

Expressions of Positive Emotion in Women's College Yearbook Pictures and Their Relationship to Personality and Life Outcomes Across Adulthood

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To test hypotheses about positive emotion, the authors examined the relationship of positive emotional expression in women's college pictures to personality, observer ratings, and life outcomes. Consistent with the notion that positive emotions help build personal resources, positive emotional expression correlated with the self-reported personality traits of affiliation, competence, and low negative emotionality across adulthood and predicted changes in competence and negative emotionality. Observers rated women displaying more positive emotion more favorably on several personality dimensions and expected interactions with them to be more rewarding; thus, demonstrating the beneficial social consequences of positive emotions. Finally, positive emotional expression predicted favorable outcomes in marriage and personal well-being up to 30 years later. Controlling for physical attractiveness and social desirability had little impact on these findings.

Individual differences in emotion are thought to shape personality and life outcomes across the life course. In this article, we examine whether positive emotionality measured from college yearbook photos at age 21 relates to personality traits, observer responses, marital outcomes, and personal well-being. Our hypotheses were derived from recent theorizing about personality–emotion relations and positive emotion.

A Social–Functional View of Personality–Emotion Relations

A social–functional approach views emotion as a central organizational and motivational force underlying personality (Izard, 1993; Keltner, 1996; Malatesta, 1990; Pervin, 1993). Emotions organize cognitive processes and action tendencies, thereby shaping social interactions in systematic ways (Barrett & Campos, 1987; Ekman, 1992; Frijda & Mesquita, 1994; Izard, 1993; Keltner & Kring, 1998; Plutchik, 1984). Thus, individual differences in emotional tendencies, which appear early in development (Campos, Barrett, Lamb, Goldsmith, & Sternberg, 1983; Goldsmith,

1993), should become associated with particular cognitive structures, behavioral tendencies, and interpersonal styles that define personality traits (Izard, Libero, Putnam, & Haynes, 1993; Malatesta, 1990).

Implications of this approach frame the present study. First, given the role of emotion in personality development, individual differences in emotion should relate to stable aspects of personality. Studies relating self-reports of affective dispositions to higher order personality traits lend credence to this supposition: Reports of negative affect consistently relate to neuroticism, whereas reports of positive affect consistently relate to extraversion, agreeableness, and conscientiousness (Allik & Realo, 1997; Emmons & Diener, 1985, 1986; Gross, Sutton, & Ketelaar, 1998; Larsen & Ketelaar, 1991; McCrae & Costa, 1991; Pavot, Diener, & Fujita, 1990; Tellegen, 1985; Watson & Clark, 1992; Watson, Clark, McIntyre, & Hamaker, 1992). Furthermore, the self-reported tendency to experience particular emotions possesses the traitlike qualities of temporal stability and cross-situational consistency (Diener & Larsen, 1984; Izard et al., 1993; Watson et al., 1992; Watson & Walker, 1996). In this study, we examined how positive emotional expression relates to personality at several times across adulthood.

Second, because emotions shape social interactions, individual differences in emotion should have important short- and long-term social consequences (Keltner, 1996; Magai & Hunziker, 1993). Here the evidence is less extensive but equally suggestive. For example, Caspi, Elder, and Bem (1987) found that the tendency to express uncontrolled anger in early childhood (as assessed by parental reports of frequent, severe temper tantrums) later related to the broader trait of ill-temperedness, which showed considerable stability across the life span. Furthermore, this childhood expres-

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sive tendency predicted negative life outcomes, including lower educational attainment, lower status jobs, lower military rank, erratic work patterns, and divorce. The tendency to express intense anger creates a hostile social environment that brings about the stable expression of trait hostility and a pattern of negative life outcomes in work and family. In the present study, we examined how positive emotionality relates to the life trajectories of women.

Characteristics and Functions of Positive Emotions

Our hypotheses relating positive emotionality to personality, social impact, and life outcomes were derived from recent thinking about positive emotion (Fredrickson, 1998). Whereas negative emotions tend to narrow attention and motivate specific actions, positive emotions broaden thought and action repertoires. In terms of cognition, positive emotions lead individuals to see new connections between ideas, integrate and organize information, and generate novel solutions to problems (Isen, 1987). In terms of action, positive emotions promote a readiness to engage in different activities. For example, joy and happiness incline the individual to interact and play (Frijda & Mesquita, 1994), and interest motivates exploration of the environment. Thus, in one illustrative line of research, individuals induced to feel positive emotion reported greater interest in engaging in different social, leisure, and physical activities (Cunningham, 1988b) and were more likely to initiate conversation with another individual (Cunningham, 1988a) than were those in a neutral or negative emotional state.

Positive emotions also help undo the lingering effects of negative emotions (Levenson, 1988). Thus, in one study, participants who spontaneously smiled after viewing a film that induced negative emotion recovered more quickly from the increased cardiovascular arousal evoked by the disturbing film (Fredrickson & Levenson, 1998). In another study, bereaved individuals who showed Duchenne¹ laughter while talking about their deceased spouse were better able to distance themselves from their distress (as measured by a dissociation between physiological arousal and subjective distress) and to recover more quickly from their loss than those individuals who did not laugh (Bonanno & Keltner, 1997; Keltner & Bonanno, 1997).

Finally, positive emotions have beneficial social consequences. Duchenne smiles and laughter signal friendliness and playfulness, thereby inviting others to approach (Frijda & Mesquita, 1994; Keltner & Kring, 1998; Ruch, 1993). Research on mother–infant interactions (Haviland & Lelwica, 1987; Termine & Izard, 1988) illustrates how those interacting with an individual expressing positive emotion begin to feel and express such emotions. Positive emotions promote helping behavior and cooperation (Cunningham, 1988b; Isen, 1987). In these ways, positive emotions can lead to mutually rewarding social interactions that build and strengthen social bonds.

In sum, positive emotions foster creative thinking, motivate individuals to engage in activities that enhance their personal skills, aid in recovery from negative emotions, and strengthen social bonds. Thus, over time, the repeated experience and expression of positive emotions will help build the individual's intellectual, social, and physical resources and develop satisfying, lasting relationships with others (Fredrickson, 1998). In the present study, we tested hypotheses concerning the relations between individual

differences in positive emotion and personality, social impact, and life outcomes.

Positive Emotional Expression and Personality

To the extent that positive emotions build social and cognitive resources, the tendency to express positive emotion should correlate with personality characteristics indicative of such resources. In the present study, these characteristics included positive emotionality, affiliation, and competence. Positive emotionality encompasses an outgoing and assertive interpersonal style and the tendency to experience positive emotions. Affiliation reflects a nurturing and cooperative interpersonal style and the tendency to feel warmth and sympathy toward others. Competence reflects cognitive skills such as organization, the ability to maintain focused attention, and achievement striving. We expected positive correlations between positive emotional expression and positive emotionality, affiliation, and competence.

To the extent that positive emotions help individuals recover from negative emotions, individuals prone to positive emotions should also be less susceptible to prolonged or repeated experiences of negative emotions. Consistent with this claim, several studies have documented negative correlations between (a) self-reported positive and negative affective tendencies (Diener, Smith, & Fujita, 1995; Watson & Walker, 1996) and (b) higher order personality dimensions indicative of positive affective tendencies (e.g., extraversion, agreeableness) and self-reported negative affective traits (Allik & Realo, 1997; Izard et al., 1993; Watson & Clark, 1992; although see Emmons & Diener, 1985; Gross et al., 1998; Tellegen, 1985; Watson, 1988; Watson et al., 1992). On the basis of the undoing function of positive emotions and the findings just reviewed, we expected positive emotional expression to correlate negatively with the higher order personality trait of negative emotionality.

How will positive emotional expression relate to personality over time? Given the role of emotions in the maintenance and development of personality and the growth-promoting functions of positive emotions, we expected positive emotional expression to continue to relate to these traits measured at later times during adulthood and to predict increases in positive emotionality, affiliation, and competence and decreases in negative emotionality over time.

Positive Emotional Expression and Social Impact

Because positive emotions facilitate pleasurable interactions with others, individuals prone to expressing positive emotions are likely to reap social rewards. A first focus in the present study was trait inferences (Borkenau & Liebler, 1992; Funder & Sneed, 1993). Although they are evanescent, facial expressions signal important information about the emotions and dispositions of the expresser (Ekman, 1993; Fridlund, 1992; Hess, Banse, & Kappas,

¹ A "Duchenne" smile or laugh includes the additional movement of the muscle surrounding the eyes (i.e., orbicularis oculi), resulting in crow's-feet, raised cheeks, and bagging under the eyes. This movement may differentiate smiles or laughs of genuinely felt positive emotions from polite or masking expressions (Ekman, Friesen, & O'Sullivan, 1988; Frank, Ekman, & Friesen, 1993).

