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Happiness, excellence, and optimal human functioning revisited: Examining the peer-reviewed literature linked to positive psychology

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Happiness, excellence, and optimal human functioning revisited: Examining the peer-reviewed literature linked to positive psychology

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Since the original call by Seligman and Csikszentmihalyi (2000) for a new science of happiness, excellence, and optimal human functioning, there has been an explosion of activity in, acclaim for, and criticism of positive psychology. The purpose of this study was to identify and examine the peer-reviewed literature linked to the positive psychology movement. An extensive systematic review identified 1336 articles published between 1999 and 2013. More than 750 of these articles included empirical tests of positive psychology theories, principles, and interventions. The results show a fairly consistent increase in the rate of publication, and that the number of empirical studies has grown steadily over the time period. The findings demonstrate that positive psychology is a growing and vibrant sub-area within the broader discipline of psychology, committed to using the same rigorous scientific methods as other sub-areas, in pursuit of understanding well-being, excellence, and optimal human functioning.

Keywords: positive psychology; happiness; well-being; optimal functioning; literature review

The early beginnings of positive psychology can be traced to the APA Presidential Address by Martin Seligman in 1998. Seligman called for psychological researchers to loosen their grip on the almost exclusive focus on human pathology, and to devote at least some of their attention to the positive features of human existence that make life worth living. Seligman and Csikszentmihalyi (2000) amplified that call in a special issue of the American Psychologist on Happiness, Excellence, and Optimal Human Functioning. They outlined a framework for a new science of positive psychology and invited a wide range of leading psychological scientists to address the scientific basis of topics such as the evolution and predictors of happiness (Buss, 2000), subjective well-being (Diener, 2000), optimism (Peterson, 2000), self-determination (Ryan & Deci, 2000), wisdom (Baltes & Staudinger, 2000), creativity (Simonton, 2000), giftedness (Winner, 2000), states of excellence (Lubinski & Benbow, 2000), and positive youth development (Larson, 2000), among others. Seligman and Csikszentmihalyi (2000) provided a vision intended to inspire others to help build a science and profession that will come to understand how best to facilitate individual, community, organizational, and societal flourishing.

Now that nearly 15 years have passed it is possible to ask and answer the question ‘was anybody listening to this call?’ Was the call and framework for a science of positive psychology compelling enough to inspire action? If so, what is the nature and extent of that action? These questions motivated us to seek and discover an impressive array of scholarly activity including a wealth of peer-reviewed journal articles, books, grants, generous prizes and awards, conferences, a new Journal of Positive Psychology, and growing number of professional associations including the International Positive Psychology Association. This rapid development of an evidence base has fueled the growth of nearly 20 new graduate programs across the world including two large and well-established programs at University of Pennsylvania and Claremont Graduate University. Equally impressive is the influence positive psychology has had on other fields by inspiring positive scholarship in education, public health, political science, economics, neuroscience, social services, management, leadership, the organizational sciences, and the like (Donaldson, Csikszentmihalyi, & Nakamura, 2011).

Common among all these scholarly pursuits is the shared understanding of what constitutes positive psychology. Positive psychology is seen as the science of positive subjective experience, positive individual traits, and positive institutions (Seligman & Csikszentmihalyi, 2000). In this sense, the field provides new topics of investigation as well as new ways of thinking about existing constructs within the scientific study of psychological processes and human behavior. A core foundational belief shared among most positive psychologists is that humans strive to lead meaningful, happy, and good lives. In doing so, the field spans across multiple areas and can be applied in a variety of contexts including schools, communities, work, and family life. The
Positive psychology is founded on the belief that people want to lead meaningful and fulfilling lives, to cultivate what is best within themselves, and to enhance their experiences of love, work, and play. Positive Psychology has three central concerns: positive emotions, positive individual traits, and positive institutions. Understanding positive emotions entails the study of contentment with the past, happiness in the present, and hope for the future. Understanding positive individual traits consists of the study of the strengths and virtues, such as the capacity for love and work, courage, compassion, resilience, creativity, curiosity, integrity, self-knowledge, moderation, self-control, and wisdom. Understanding positive institutions entails the study of the strengths that foster better communities, such as justice, responsibility, civility, parenting, nurturance, work ethic, leadership, teamwork, purpose, and tolerance.

Further, some of the goals include building a science that supports families, schools, workplaces, and communities to flourish.

