted on rating of current mood. The analysis created distances between scripts and plotted them in Euclidean space. The one-dimensional solution yielded high normalized raw stress (=.09). The two dimensional solution substantially reduced stress to .02. Adding a 3rd dimension did not improve stress substantially (=.013) and did not result in

Table 2
Means and standard deviations (parentheses) of ratings for emotions in study 2

	Anger	Fear	Joy	Sadness	Disgust	Pl. relaxation	Neutral
Valence	1.36	1.36	6.50	1.67	1.15	6.27	4.48
	(.21)	(.35)	(.34)	(.18)	(.10)	(.28)	(.54)
Arousal	6.33	6.60	5.65	4.94	6.27	2.15	2.90
	(.24)	(.32)	(.50)	(.40)	(.30)	(.32)	(.43)
Dominance	3.18	2.71	5.55	3.33	3.60	5.39	5.30
	(.37)	(.60)	(.46)	(.66)	(.29)	(.52)	(.67)
Orientation	3.99	3.80	4.73	4.46	3.94	3.44	3.80
	(.39)	(.60)	(.42)	(.39)	(.47)	(.32)	(.37)
Fear	3.37	6.52	1.71	2.54	3.64	1.52	1.57
	(.52)	(.29)	(.38)	(.79)	(1.60)	(.11)	(.32)
Joy	1.30	1.25	6.44	1.19	1.19	4.94	3.02
	(1.33)	(.07)	(.29)	(.17)	(.15)	(.47)	(.80)
Anger	6.41	3.91	1.19	4.85	4.95	1.08	1.40
	(.34)	(1.16)	(.06)	(.97)	(.90)	(.10)	(.18)
Sad	5.72	4.27	1.19	6.10	4.04	1.24	1.35
	(.45)	(1.23)	(.15)	(.38)	(.98)	(.12)	(.17)
Disgust	3.25	3.44	1.17	2.33	6.45	1.08	1.13
	(1.35)	(1.21)	(.09)	(.49)	(.62)	(.09)	(.09)
Surprise	6.27	5.79	5.40	3.05	5.83	1.43	1.48
	(.43)	(.36)	(1.11)	(.35)	(.26)	(.27)	(.12)
Relax	1.32	1.33	3.48	1.75	1.54	5.94	4.55
	(.15)	(.24)	(.58)	(.23)	(.40)	(.22)	(.94)
Current Mood	1.77	1.64	4.64	1.84	1.70	5.16	4.45
	(.24)	(.32)	(.23)	(.14)	(.16)	(.17)	(.59)

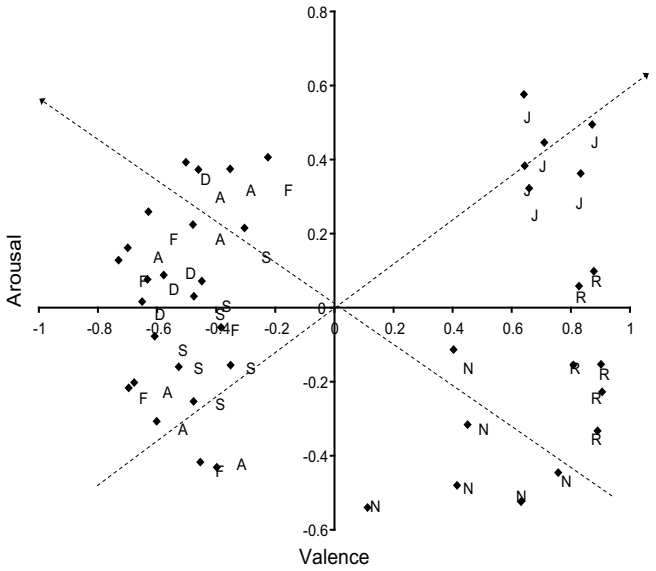

Fig. 2. Placement of scripts of study 2 in affective space based on multidimensional scaling analysis of ratings of current mood. Scripts belonging to specific categories are represented by the capital initials of anger, joy, grief, sadness, fear, disgust, relaxation and neutral.

an interpretable solution, thus the 2-dimensional solution was deemed appropriate (Fig. 2). As one can see, the model fits well with the circumplex, and emotions are placed within all four quadrants. What is of interest is that with this analysis too, few scripts fell on the valence or arousal axes, but rather were clustered around PA/NA.