1995; Keltner & Kring, 1998). Smiles send the message that an individual is content, friendly, and nonthreatening (Henley & LaFrance, 1984; Keating et al., 1981). Thus, people displaying smiles of enjoyment have been judged by others as extraverted, emotionally stable, agreeable, sociable, pleasant, likable, and intelligent (Borkenau & Liebler, 1992; Frank et al., 1993; Matsumoto & Kudoh, 1993). In this study, we expected positive emotional expression to correlate positively with observers' ratings of positive emotionality, affiliation, and competence and to correlate negatively with negative emotionality. We expected this to be true of observers who only viewed the photos, and those who only interacted with the women in person, suggesting that our measure of positive expression captures a feature of personality that is evident to observers across different contexts.

We also expected positive emotionality to relate to observers' emotional and social responses to the participants, for the simple reason that interacting with individuals who frequently express positive emotions is especially rewarding. For example, Thorne (1987) found that conversations between extraverted dyads tended to be more expansive and upbeat than conversations between introverted dyads. Berry and Hansen (1996) found that individuals scoring high on trait positive affect reported more intimate, enjoyable social interactions with others in a diary study, and in a lab study, these individuals led their interaction partners to engage in higher quality interactions (see also Watson, 1988; Watson et al., 1992). On the basis of studies of the social benefits of positive emotion, we predicted that observers would expect to feel more positive emotion, liking, and trust and less negative emotion toward the women who expressed more positive emotion in their yearbook photos.

Positive Emotional Expression and Long-Term Life Outcomes

For several reasons, we expected positive emotional expression to relate to positive outcomes in marriage and well-being. In the domain of relationships, researchers have documented that positive emotional states and traits contribute in beneficial ways to the formation and maintenance of relationships. Individuals prone to positive affect tend to be more socially engaged with others (Watson, 1988; Watson et al., 1992) and are more likely to be in a romantic relationship (Berry & Willingham, 1997). The expression of positive emotion during conflict discussions predicts increased satisfaction and the reduced likelihood of divorce (Carstensen, Gottman, & Levenson, 1995; Gottman, Coan, Carrere, & Swanson, 1998; Gottman & Levenson, 1992). Trait positive affect correlates positively with increased commitment to a current relationship and the use of constructive rather than destructive strategies to deal with relationship problems (Berry & Willingham, 1997). Agreeableness predicts lower levels of divorce in men (Kelly & Conley, 1987), and congeniality relates to marital stability and satisfaction in women (Bentler & Newcomb, 1978).² On the basis of the hypothesized social benefits of positive emotion, we expected women who expressed more positive emotion in their yearbook photos to be more likely to be married at age 27, to be less likely to remain single into middle adulthood, to experience lower levels of marital tension, and to be more satisfied with their marriages up to 30 years later.

Positive emotional expression should also relate to personal well-being. Feeling positive affect is an important contributor to well-being (see Myers & Diener, 1995), as evident in the well-established relations between extraversion and elevated well-being (Emmons & Diener, 1985; McCrae & Costa, 1991; Pavot et al., 1990; Schmutte & Ryff, 1997). Positive affective tendencies may also enhance individuals' well-being through their influence on social activity and relationship satisfaction, which contribute to personal well-being (Cooper, Okamura, & Gurka, 1992; Schmutte & Ryff, 1997). Finally, because an absence of negative affect is an indicator of well-being (see Myers & Diener, 1995), positive affective tendencies may also increase well-being by helping individuals to recover from negative emotions and difficult times. For these reasons, we expected positive emotional expression to predict higher levels of well-being across adulthood.

The Present Study

To test the aforementioned hypotheses, we examined the relationship of individual differences in positive emotional expression to personality, observer, and life outcome data collected over a 30-year period of adulthood. Positive emotional expression was coded from the college yearbook photographs of women participating in the Mills Longitudinal Study (Helson, 1967; Helson, Mitchell, & Moane, 1984). This coding focused on the actions of two facial muscles (described in the Method section) that relate to positive emotion (Ekman et al., 1988; Frank et al., 1993; Keltner & Bonanno, 1997).

We took into account two alternative explanations for the expected findings. First, physical attractiveness consistently relates to many of the positive outcomes of interest in this study. For instance, others typically judge attractive people more favorably (e.g., Borkenau & Liebler, 1992; Dion, Berscheid, & Walster, 1972; Feingold, 1992) and prefer them as potential mates (Buss, 1989). Physically attractive individuals also tend to report more satisfying social interactions (Reis et al., 1982) and increased well-being (Diener, Wolsic, & Fujita, 1995). Thus, physical attractiveness could potentially account for the relationship of positive emotional expression to favorable observer ratings and outcomes. Second, social desirability could influence the relationship of positive emotional expression to favorable self-reported personality traits, observer responses, and life outcomes. Smiling is socially desirable (Sperduto, Calhoun, & Ciminero, 1978), as is describing oneself and one's life in favorable terms. The inclusion of the muscle surrounding the eyes (i.e., orbicularis oculi), which is difficult to move voluntarily, in the measure of positive emotional expression reduces the likelihood of this possibility, as does a recent study that found no relation between positive emotional expression and self-presentational goals (Levine & Feldman, 1997). Nevertheless, we tested both alternative hypotheses by

² Extraversion, which also contains positive emotional tendencies, has actually been shown to predict higher rates of divorce for men (Bentler & Newcomb, 1978; Kelly & Conley, 1987) and to be unrelated to marital satisfaction or stability in women (Bentler & Newcomb, 1978; Helson & Klohnen, 1998; Kelly & Conley, 1987). However, the elements of sensation seeking and dominance (McCrae & Costa, 1990), which are also part of extraversion, might account for the connection between this trait and unfavorable marital outcomes.

conducting analyses in which the influence of physical attractiveness and social desirability was removed from relations between positive emotional expression and personality, observer ratings, and outcome data.

Method

Sample

In 1958 and again in 1960, a representative two thirds of the senior class ($N = 141$) at Mills College, a private women's college in Oakland, California, participated in a study of personality characteristics and plans for the future among college women (Helson, 1967). A smaller sample of these women also participated in an Institute of Personality Assessment and Research (IPAR) assessment in which they completed personality inventories and were observed by staff members in a variety of situations. The original sample of women ($N = 141$) was contacted again, primarily by mail, at what are labeled the *age 27*, *age 43*, and *age 52* times of testing. At each of these times, the women provided health and demographic information; completed personality inventories; and answered questions on a variety of topics, including marriage, family, social roles, and work.

The analyses in the present study included data from all four times of testing provided by the women for whom yearbook photos were available. At ages 27, 43, and 52, this number of women was approximately 100 or more, but at age 21, the sample size dropped to the 49 women who both participated in the IPAR assessment and had their senior year photographs taken. The sample size also varied somewhat across different analyses because some participants did not provide data at all ages or for all variables.

Still Photographs

The photographs used in this study came from the Mills College yearbooks of 1958 and 1960. The women in the Mills sample were in their senior year and were approximately 20 to 21 years of age when the pictures were taken. The pictures were photographed from the yearbook pages and were enlarged to 4 × 6 in. (10.16 × 15.24 cm; Kaner, 1994).

Coding of Facial Behavior in the Photographs

Facial behavior in the photographs was coded using the Facial Action Coding System (FACS) developed by Ekman and Friesen (1976, 1978), which distinguishes 44 minimal action units of facial activity that are anatomically separate and visually distinguishable. Scoring involves decomposing a facial movement into the particular action units that produced it, either singly or in combination with other units. Each of these muscle movements was scored on a 5-point scale (1 = *minimal intensity*, 3 = *moderate intensity*, and 5 = *extreme intensity*). A continuous measure of positive emotional expression was created by adding together the scores for Action Units 6 and 12, both of which are involved in the display of positive emotions such as enjoyment and amusement. Action Unit 12 corresponds to the action of the zygomatic major muscle and involves the angled upward movement of the lip corners (i.e., a smile). Action Unit 6 corresponds to the contraction of the orbicularis oculi muscle (i.e., the muscle surrounding the eyes) and results in raised cheeks, crow's-feet, and bagging under the eyes.

One FACS-certified person (LeeAnne Harker) coded all of the photographs. A second FACS-certified person (Dacher Keltner) coded 47 of the photographs. Neither of the coders had access to personality inventory or any other information about the participants at the time of scoring. Inter-coder reliability was evaluated by using a ratio in which the number of action units on which the two coders agreed was multiplied by two and then divided by the total number of action units scored by the two persons

(this reliability procedure has also been used by other FACS researchers; see Keltner, 1995). This agreement ratio was .81.

Self-Report Personality Measures

Participants described themselves on the Adjective Check List (ACL; Gough & Heilbrun, 1983) at ages 21, 27, 43, and 52. The ACL contains 300 items with a check/no-check response format and provides scores on 37 different scales.