This relatively new field of positive psychology provides a fresh lens through which to examine human behavior in various aspects of work and non-work life across the entire human lifespan. It is assumed that the same scientific rigor and methods characteristic to the field of psychology in general, are also used to study human behavior through the positive psychology lens. However, several voices of criticism have been raised in the past few years about the foundation of positive psychology. The main areas of criticism center on: (1) the theoretical and conceptual basis (e.g. Fineman, 2006) and (2) the methodological and empirical rigor used in positive psychology research (e.g. Lazarus, 2003). The main concerns from a theoretical or conceptual point of view primarily refer to criticisms regarding the lack of novelty in positive psychology concepts (history in the remaking), an overemphasis on the positive accompanied by a lack of attention to the negative side of certain constructs, and finally, the individualistic bias of many concepts within positive psychology that may not be universally applicable and transferable into collectivist cultures (e.g. Becker & Marecek, 2008; Christopher & Hickinbottom, 2008; Hackman, 2009). From a methodological standpoint, critics claim that there is a lack of scientific and empirical rigor in the field specifically concerning the operationalization and construct validity of variables and scales, as well as the design of intervention studies (e.g. Sugarman, 2007; Suissa, 2008).

These critiques call for a review of the peer-reviewed scientific literature to examine whether Seligman and Csikszentmihalyi’s appeal almost 15 years ago was truly heard and answered appropriately. Seligman, Steen, Park, and Peterson (2005) began this effort by taking stock of the effectiveness of positive psychology interventions. They found that positive psychology interventions canlastingly increase happiness and decrease depressive symptoms. Borrego and Jiménez (2009), Schui and Krampen (2010), and Hart and Sasso (2011) all found a steady increase over time in the number of documents in the PsycINFO® database using the key term ‘positive psychology.’ Similar increases in the number of positive psychology-related publications were found in organizational (Donaldson & Ko, 2010), educational (Froh, Huebner, Youssef, & Conte, 2011), and health psychology (Schmidt, Raque-Bogdan, Piontkowski, & Schaefer, 2011). Finally, Rusk and Waters (2013) recently found over 18,000 PsycINFO® documents linked to 233 search terms related to topics in positive psychology. While these previous reviews have been helpful in documenting the growth and impact of positive psychology in general, as well as in various subfields, they have not addressed concerns about the peer-reviewed empirical foundations of positive psychology.

Study purpose

In light of positive psychology’s rapid growth, potential to provide a fresh lens for the study of human behavior, and recognition of the criticisms, the purpose of this investigation is to consider the work that uses positive psychology as a framework and determines the scientific evidence that has been accumulated since the movement began. Other recent reviews of the field have loosened their inclusion criteria so that studies examined are not necessarily peer-reviewed or explicitly linked to the positive psychology movement. For example, many of the 18,000 documents identified by Rusk and Waters (2013) are linked to topics related to positive psychology but are not limited to peer-reviewed articles that explicitly refer to positive psychology. Establishing a tighter boundary is important for the current study because we are interested in evaluating the scientific progress of positive psychology, not work done by authors on related topics who do not identify with, or possibly even know much about, the positive psychology movement or literature. Finally, this study provides a deeper review of the concepts, research, and interventions applied within a positive psychology framework, and it includes a large span of sub-areas as well as topics applicable to the full human lifespan. The following section discusses the methods used to conduct an extensive review of peer-reviewed articles published as part of the positive psychology movement.
Method

Literature search

An extensive literature search was conducted to capture all peer-reviewed articles linked to the field of positive psychology, produced since its inception in 1999 up to 2013. The literature search was conducted through the Academic Search™ Premier, Business Source Premier®, ERIC®, PsycINFO®, and PsycARTICLES®. The search term ‘positive psychology’ was used and results were limited to articles published in English peer-reviewed academic journals. Articles were excluded if they were: (1) book reviews, commentaries, or editorials, (2) not explicitly related to positive psychology, and (3) not available in full text. The final database consisted of 1336 articles embedded within the field of positive psychology, published in English peer-reviewed journals between 1999 and 2013.

Coding

All articles were coded by a team of seven well-trained raters using a systematic coding scheme that was developed to include key information from the publications. This involved closely examining the abstract and keywords of each article, and in-depth content analysis of the hypotheses, method, analyses, results, and discussion sections for each empirical study. From this, codes for primary categories were generated and used for frequency analysis. The coding categories were discussed, ambiguities or concerns were regularly addressed, and codes were revised as necessary to ensure clear understanding and coding by each coder. The final coding scheme included: (1) information on the author(s) (e.g. affiliation, institution, country), (2) publication information (e.g. year, article title, journal title), (3) article type (e.g. empirical vs. non-empirical), (4) study variables (e.g. independent variables, dependent variables, moderators), (5) theory/model, (6) data collection methods (e.g. environment, design, sampling), (7) measures used, (8) sample characteristics (e.g. size, age, gender, race/ethnicity, occupation, location), and (9) data analysis procedures.