4. General discussion

The hybrid theory of emotion was examined with ratings of emotional scripts. Descriptive data, EFA and multidimensional scaling supported two main dimensions of valence and arousal. Multidimensional scaling spread materials around the circumference of a circular space (see Fig. 2), supporting further the circumplex model rather than a simple dimensional view.

In study 1, sadness did not fall in the low arousal/negative quadrant, in study 1, and this finding is in accord with prior difficulties of researchers to find materials that fit this quadrant (Panayiotou et al., 2007). Future researchers should be aware that once emotional situations are very negative and personally relevant as was the case with our sadness scripts, it is very hard to keep arousal low. Indeed grief (i.e. scripts pertaining to sad, personal loss) was rated as the most arousing emotion.

Most of the scripts in study 1 fell on the NA axis. Thus, both the valence and arousal and the PA/NA axes, which are alternate representations of the same emotional space were supported. Unfortunately, the orthogonality of arousal and valence was not supported in study 1, which weakens evidence for the circumplex model. The non-zero correlation was probably due to the

absence of materials in the low arousal/negative quadrant. Evidence for this interpretation comes from the non-significant correlation obtained in study 2, in which materials were more evenly distributed.

Factor analyses within each dimension did not result in discrete emotions as anticipated. Instead, in the case of AO the valence and arousal factors appeared while all other dimensions were broken into positive and negative emotions, i.e. the two poles of a single, valence dimension. This one-dimensional view of emotion is very salient in popular conceptualizations of situations as "good" or "bad" or "happy" and "sad" (Larsen & Diener, 1992). Indeed, supporters of dimensional theories do not disagree with the possibility that when reducing the emerging factors through second and third level EFA, the final depiction of emotion is a single hedonic tone dimension interpreted as "happiness"/"unhappiness" (Tellegen, Watson, & Clark, 1999).

Overall, results support a hybrid model of emotion since dimensional space was apparent in the ratings but participants were simultaneously able to place scripts in distinct categories. The hybrid model is evident in the differences and similarities among distinct emotion categories participants perceived. They viewed scripts that were initially defined as Fear as most fearful, etc., but high ratings of the specific emotion were also given to nearby categories. Findings are in accord with Russell (2003), who suggests that at a basic, pre-cognitive level emotion is represented by fundamental dimensions, but becomes categorized according to linguistic and socially determined categories when meta-cognition occurs. Here, factor analyses may have captured the dimensional structure of pre-cognitive affect, but when participants were asked to categorize their experiences using affect terms (e.g. fear, anger) the categorical structure of conscious affective experience was additionally revealed.

With regards to PA/NA, negative affectivity was found to be related to valence but not to arousal, as also found previously (Feldner, Leen-Feldner, Zvolensky, & Lejuez, 2006) and PA/NA appeared to intensify, but not alter affective responses.

A secondary goal was the examination of affect orientation, in relation to other dimensions. External attention was correlated with arousal and not with valence as previously suggested (Sedikides, 1992). The direction of this association, however, is opposite to what was found by Panayiotou et al. (2007), whose data showed that intense, negative affect resulted in internal attention. Targeted correlations, and mean AO ratings for each emotional condition, indicated that external attention was specific to joy and disgust, (and sadness in study 2) and was correlated with dominance, which may thus modify the correlation with arousal. High external attention within joy may be due to its high dominance values. Grief, to the contrary, an arousing/negative emotion, was associated with more *internal* attention. Being in control and knowing what to do may be crucial in allowing attention to shift toward action and the environment. Feeling out of control, as is often the case with intense negative emotions may elicit a search for appropriate action and self-focused attention.

Limitations of this study include the relatively small sample sizes and the less than adequate representation of positive emotions among the materials. However, results add to the accumulated evidence that a hybrid model may be an adequate description of emotional experience. The study has additionally allowed for the standardization of emotional materials in Greek. Further evidence for the hybrid model can be accumulated if such research is replicated in other cultures since this is the first, to our knowledge study of the factor structure of ratings to emotional

scripts. In conclusion, results suggest as Russell (2003) does that affect is probably dimensional in core but acquires categorical qualities once vested with cognitive appraisals and linguistic labels.

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