Because the ACL contains so many scales, some of which overlap considerably, Helson and Roberts (1992) conducted a principal-components factor analysis with varimax rotation and obtained four interpretable factors: Competence, Affiliation, Forcefulness, and Individuality. Four higher order cluster scales were developed by adding together the ACL scales that had high loadings on one factor and cross-loadings less than .50 on the other factors. In the present study, we used two of these cluster scales. The Affiliation cluster closely resembles the Big Five personality dimension of Agreeableness. The ACL scales with the highest loadings on this factor are Nurture and Affiliation (the remaining ACL scales that compose this cluster are Low Origence/Low Intellectence, Heterosexuality, Feminine Attributes, and Counseling Readiness—reversed). Of the individual ACL items, those that correlate the highest with this cluster include *warm*, *cheerful*, *pleasant*, *sociable*, *understanding*, *contented*, and *affectionate*. The alpha reliability coefficients for the Affiliation cluster were .80 or higher at the four times of testing. The Competence cluster closely resembles the Big Five personality dimension of Conscientiousness. The ACL scales with the highest loadings on this factor are Endurance and Order (the remaining ACL scales that compose this cluster are Low Origence/High Intellectence, Achievement, Ideal Self, and Succorance—reversed). The individual adjectives that correlate the highest with this cluster include *organized*, *thorough*, *efficient*, *practical*, *clear thinking*, *realistic*, and *precise* (a subsidiary theme of adjustment is also evident in adjectives such as *mature*, *confident*, and *contented*). The alpha reliability coefficients for the Competence cluster were greater than .90 at all four times of testing. For more details, see Helson and Roberts (1992) and Wink and Helson (1993).

In addition to the two factors described above, we used two scales created from ACL items by Gough, Bradley, and Bedeian (1996) that measure Tellegen's (1985) higher order constructs of positive and negative emotionality and closely resemble the Big Five personality dimensions of Extraversion and Neuroticism. Each scale consists of 20 different adjectives from the ACL. Representative items from the Positive Emotionality scale include *enthusiastic*, *outgoing*, *energetic*, *assertive*, *adventurous*, and *humorous*.³ Representative items from the Negative Emotionality scale include *dissatisfied*, *fearful*, *nervous*, *irritable*, *hostile*, and *gloomy*. Helson

³ Although there is some overlap between the Affiliation and Positive Emotionality scales, in that both include a tendency toward positive affect and sociability, there are also important distinctions between these scales. For instance, many of the positive affects encompassed by Affiliation pertain to other-directed feelings, such as warmth, sympathy, pleasantness, affection, and appreciation, which tend to promote harmonious interpersonal relations. In contrast, the positive affect tendencies encompassed by the Positive Emotionality scale, such as enthusiastic, alert, and humorous, are generally more agentic. Furthermore, the two scales differ with regard to the additional traits they include. Affiliation, for instance, encompasses a cooperative, helpful, and considerate interpersonal style, whereas Positive Emotionality entails more ascendant social qualities (e.g., assertive, forceful, has initiative) combined with a high activity level (e.g., active, adventurous, energetic). These distinctions are similar to those drawn between the Big Five dimensions of Extraversion and Agreeableness (e.g., John, 1990) and Tellegen's (1985) Positive Emotionality subscales of Social Closeness and Social Potency.

and Klohnen (1998) conducted a comprehensive construct validation of these two scales and found that they showed the expected pattern of convergent and discriminant relations with a variety of relevant personality inventory and life data. At age 21, the alpha reliability coefficients for these scales were .84 for Positive Emotionality and .77 for Negative Emotionality. At the three later times of testing, all alpha coefficients were greater than .85 for both scales (Helson & Klohnen, 1998).

IPAR Staff Personality Ratings

At age 21, a few months after the initial data collections in 1958 and 1960, 49 of the participants for whom yearbook pictures were available took part in an IPAR assessment. (At age 27, an additional 5 women also participated in an IPAR assessment, and observer data for these participants are included with the original 49 participants in the variables described subsequently.) The women were assessed in groups of 12 individuals for 1 day lasting about 12 hr during which time the IPAR staff members (i.e., predominantly male psychology professors and graduate students) observed or interacted with the women in a variety of situations, including interviews, group discussions, charades, and eating meals (Helson, 1967, 1985). These staff members later provided descriptions of each of the participants on the California Q-sort method (Block, 1978), which contains 100 items that cover a broad domain of personality, interpersonal, emotional, and cognitive characteristics. Observers sorted each of these 100 items into nine piles, ranging from least to most salient, with a quasi-normal fixed distribution of 5, 8, 12, 16, 18, 16, 12, 8, 5. The number of observers making ratings for each participant ranged from four to seven.

From the Q-sort items, we rationally constructed four different scales by selecting items that conceptually matched the self-reported ACL personality dimensions. The Positive Emotionality scale, for example, includes items encompassing some of the various facets of this trait, such as sociability, activity level, and a tendency toward experiencing positive affect. This scale has an alpha reliability of .81 and contains the following 6 items: "Is cheerful, happy"; "Responds to and appreciates humor"; "Initiates humor, makes spontaneous funny remarks"; "Talkative"; "Is sociable, gregarious"; and "Has a rapid personal tempo; behaves and acts quickly."

The Negative Emotionality scale contains items reflecting difficulties coping with stress and a tendency toward experiencing negative affect. This scale has an alpha reliability of .77 and contains the following 6 items: "Is irritable; over-reacts to minor frustrations"; "Is generally fearful"; "Is basically anxious"; "Has hostility towards others"; "Has a brittle ego defense system"; and "Is calm, relaxed in manner" (reversed).

The Affiliation scale reflects the different aspects of this trait, including cooperativeness, interpersonal closeness, and a tendency to experience warmth, sympathy, and low hostility toward others. This scale has an alpha reliability of .93 and contains the following 13 items: "Is giving, generous toward others"; "Is protective of those close to her"; "Behaves in a sympathetic and considerate manner"; "Arouses nurturant feelings in others"; "Tends to arouse liking and acceptance in people"; "Has warmth; has the capacity for close relationships"; "Is personally charming"; "Behaves in a feminine style or manner"; "Keeps people at a distance; avoids close relationships" (reversed); "Is basically distrustful of people" (reversed); "Is subtly negativistic; tends to undermine, obstruct, or sabotage other people" (reversed); "Is guileful, deceitful, manipulative, opportunistic; takes advantage of others" (reversed); and "Tends to blame others for own mistakes, failures, and shortcomings" (reversed).

The Competence scale encompasses general competence, productivity, responsibility, and achievement striving. This scale has an alpha reliability of .74 and contains the following 7 items: "Is productive, gets things done"; "Is dependable and responsible"; "Appears to have a high degree of intellectual capacity"; "Prides self on being rational, logical, objective"; "Has high aspiration level for self"; "Able to see to the heart of important problems"; and "Unable to delay gratification" (reversed).

Observer Ratings Based Only on Viewing the Yearbook Photos

Each of the photos was observed by six undergraduate psychology students (both male and female) who received course credit for their participation. Each judge rated a total of 10 pictures. They were asked to look carefully at each photograph, form an impression of the woman in the photo, and then complete personality and interpersonal impact rating forms. These two forms were counterbalanced in their presentation so that half of the observers of each photograph rated personality first and half rated interpersonal impact first.

Personality ratings. The personality rating form consisted of 16 personality terms selected for their conceptual similarity to each of the four self-reported ACL personality dimensions described above. To represent the Affiliation and Competence clusters, 4 ACL items that correlate highly with each of the self-reported dimensions were used. For Affiliation, these terms include *warm*, *cheerful*, *sociable*, and *pleasant*. For Competence, the terms include *organized*, *efficient*, *confident*, and *contented*. To measure Tellegen's (1985) higher order emotionality constructs, we chose 4 ACL items from each of the 20-item self-report scales that best represented the scales as a whole. For Positive Emotionality, these terms include *enthusiastic*, *friendly*, *humorous*, and *outgoing*. For Negative Emotionality, the terms include *dissatisfied*, *irritable*, *fearful*, and *nervous*. Using a 5-point rating scale (1 = *highly uncharacteristic*, 3 = *neither characteristic nor uncharacteristic*, and 5 = *highly characteristic*), judges rated the extent to which these 16 personality terms described the person in the photograph. Their ratings for each term were then averaged together to compute scores on the four personality dimensions described above. The alpha reliability coefficients indicating the level of internal consistency for these dimensions were .93 for Positive Emotionality, .78 for Negative Emotionality, .96 for Affiliation, and .68 for Competence.

Interpersonal impact ratings. On the interpersonal impact rating forms, judges were first asked to imagine what it would be like to meet and interact with the person in the photograph. They were then asked to rate on a 5-point scale (1 = *not at all*, 3 = *moderately*, and 5 = *extremely*) the extent to which they thought they might feel a variety of different emotions while interacting with the person in the picture. The averages of observers' ratings of amusement and happiness were added together to create a composite measure of expected positive emotions ($\alpha = .91$), whereas the averages of their ratings of anxiety, anger, discomfort, irritation, and sadness were added together to create a composite measure of expected negative emotions ($\alpha = .83$).

After the judges rated their expected emotional responses to the women in the photographs, they were asked to rate on a 5-point scale (1 = *disagree*, 3 = *neither agree nor disagree*, and 5 = *agree*) the extent to which they agreed or disagreed with a series of statements about the person in the picture. These statements concerned the participant's personal impact on the judge and included "I would be interested in getting to know her," "I would avoid interacting with her" (reversed), "I think I would like her," and "I feel I could trust her." The averages of observers' responses to these 4 items were added together to form a composite measure of social approach-acceptance ($\alpha = .93$).

Life Outcomes

Marriage. Marital status at age 27: Women were classified as either married (scored as 1) or single (scored as 0). *Remained single:* At age 43, women who had never married were classified as having remained single (scored as 1), and women who were married at any time up to that assessment were classified as not remaining single (scored as 0). *Ever divorced:* At age 43, women were classified as having divorced (scored as 1) or as having been married but never divorced (scored as 0); women who never married were not included. *Marital Tensions Check List:* Women rated 32 statements at age 27 and 38 statements at age 52 concerning

marital tensions involving themselves (e.g., "You are not affectionate and personal enough") and their partners (e.g., "Partner is not affectionate and personal enough") on a 4-point rating scale (1 = *not true* and 4 = *very true*). These statements cover a variety of different sources of marital tension, including dissatisfaction with financial matters, sexual relations, personal qualities, and division of responsibilities. The alpha coefficients for this scale were .87 at age 27 and .90 at age 52. *Marital satisfaction*: At age 52, the participants answered the following question about their marital relationship: "Overall, how satisfied are you with this relationship?" on a 5-point scale (1 = *not at all*, 3 = *fairly well*, and 5 = *very well*).

Well-being. The California Psychological Inventory (Gough, 1987) was administered to the Mills participants at ages 21, 27, 43, and 52. The Well-Being scale of this inventory contains 38 items that indicate good emotional and physical health (Gough, 1987; Gough & Bradley, 1996). High scorers on this scale feel satisfied with their lives, have good relations with others, withstand stress well, and report an absence of physical symptoms and extreme irritations (Gough & Bradley, 1996). This scale has good reliability and correlates with relevant personality and life data (see Gough & Bradley, 1996, for details).

Control Variables

Physical attractiveness ratings. An equal number of male and female observers representing three different groups (i.e., 20 undergraduate college students, 20 graduate students, and 10 individuals between 50 and 60 years old) rated the yearbook photos of Mills participants in terms of physical attractiveness (Kaner, 1994). These observers sorted the photographs into nine piles, ranging from least to most physically attractive, with a quasi-normal fixed distribution similar to the Q-sort described above. The overall alpha reliability was .98, and there were no significant mean differences between groups of observers (Kaner, 1994).

Social desirability. At the age 21 assessment, the Minnesota Multiphasic Personality Inventory (Hathaway & McKinley, 1943) was administered. The Edwards Social Desirability scale of this inventory assesses the degree to which individuals may be motivated to respond in ways that will garner social approval (see Edwards, 1957).

Results

Positive Emotional Expression in the Yearbook Photographs

All but 3 of the women smiled in their yearbook pictures. Of these 111 smiles, 50 were Duchenne smiles involving the contraction of the orbicularis oculi muscle surrounding the eyes. The mean score for the continuous measure of positive emotional

expression (i.e., Action Unit 6 + Action Unit 12) was 3.80, the standard deviation was 1.87, and the highest score obtained was 8.00 (out of a possible 10). Thus, although most women smiled, they varied considerably in terms of the intensity of their smiles and whether they contracted the muscle circling the eyes.

Positive Emotional Expression and Self-Reported Personality Across Adulthood

We first hypothesized that positive emotional expression in the yearbook photos would correlate positively with concurrent and later measures of self-reported positive emotionality, affiliation, and competence and would correlate negatively with self-reported negative emotionality. We also predicted that positive emotional expression would relate to increases in positive emotionality, affiliation, and competence and to decreases in negative emotionality during different periods of adulthood.

Concurrent relations. The second column of Table 1 presents the simple Pearson product-moment correlations between positive emotional expression in the yearbook photos and the four dimensions of self-reported personality measured with the ACL at age 21. Consistent with our hypotheses, positive emotional expression correlated positively with affiliation and negatively with negative emotionality. However, positive emotional expression was unrelated to either positive emotionality or competence. At age 21, women showing greater intensity of positive emotional expression in their pictures were nurturing, caring, and sociable. In addition, they were more prone to experiencing contentment, cheerfulness, sympathy, and interpersonal warmth (positive affective traits encompassed by affiliation) and less susceptible to negative affect.

Stability of relations over time. The correlations between positive emotional expression in the yearbook photos and self-reported personality at the later ages of 27, 43, and 52 are presented in the remaining columns of Table 1. As Table 1 illustrates, positive emotional expression continued to relate to personality at ages 27, 43, and 52, although the strength and pattern of these relationships changed somewhat. The relationship between positive emotional expression and affiliation at age 21 weakened over time but was still evident at ages 43 and 52 in the correlations between positive emotional expression and the two ACL scales that loaded most highly onto this factor (i.e., Nurturance and

Table 1
Correlations Between Positive Emotional Expression in the Yearbook Photos and Self-Reported Personality at Four Different Times in Adulthood

ACL personality dimension	Age 21 (n = 49)	Age 27 (n = 89)	Age 43 (n = 104)	Age 52 (n = 100)
Positive emotionality	-.20	-.03	.02	.10
Negative emotionality	-.37**	-.21*	-.21*	-.27**
Affiliation cluster	.33*	.09	.18†	.14
ACL Affiliation scale	.33*	.14	.23*	.16†
ACL Nurturance scale	.31*	.06	.20*	.22*
Competence cluster	-.04	.19†	.20*	.29**

Note. Two ACL scales (i.e., Affiliation and Nurturance) that make up the Affiliation cluster are listed in this table because they show a stronger relationship to positive emotional expression over time than the overall cluster. ACL = Adjective Check List.

† $p < .10$. * $p < .05$. ** $p < .01$.

Affiliation). As at age 21, positive emotional expression continued to correlate negatively with negative emotionality at ages 27, 43, and 52. The expected relationship between positive emotional expression and competence was not evident at age 21, emerged at age 27, remained stable at age 43, and grew stronger at age 52.

Personality change. To test our hypotheses concerning personality growth, personality change indices were created by partialing scores on a particular personality dimension at a younger age (i.e., ages 21, 27, and 43) out of scores on that dimension at the next age period (i.e., ages 27, 43, and 52) and retaining the residuals. These residual change scores represent the variance in a particular trait at one time period that cannot be predicted by earlier levels of that trait. The correlations between these scores and positive emotional expression are presented in Table 2. Positive correlations indicate that positive emotional expression related to increases in the trait over time, whereas negative correlations indicate that positive emotional expression related to decreases in that trait. Positive emotional expression related to increases in competence and decreases in negative emotionality during two periods of adulthood.

Observers' Judgments of Personality

Indices of interjudge agreement were first computed for the observers who made their ratings after viewing the photographs.⁴ The average interjudge correlations and alpha coefficients were as follows: .52 and .87 for positive emotionality, .47 and .84 for affiliation, .23 and .65 for competence, and .24 and .65 for negative emotionality. Thus, these observers reached moderate to high levels of consensus in their ratings of the personalities of the Mills participants. For the IPAR staff ratings of personality, interjudge

Table 2
Correlations Between Positive Emotional Expression in the Yearbook Photos and Residual Change Scores in Self-Reported Adjective Check List Personality Dimensions

Personality dimension	Positive emotional expression
Positive emotionality	
Change from age 21 to age 27	.03
Change from age 27 to age 43	-.02
Change from age 43 to age 52	.15
Negative emotionality	
Change from age 21 to age 27	-.31*
Change from age 27 to age 43	.00
Change from age 43 to age 52	-.18†
Affiliation	
Change from age 21 to age 27	.25
Change from age 27 to age 43	.17
Change from age 43 to age 52	.06
Competence	
Change from age 21 to age 27	.44**
Change from age 27 to age 43	-.08
Change from age 43 to age 52	.21*

Note. Positive correlations indicate that positive emotional expression relates to increases in a particular trait over time, whereas negative correlations indicate that positive emotional expression relates to decreases in that trait over time. From ages 21 to 27, $n = 41$; from ages 27 to 43, $n = 85$; and from ages 43 to 52, $n = 95$.

† $p < .10$. * $p < .05$. ** $p < .01$.

agreement for the dimensions of interest in the present study was not obtained. However, information about these observers' agreement on each individual's entire Q-sort protocol was available. With one exception,⁵ interjudge agreement for individual participants' entire Q-sorts ranged from an alpha coefficient of .37 to .88, with an average alpha of .72. Thus, IPAR staff observers also showed an adequate to high level of agreement with one another in their ratings of the participants' personalities.

Positive emotional expression was expected to relate to observer ratings of positive emotionality, affiliation, competence, and low negative emotionality. The correlations relevant to these predictions are presented in Table 3. The second column of Table 3 shows that those participants expressing greater positive emotion in their yearbook pictures were viewed by observers with access only to those photographs to be higher on positive emotionality, affiliation, and competence and lower on negative emotionality. The third column of Table 3 indicates that IPAR observers rated women showing greater intensity of positive emotion in their yearbook pictures higher on affiliation and lower on negative emotionality. However, positive emotional expression was not related to this group of observers' judgments of positive emotionality or competence.

Observers' Social and Emotional Responses

We hypothesized that observers would expect interactions with women expressing more positive emotion in their yearbook pictures to be more rewarding and that they would be more inclined to approach these women. The correlations between positive emotional expression and observers' emotional and social responses after they viewed each of the photographs and imagined what it would be like to meet and interact with the Mills participants are presented in Table 4. Consistent with our hypotheses, the degree of positive emotional expression shown by the women in the pictures correlated positively with observers' expectations of experiencing positive emotions and reported inclinations to approach and accept the women in a hypothetical interaction and correlated negatively with their expectations of experiencing negative emotion.

Long-Term Life Outcomes

To test the hypothesis that the beneficial effects of positive emotional expression might accumulate over time, positive emotional expression was correlated with life outcomes in the domains of marriage and personal well-being. These correlations are presented in Table 5.

⁴ Please note that the alpha reliabilities of various dimensions of observer ratings of personality (i.e., affiliation, competence, and positive and negative emotionality) reported in the Method section are different from estimates of interjudge agreement. These alpha coefficients represent the internal consistency of the personality scales after individual judges' ratings for particular terms were averaged and then added together to construct the different personality dimensions.

⁵ The alpha coefficient for 1 participant was $-.08$. Because this level of interjudge agreement was substantially lower than the agreement for all other participants, it may reflect an error in the use of the rating scale by one or more of the observers. Consequently, this participant was excluded from analyses using Q-sort observer data.

Table 3
Correlations Between Mills Longitudinal Study Participants' Positive Emotional Expression in the Yearbook Photos and Two Different Kinds of Observer Ratings of Personality

Personality dimension	Ratings made after viewing photos (n = 114)	IPAR staff ratings (n = 53)
Positive emotionality	.71***	.07
Negative emotionality	-.57***	-.29*
Affiliation	.69***	.52***
Competence	.21*	.04

Note. IPAR = Institute of Personality Assessment and Research.
* $p < .05$. *** $p < .001$.

Marital outcomes. Positive emotional expression in the yearbook pictures was expected to predict future marital status. Consistent with this expectation, women displaying more positive emotion were more likely to be married by age 27 and were less likely to remain single into middle adulthood. We also expected individuals expressing more positive emotion to have more satisfying marriages. Consistent with this view, positive emotional expression correlated positively with marital satisfaction at age 52 and negatively with marital tensions at ages 27 and 52, although these latter correlations were not significant. Positive emotional expression was not significantly related to getting divorced or to marital satisfaction at age 43.

Personal well-being. Our final prediction was that positive emotional expression would correlate with increased personal well-being across adulthood. Consistent with this expectation, women showing more positive emotion in their pictures scored higher on well-being at ages 21, 27, 43, and 52.

Controlling for Physical Attractiveness and Social Desirability

Several preliminary findings justified our concern that physical attractiveness and social desirability might account for the observed relations between positive emotional expression and personality, social impact, and life outcomes. Positive emotional expression was correlated with both attractiveness ($r = .15, N = 114$) and social desirability ($r = .20, p < .05, N = 111$). In addition, as Table 6 shows, attractiveness did relate to favorable personality judgments and responses from observers (Column 2), and social desirability correlated significantly with favorable self-

Table 4
Correlations Between Mills Longitudinal Study Participants' Positive Emotional Expression in the Yearbook Photos and Observer Responses

Observer response	Positive emotional expression
Expected positive emotions	.70***
Expected negative emotions	-.57***
Approach-acceptance	.52***

Note. $n = 114$.
*** $p < .001$.

Table 5
Correlations Between Positive Emotional Expression in the Yearbook Photos and Life Outcomes

Life outcome	Positive emotional expression
Marital status	
Married by age 27 (n = 111)	.19*
Remained single into middle adulthood (n = 112)	-.20*
Marital stability: Ever divorced (n = 97)	.15
Marital satisfaction	
Age 43 (n = 79)	.00
Age 52 (n = 71)	.20†
Marital tensions	
Age 27 (n = 66)	-.15
Age 52 (n = 65)	-.20
Personal Well-being (CPI scale)	
Age 21 (n = 112)	.20*
Age 27 (n = 86)	.25*
Age 43 (n = 105)	.18†
Age 52 (n = 101)	.27**

Note. CPI = California Psychological Inventory.
† $p < .10$. * $p < .05$. ** $p < .01$.

descriptions of personality, observer ratings, and life outcomes (Column 3). The last two columns of Table 6 reveal that, for the most part, positive emotional expression continued to relate to the variables of interest when attractiveness and social desirability were partialled out. The analyses controlling for attractiveness did not affect the hypothesized correlations, and the analyses controlling for social desirability substantially affected the relations between positive emotional expression and personal well-being only at ages 21 and 43.

Discussion

Emotional tendencies are believed to shape personality and the life course through their influence on cognitive, behavioral, and social processes (Izard, 1993; Keltner, 1996; Malatesta, 1990). We examined these issues in a study of the life trajectories of women who varied in their expression of positive emotion. Consistent with recent accounts of positive emotion, individual differences in women's positive emotional expression in their college yearbook photos related to (a) stable aspects of personality and change in certain traits over time, (b) observers' judgments of the women's personalities and their responses to these women, and (c) life outcomes measured up to 30 years later. We now consider the broader implications of each of these findings.

Positive Emotional Expression and Self-Reported Personality Across Adulthood

Fredrickson (1998) posited that positive emotions build personal resources by fostering creative thinking, the readiness to take advantage of opportunities, the strengthening of social bonds, and the undoing of negative emotions. In support of these claims, positive emotional expression in the yearbook pictures related positively to the personality traits of affiliation and competence, which reflect good interpersonal and cognitive skills, respectively, and negatively to negative emotionality, in both young and middle

Table 6
Influence of Physical Attractiveness and Social Desirability on Correlations Between Positive Emotional Expression in the Yearbook Photos and Self-Reported Adjective Check List Dimensions of Personality, Observer Ratings, and Life Outcomes

Variable	Physical attractiveness	Social desirability	Positive emotional expression	Partial correlation with positive emotional expression, controlling for physical attractiveness	Partial correlation with positive emotional expression, controlling for social desirability
Self-reported negative emotionality					
Age 21	.00	-.46***	-.37**	-.37**	-.32*
Age 27	-.01	-.36***	-.21*	-.21*	-.21†
Age 43	.08	-.29**	-.21*	-.23*	-.18†
Age 52	.04	-.16†	-.27**	-.29**	-.28**
Self-reported affiliation (cluster)					
Age 21	-.04	.26†	.33*	.34*	.29*
Age 43	.01	.02	.18†	.18†	.16
Self-reported affiliation (subscale)					
Age 21	-.12	.44***	.33*	.36*	.28*
Age 43	-.05	.19*	.23*	.24*	.20*
Age 52	-.05	.11	.16†	.18†	.14
Self-reported nurturance (subscale)					
Age 21	-.06	.24†	.31*	.33*	.28*
Age 43	.01	-.02	.20*	.20*	.19†
Age 52	-.06	-.04	.22*	.24*	.23*
Self-reported competence					
Age 27	-.03	.23*	.19†	.20†	.16
Age 43	-.18†	.26**	.20*	.24*	.15
Age 52	-.07	.25*	.29**	.31**	.26*
IPAR staff ratings of personality					
Negative emotionality	-.08	-.23†	-.29*	-.29*	-.29*
Affiliation	.00	.25†	.52***	.52***	.46***
Photo-based ratings of personality					
Positive emotionality	.16†	.31**	.71***	.71***	.72***
Negative emotionality	-.26**	-.26**	-.57***	-.56***	-.57***
Affiliation	.16†	.34***	.69***	.68***	.70***
Competence	.34***	.10	.21*	.17†	.19*
Observers' expected social responses					
Positive emotions	.23*	.23*	.70***	.69***	.68***
Negative emotions	-.14	-.22*	-.57***	-.56***	-.55***
Approach-acceptance	.38***	.16†	.52***	.51***	.50***
Marital outcomes					
Status at age 27	.07	.12	.19*	.18†	.16†
Remained single	-.12	-.10	-.20*	-.18†	-.20*
Satisfaction at age 52	.18	.19	.20†	.16	.18
Well-being					
Age 21	.03	.72***	.20*	.20*	.11
Age 27	.00	.43***	.25*	.26*	.23*
Age 43	-.02	.35***	.18†	.19*	.12
Age 52	.03	.31***	.27**	.28**	.24*

Note. This table contains only those criterion variables that related significantly ($p < .10$) to positive emotional expression in the yearbook photos before we controlled for physical attractiveness or social desirability. Partial correlations were also run for the remaining criterion variables in this study, but removing the variance associated with either of the two control variables did not substantially change the size of their correlation with positive emotional expression. Sample sizes are reported in Tables 1-5. IPAR = Institute of Personality Assessment and Research.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

adulthood. Positive emotional expression also predicted increases in competence and decreases in negative emotionality between ages 21 and 27 and again from ages 43 to 52. Over time, women who expressed more positive emotion in their yearbook pictures became more organized, mentally focused, and achievement-oriented and less susceptible to repeated and prolonged experiences of negative affect. These findings are all the more impressive in light of the highly constrained nature of the context in which emotion was measured (i.e., having one's photograph taken) and the limited sample of behavior.

In light of well-documented positive correlations between positive emotionality and extraversion and self-reported positive affect (e.g., Allik & Realo, 1997; Izard et al., 1993; Watson & Clark, 1992), our failure to find a significant correlation between positive emotional expression and positive emotionality is perhaps the most puzzling result of the study. Here, the highly constrained nature of the context may have worked against our hypothesis. Smiling for the yearbook requires taking instructions from a photographer, which may have been countervailed by the assertive tendencies of individuals scoring high on trait positive emotionality. In fact,

positive emotional expression in the yearbook did relate to positive affective traits of cheerfulness, contentment, and interpersonal warmth encompassed by the affiliation trait. Had we assessed the positive emotional expression of these women in contexts in which they were freer to express themselves, we may have observed significant correlations between positive emotional expression and positive emotionality.

The relations between positive emotional expression in the yearbook and personality are significant in several ways. Previous research has established relations between self-reported emotional tendencies and personality traits (Allik & Realo, 1997; Larsen & Ketelaar, 1991; McCrae & Costa, 1991; Watson & Clark, 1992) and the temporal stability of self-reported positive affective tendencies (Diener & Larsen, 1984; Izard et al., 1993; Watson et al., 1992). The present study is one of the first to document that individual differences in expression relate to personality and may be stable aspects of personality. The finding that positive emotional expression predicted increases in competence and decreases in negative emotionality is some of the first evidence indicating that emotion may contribute to the development of personality in adulthood (Malatesta, 1990).

Positive Emotional Expression and Social Impact

Facial expressions of emotion structure social interactions by conveying information about current feelings, social intentions, and enduring dispositions and by evoking emotional responses in others (Darwin, 1872/1965; Ekman, 1993; Fridlund, 1992; Keltner & Kring, 1998). Consistent with previous studies of the Duchenne smile (Frank et al., 1993; Matsumoto & Kudoh, 1993), observers with access only to the yearbook pictures rated women showing more positive emotion in these pictures higher on positive emotionality, affiliation, and competence and lower on negative emotionality. These college student observers also responded with positive emotion and approach-related tendencies to the women who showed more positive expressions, consistent with previous studies (Keltner & Bonanno, 1997). For the IPAR staff observers who did not view the photos but did interact with the women, the influence of positive emotional expression on their judgments was similar but not as dramatic in terms of the number of dimensions involved or the size of the relationships obtained.

These findings are revealing in several ways. The data from the IPAR observers suggest that the expressions that women showed in their yearbook photos carry over to other social situations and influence observer ratings despite the presence of many other cues. That is, positive expression measured in one context influenced social inference in another, suggesting that our measure of positive emotional expression captured something that generalizes across contexts.

It is also interesting to note that the correlations between positive emotional expression and personality for the IPAR observers corresponded more closely to the expression–personality correlations of the actual participants (only the relations between positive expression and self-reported affiliation and negative emotionality were significant at age 21). IPAR observers had more information on which to base their personality ratings, which is likely to have led them to more accurate inferences from emotional display. The college student observers who had very little information to go on made more encompassing dispositional inferences from the wom-

en's smiles. It would be interesting to determine whether the tendency to make more extreme personality inferences with less behavioral information is a general rule in personality judgment.

Finally, the findings concerning observers' emotional responses to the women complement other studies of the enhanced social lives of people who report elevated positive affect. People enjoy and may more often actively seek out interactions with these sorts of people (Berry & Hansen, 1996; Thorne, 1987; Watson, 1988; Watson et al., 1992). Simple differences in emotionality appear to create strikingly different social contexts.

Positive Emotional Expression and Long-Term Outcomes

Our strongest test of the idea that positive emotion helps create a salutary life context is found in the correlations between positive emotional expression and the quality of a social bond that really matters—the spousal relationship. Previous research by Caspi et al. (1987) documented the adverse effects of the tendency to express uncontrolled anger on work life and marriage. Our findings complement those of Caspi et al.: Those women who displayed more positive emotion in their yearbook pictures were more likely to be married by age 27, less likely to have remained single into middle adulthood, and more likely to have satisfying marriages 30 years later. These findings correspond with those of researchers who have documented how momentary displays of positive emotion help married couples deal more effectively with conflict in their relationships (Gottman et al., 1998).

Positive emotional expression in the yearbook photos also predicted high scores on the Well-Being scale of the California Psychological Inventory at ages 21, 27, 43, and 52. Across young and middle adulthood, women prone to expressing positive emotions experience fewer psychological and physical difficulties, have better relations with others, and generally feel more satisfied with their lives. Although previous research has linked self-reported extraversion, which encompasses positive affective tendencies, to well-being (Emmons & Diener, 1985; McCrae & Costa, 1991; Pavot et al., 1990; Schmutte & Ryff, 1997), the present study is the first to link positive emotional expression to personal well-being. It is important to explore the paths by which positive emotional expression both directly and indirectly elevates personal well-being over the life course through its beneficial effects on social relationships and by helping individuals to recover from the lingering effects of negative affect.

Ruling Out Alternative Explanations

There are many reasons why women might smile while having their photo taken, and consequently, there are many possible alternative explanations for the findings we observed. We focused on two explanations prompted by relevant empirical literatures: attractiveness and social desirability. Consistent with previous research (e.g., Borkeau & Liebler, 1992; Buss, 1989; Dion et al., 1972; Feingold, 1990, 1992; Reis et al., 1982), attractiveness in the present study related to favorable personality ratings and responses from observers. Nevertheless, removing the variance associated with attractiveness from both the predictor and criterion variables had no impact on the relationship between positive emotional expression and the other variables examined. There is more to positive emotional expression for women than beauty.

A similar story emerged in our analyses of social desirability. Social desirability did indeed correlate with the measures of positive emotional expression and favorable self-reported personality, observer ratings, and life outcomes. Nevertheless, the majority of correlations between positive emotional expression and these other variables remained significant even after we statistically controlled for social desirability.

Limitations and Directions for Future Research

The present study has several limitations that highlight future areas of research. Our measure of positive emotional expression consisted of a single instance of very limited behavior (it is hard to think of a thinner slice of behavior). In light of the well-known principles of personality, prediction, and statistical aggregation (see Bem & Allen, 1974; Epstein, 1983), future researchers are likely to obtain more robust relations between emotional expression and personality by measuring expression on different occasions and in diverse contexts. Although our study suggests that expressive tendencies represent stable aspects of personality, future research will need to measure expressions of emotion at different time periods to conclusively establish the temporal stability of tendencies to express positive emotions. Our study examined the correlates of a general measure of positive emotional expression, rather than discrete emotions. Thus, it will be interesting to determine whether the expressions of specific positive emotions such as enjoyment, interest, and amusement relate to different personality characteristics and life outcomes.

Another limitation of our study is the exclusive focus on women. Women tend to be more emotionally expressive (see Ekman, 1972; LaFrance & Banaji, 1992) and, in one relevant study, were found to smile more and with greater intensity in high school and university yearbook photographs (Ragan, 1982). Smiling in photos appears to be more variable for men and, therefore, may be more predictive of personality, social impact, and life outcomes. However, smiling may have different implications for men's lives (e.g., Stoppard & Gruchy, 1993). A study of male West Point graduates found that smiling, as a counterindicator of facial dominance, was a negative predictor of favorable life outcomes for men, such as higher military attainment and having more children (Mueller & Mazur, 1996). In contrast, a study by Carstensen et al. (1995) on emotional expression during discussions of marital conflict found that, although women displayed more positive emotion than men, these displays predicted favorable marital outcomes for both sexes. Clearly, sex differences in positive emotional expression, and the attendant implications for individuals' lives, warrant further study.

Finally, the nature of the longitudinal design allowed us to say little about the specific processes by which positive emotional expression influences the life course. We take heart in the fact that our findings dovetail nicely with the work of other researchers who are studying the more immediate effects of positive expression in interactions (e.g., Gottman et al., 1998). Yet, important questions remain unanswered. Most notably, our evidence cannot determine whether it is positive expression or experience that brings about the constellation of outcomes that we observed. It may be that the women who smiled in intense fashion may consistently experience more positive emotion, and it is this disposition to experience emotion that accounted for their personality ratings and life out-

comes. Research that more carefully measures experience and expression contemporaneously could address this issue.

Conclusion

This study contributes to psychology's growing interest in the importance of positive emotions. We followed the life trajectories of women who varied in their expression of positive emotion. Consistent with recent theorizing, we found that individual differences in positive emotional expression were linked to personality stability and development across adulthood, the impressions and reactions from other people, and marital satisfaction and personal well-being up to 30 years later. People photograph each other with casual ease and remarkable frequency, usually unaware that each snapshot may capture as much about the future as it does the passing emotions of the moment.

References

- Allik, J., & Realo, A. (1997). Emotional experience and its relation to the five-factor model in Estonian. *Journal of Personality, 65*, 625-647.
- Barrett, K. C., & Campos, J. J. (1987). Perspectives on emotional development II: A functionalist approach to emotions. In J. D. Osofsky (Ed.), *Handbook of infant development* (2nd ed., pp. 555-578). New York: Wiley-Interscience.
- Bem, D. J., & Allen, A. (1974). On predicting some of the people some of the time: The search for cross-situational consistencies in behavior. *Psychological Review, 81*, 506-520.
- Bentler, P. M., & Newcomb, M. D. (1978). Longitudinal study of marital success and failure. *Journal of Consulting and Clinical Psychology, 46*, 1053-1070.
- Berry, D. S., & Hansen, J. S. (1996). Positive affect, negative affect, and social interaction. *Journal of Personality and Social Psychology, 71*, 796-809.
- Berry, D. S., & Willingham, J. K. (1997). Affective traits, responses to conflict, and satisfaction in romantic relationships. *Journal of Research in Personality, 31*, 564-576.
- Block, J. (1978). *The Q-sort method in personality assessment and psychiatric research*. Palo Alto, CA: Consulting Psychologists Press.
- Bonanno, G. A., & Keltner, D. (1997). Facial expressions of emotion and the course of conjugal bereavement. *Journal of Abnormal Psychology, 106*, 126-137.
- Borkenau, P., & Liebler, A. (1992). Trait inferences: Sources of validity at zero acquaintance. *Journal of Personality and Social Psychology, 62*, 645-657.
- Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences, 12*, 1-49.
- Campos, J. J., Barrett, K. C., Lamb, M. E., Goldsmith, H. H., & Sternberg, C. (1983). Socioemotional development. In P. H. Mussen (Series Ed.) & M. M. Haith & J. J. Campos (Vol. Eds.), *Handbook of child psychology: Vol. 2. Infancy and developmental biology* (pp. 783-915). New York: Wiley.
- Carstensen, L. L., Gottman, J. M., & Levenson, R. W. (1995). Emotional behavior in long-term marriage. *Psychology and Aging, 10*, 140-149.
- Caspi, A., Elder, G., & Bem, D. J. (1987). Moving against the world: Life-course patterns of explosive children. *Developmental Psychology, 23*, 308-313.
- Cooper, H., Okamura, L., & Gurka, V. (1992). Social activity and subjective well-being. *Personality and Individual Differences, 13*, 573-583.
- Cunningham, M. R. (1988a). Does happiness mean friendliness? Induced mood and heterosexual self-disclosure. *Personality and Social Psychology Bulletin, 14*, 283-297.

- Cunningham, M. R. (1988b). What do you do when you're happy or blue? Mood, expectancies, and behavioral interests. *Motivation and Emotion, 12*, 309–331.
- Darwin, C. (1965). *The expression of the emotions in man and animals*. London: University of Chicago Press. (Original work published 1872)
- Diener, E., & Larsen, R. J. (1984). Temporal stability and cross-situational consistency of affective, behavioral, and cognitive responses. *Journal of Personality and Social Psychology, 47*, 871–883.
- Diener, E., Smith, H., & Fujita, F. (1995). The personality structure of affect. *Journal of Personality and Social Psychology, 69*, 130–141.
- Diener, E., Wolsic, B., & Fujita, F. (1995). Physical attractiveness and subjective well-being. *Journal of Personality and Social Psychology, 69*, 120–129.
- Dion, K., Berscheid, E., & Walster, E. (1972). What is beautiful is good. *Journal of Personality and Social Psychology, 24*, 285–290.
- Edwards, A. L. (1957). *The social desirability variable in personality assessment and research*. New York: Dryden.
- Ekman, P. (1972). Universals and cultural differences in facial expressions of emotion. In J. Cole (Ed.), *Nebraska Symposium on Motivation* (Vol. 19, pp. 207–283). Lincoln: University of Nebraska Press.
- Ekman, P. (1992). An argument for basic emotions. *Cognition and Emotion, 6*, 169–200.
- Ekman, P. (1993). Facial expression and emotion. *American Psychologist, 48*, 384–392.
- Ekman, P., & Friesen, W. V. (1976). Measuring facial movement. *Journal of Environmental Psychology and Nonverbal Behavior, 1*, 56–75.
- Ekman, P., & Friesen, W. V. (1978). *Facial Action Coding System: A technique for the measurement of facial movement*. Palo Alto, CA: Consulting Psychologists Press.
- Ekman, P., Friesen, W., & O'Sullivan, M. (1988). Smiles when lying. *Journal of Personality and Social Psychology, 54*, 414–420.
- Emmons, R. A., & Diener, E. (1985). Personality correlates of subjective well-being. *Personality and Social Psychology Bulletin, 11*, 89–97.
- Emmons, R. A., & Diener, E. (1986). An interactional approach to the study of personality and emotion. *Journal of Personality, 54*, 371–384.
- Epstein, S. (1983). Aggregation and beyond: Some basic issues on the prediction of behavior. *Journal of Personality, 51*, 360–392.
- Feingold, A. (1990). Gender differences in effects of physical attractiveness on romantic attraction: A comparison across five research paradigms. *Journal of Personality and Social Psychology, 59*, 981–993.
- Feingold, A. (1992). Good-looking people are not what we think. *Psychological Bulletin, 111*, 304–341.
- Frank, M. G., Ekman, P., & Friesen, W. V. (1993). Behavioral markers and recognizability of the smile of enjoyment. *Journal of Personality and Social Psychology, 64*, 83–93.
- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology, 2*, 300–319.
- Fredrickson, B. L., & Levenson, R. W. (1998). Positive emotions speed recovery from the cardiovascular sequelae of negative emotions. *Cognition and Emotion, 12*, 191–220.
- Fridlund, A. J. (1992). The behavioral ecology and sociality of human faces. *Review of Personality and Social Psychology, 13*, 90–121.
- Frijda, N. H., & Mesquita, B. (1994). The social roles and functions of emotions. In S. Kitayama & H. R. Markus (Eds.), *Emotion and culture: Empirical studies of mutual influence* (pp. 51–87). Washington, DC: American Psychological Association.
- Funder, D. C., & Sneed, C. D. (1993). Behavioral manifestations of personality: An ecological approach to judgmental accuracy. *Journal of Personality and Social Psychology, 64*, 479–490.
- Goldsmith, H. H. (1993). Temperament: Variability in developing emotion systems. In M. Lewis & J. M. Haviland (Eds.), *Handbook of emotions* (pp. 353–364). New York: Guilford Press.
- Gottman, J. M., Coan, J., Carrere, S., & Swanson, C. (1998). Predicting marital happiness and stability from newlywed interactions. *Journal of Marriage and the Family, 60*, 5–22.
- Gottman, J. M., & Levenson, R. W. (1992). Marital processes predictive of later dissolution: Behavior, physiology, and health. *Journal of Personality and Social Psychology, 63*, 221–233.
- Gough, H. G. (1987). *The California Psychological Inventory administrative guide*. Palo Alto, CA: Consulting Psychologists Press.
- Gough, H. G., & Bradley, P. (1996). *The California Psychological Inventory manual* (3rd ed.). Palo Alto, CA: Consulting Psychologists Press.
- Gough, H. G., Bradley, P., & Bedeian, A. C. (1996). *ACL scales for Tellegen's three higher-order traits*. Unpublished manuscript.
- Gough, H. G., & Heilbrun, A. B., Jr. (1983). *The Adjective Check List manual* (1980 ed.). Palo Alto, CA: Consulting Psychologists Press.
- Gross, J. J., Sutton, S. K., & Ketelaar, T. (1998). Relations between affect and personality: Support for the affect-level and affective-reactivity views. *Personality and Social Psychology Bulletin, 24*, 279–288.
- Hathaway, S. R., & McKinley, J. C. (1943). *Manual for the Minnesota Multiphasic Personality Inventory*. New York: Psychological Corporation.
- Haviland, J. M., & Lelwica, M. (1987). The induced affect response: Ten-week-old infants' responses to three emotion expressions. *Developmental Psychology, 23*, 97–104.
- Helson, R. (1967). Personality characteristics and developmental history of creative college women. *Genetic Psychology Monographs, 76*, 205–256.
- Helson, R. (1985). Which of those young women with creative potential became productive?: Personality in college and characteristics of parents. In R. Hogan & W. H. Jones (Eds.), *Perspectives in personality* (Vol. 1, pp. 49–80). Greenwich, CT: JAI Press.
- Helson, R., & Klohnen, E. (1998). Affective coloring of personality from young adulthood to midlife. *Personality and Social Psychology Bulletin, 24*, 241–252.
- Helson, R., Mitchell, V., & Moane, G. (1984). Personality and patterns of adherence and nonadherence to the social clock. *Journal of Personality and Social Psychology, 46*, 1079–1096.
- Helson, R., & Roberts, B. (1992). The personality of young adult couples and wives' work patterns. *Journal of Personality, 60*, 575–597.
- Henley, N. M., & LaFrance, M. (1984). Gender as culture: Difference in dominance in nonverbal behavior. In A. Wolfgang (Ed.), *Nonverbal behavior: Perspectives, applications, intercultural insights* (pp. 351–371). Lewiston, NY: Hogrefe & Huber.
- Hess, U., Banse, R., & Kappas, A. (1995). The intensity of facial expression is determined by underlying affective state and social situation. *Journal of Personality and Social Psychology, 69*, 280–288.
- Isen, A. M. (1987). Positive affect, cognitive processes, and social behavior. *Advances in Experimental Social Psychology, 20*, 203–253.
- Izard, C. E. (1993). Organizational and motivational functions of discrete emotions. In M. Lewis & J. M. Haviland (Eds.), *Handbook of emotions* (pp. 631–641). New York: Guilford Press.
- Izard, C. E., Libero, D. Z., Putnam, P., & Haynes, O. M. (1993). Stability of emotion experiences and their relations to traits of personality. *Journal of Personality and Social Psychology, 64*, 847–860.
- John, O. P. (1990). The "Big Five" factor taxonomy dimensions of personality in the natural language and in questionnaires. In L. A. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 66–100). New York: Guilford Press.
- Kaner, A. (1994). *Physical attractiveness and women's lives: Findings from a longitudinal study*. Unpublished doctoral dissertation, University of California, Berkeley.
- Keating, C. F., Mazur, A., Segall, M. H., Cysneiros, P. G., Divale, W. T., Kilbride, J. E., Komin, S., Leahy, P., Thurman, B., & Wirsing, R. (1981). Culture and the perception of social dominance from facial expression. *Journal of Personality and Social Psychology, 40*, 615–626.
- Kelly, E. L., & Contey, J. J. (1987). Personality and compatibility: A

- prospective analysis of marital stability and marital satisfaction. *Journal of Personality and Social Psychology*, 52, 27–40.
- Keltner, D. (1995). Signs of appeasement: Evidence for the distinct displays of embarrassment, amusement, and shame. *Journal of Personality and Social Psychology*, 68, 441–454.
- Keltner, D. (1996). Facial expressions of emotion and personality. In C. Magai & S. H. McFadden (Eds.), *Handbook of emotion, adult development, and aging* (pp. 385–401). New York: Academic Press.
- Keltner, D., & Bonanno, G. A. (1997). A study of laughter and dissociation: Distinct correlates of laughter and smiling during bereavement. *Journal of Personality and Social Psychology*, 73, 687–702.
- Keltner, D., & Kring, A. (1998). Emotion, social function, and psychopathology. *Review of General Psychology*, 2, 320–342.
- LaFrance, M., & Banaji, M. (1992). Toward a reconsideration of the gender–emotion relationship. *Review of Personality and Social Psychology*, 14, 178–201.
- Larsen, R. J., & Ketelaar, T. (1991). Personality and susceptibility to positive and negative emotional states. *Journal of Personality and Social Psychology*, 61, 132–140.
- Levenson, R. W. (1988). Emotion and the autonomic nervous system: A prospectus for research on autonomic specificity. In H. L. Wagner (Ed.), *Social psychophysiology and emotion: Theory and clinical applications* (pp. 17–42). Chichester, England: Wiley.
- Levine, S. P., & Feldman, R. S. (1997). Self-presentational goals, self-monitoring, and non-verbal behavior. *Basic and Applied Social Psychology*, 19, 505–518.
- Magai, C., & Hunziker, J. (1993). Tolstoy and the riddle of developmental transformation: A lifespan analysis of the role of emotions in personality development. In M. Lewis & J. M. Haviland (Eds.), *Handbook of emotions* (pp. 247–259). New York: Guilford Press.
- Malatesta, C. Z. (1990). The role of emotions in the development and organization of personality. In R. A. Thompson (Ed.), *Nebraska Symposium on Motivation: Vol. 36. Socioemotional development* (pp. 1–56). Lincoln: University of Nebraska Press.
- Matsumoto, D., & Kudoh, T. (1993). American–Japanese cultural differences in attributions of personality based on smiles. *Journal of Non-verbal Behavior*, 17, 231–243.
- McCrae, R. R., & Costa, P. T. (1990). *Personality in adulthood*. New York: Guilford Press.
- McCrae, R. R., & Costa, P. T. (1991). Adding Liebe und arbeit: The full five factor model and well-being. *Personality and Social Psychology Bulletin*, 17, 227–232.
- Mueller, U., & Mazur, A. (1996). Facial dominance in *homo sapiens* as honest signaling of male quality. *Behavioral Ecology*, 8, 569–579.
- Myers, D. G., & Diener, E. (1995). Who is happy? *Psychological Science*, 6, 10–19.
- Pavot, W., Diener, E., & Fujita, F. (1990). Extraversion and happiness. *Personality and Individual Differences*, 11, 1299–1306.
- Pervin, L. A. (1993). Affect and personality. In M. Lewis & J. M. Haviland (Eds.), *Handbook of emotions* (pp. 301–311). New York: Guilford Press.
- Plutchik, R. (1984). Emotions: A general psychoevolutionary theory. In K. R. Scherer & P. Ekman (Eds.), *Approaches to emotion* (pp. 197–219). Hillsdale, NJ: Erlbaum.
- Ragan, J. M. (1982). Gender displays in portrait photographs. *Sex Roles*, 8, 33–43.
- Reis, H. T., Wheeler, L., Spiegel, N., Kernis, M. H., Nezelek, J., & Perri, M. (1982). Physical attractiveness in social interaction: II. Why does appearance affect social experience? *Journal of Personality and Social Psychology*, 43, 979–996.
- Ruch, W. (1993). Exhilaration and humor. In M. Lewis & J. M. Haviland (Eds.), *Handbook of emotions* (pp. 605–616). New York: Guilford Press.
- Schmutte, P. S., & Ryff, C. D. (1997). Personality and well-being: Reexamining methods and meanings. *Journal of Personality and Social Psychology*, 73, 549–559.
- Sperduto, G. R., Calhoun, K. S., & Ciminerio, A. R. (1978). The effects of reciprocal reactivity on positively and negatively valenced behaviors. *Behavior Research and Therapy*, 16, 429–434.
- Stoppard, J. M., & Gruchy, C. D. G. (1993). Gender, context, and expression of positive emotion. *Personality and Social Psychology Bulletin*, 19, 143–150.
- Tellegen, A. (1985). Structures of mood and personality and their relevance to assessing anxiety, with an emphasis on self-report. In A. Hussain Tuma & J. D. Maser (Eds.), *Anxiety and the anxiety disorders* (pp. 681–706). Hillsdale, NJ: Erlbaum.
- Termine, N. T., & Izard, C. E. (1988). Infants' responses to their mothers' expressions of joy and sadness. *Developmental Psychology*, 24, 223–229.
- Thorne, A. (1987). The press of personality: A study of conversations between introverts and extraverts. *Journal of Personality and Social Psychology*, 53, 718–726.
- Watson, D. (1988). Intraindividual and interindividual analyses of positive and negative affect: Their relation to health complaints, perceived stress, and daily activities. *Journal of Personality and Social Psychology*, 54, 1020–1030.
- Watson, D., & Clark, L. (1992). On traits and temperament: General and specific factors of emotional experience and their relation to the five-factor model. *Journal of Personality*, 60, 441–476.
- Watson, D., Clark, L., McIntyre, C. W., & Hamaker, S. (1992). Affect, personality, and social activity. *Journal of Personality and Social Psychology*, 63, 1011–1025.
- Watson, D., & Walker, L. M. (1996). The long-term stability and predictive validity of trait measures of affect. *Journal of Personality and Social Psychology*, 70, 567–577.
- Wink, P., & Helson, R. (1993). Personality change in women and their partners. *Journal of Personality and Social Psychology*, 65, 597–606.

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