An inter-rater reliability analysis was conducted on a sample of 36 empirical articles for the most complex and critically relevant coding categories. These categories were identified by the coders as the most ambiguous and difficult to code. In addition, these categories included information on the methods and designs used in empirical studies and were therefore, important for analyses and conclusions. A total of 15 categories were coded in the inter-rater reliability process, including categories such as study variables, data collection environment (e.g. field vs. laboratory), method type (e.g. quantitative vs. qualitative and survey vs. interview), design type (correlation vs. experimental and cross-sectional vs. longitudinal), sampling procedure, level of analysis, and analysis procedure.

Each article was assigned to two coders who independently coded the article; the codes were compared and the percentage of coder agreement was calculated. This yielded an inter-rater reliability of 90.1% across all articles and categories. As this did not include simple coding categories that are likely to be 100% unanimous among all coders (e.g. author’s name, year of publication, title of journal) in the inter-rater reliability analysis, the calculated 90.1% agreement is a conservative estimate of the level of agreement among the coders across all articles.

Analysis

The whole data-set of 1336 articles was analyzed to investigate the number of articles published in positive psychology until 2013; the production of publications by countries, authors, and institutions; the number and types of empirical and non-empirical articles; the methods and samples used in empirical studies; the main topics investigated; and key findings that have emerged from the literature. A combination of frequency analyses, descriptive statistics, and content analyses were conducted to address these research questions.

Results

Overall findings

Number and type of publications

Of the 1336 articles published between 1999 and 2013, 565 (42%) were non-empirical and 771 (58%) empirical. As Figure 1 illustrates, five distinct periods have larger than normal increases in publications by at least 20 articles – from 2003 (n = 29) to 2004 (n = 60), from 2005 (n = 61) to 2006 (n = 88), from 2007 (n = 89) to 2008 (n = 143), from 2011 (n = 142) to 2012 (n = 165), and from 2012 (n = 165) to 2013 (n = 232). As these increases are similar for empirical and non-empirical publications, these periods may mark major advancements either because of new theory formation or empirical findings that led to subsequent publications that spurred growth in the field.

However, the total number of publications plateaus around 140–144, from 2008 until 2011, with another spike in 2012 and in 2013. As can be expected in a new field, more conceptual and theoretical articles were produced than empirical studies in the initial years of its development. This trend changed in 2006 when equal number of empirical and conceptual articles (n = 44) were produced. Ever since, the empirical publications have outnumbered non-empirical, with the largest number of empirical articles (n = 166) published in 2013 – the last year included in this review.
The countries and institutional affiliations of first authors were mapped out and examined. Of the 1320 publications that identified the first authors’ geographic location, 55.2% \( (n = 729) \) were published in the US, 9.1% \( (n = 120) \) in the UK, 5.7% \( (n = 75) \) in Australia, and 5.5% \( (n = 73) \) in Canada. Thus, 77% of all articles were published in predominantly English-speaking Western countries. The others were published in one of 46 countries in Europe, Asia, or Africa including The Netherlands, Russia, Germany, Spain, China, Israel, and South Africa. Review of the first authors’ institutional affiliations revealed that University of Pennsylvania had produced the most publications \( (n = 33) \), followed by University of Michigan \( (n = 27) \), University of Kansas \( (n = 20) \), University of Zurich \( (n = 19) \), University of Sydney \( (n = 16) \), and University of Warwick \( (n = 16) \).

Key topics
All 1336 articles were analyzed using frequency and content analysis to identify the main topics in the literature. Well-being was the most investigated concept in the database \( (n = 339, 25.4\%) \). Character strengths were also frequently investigated \( (n = 70) \), followed by hope \( (n = 63) \), gratitude \( (n = 41) \), resilience \( (n = 39) \), and growth \( (n = 34) \).

Non-empirical findings
Types of articles
Each article in the data-set was coded for whether it was a (a) theoretical article presenting a different or new concept, argument, or theory, (b) review article summarizing previous findings on existing concepts, or (c) critique describing the strengths and limitations of the field as a whole. Analysis revealed that 64.8% of the non-empirical articles \( (n = 565) \) were theoretical \( (n = 366) \), followed by review articles, i.e. 26% \( (n = 147) \), and critiques, i.e. 9.2% \( (n = 52) \).

Areas covered
Further analysis revealed that four key applied domains were covered within the overall field. Most articles pertained either to positive clinical/counseling psychology, positive organizational psychology, positive school psychology, or positive youth psychology. Thus, the non-empirical developments in positive psychology expand across the human lifespan including children, adolescents, and adults. Furthermore, conceptual contributions touch upon a variety of important settings such as school, work, and clinical settings. Interestingly, each of these areas was evenly represented in the non-empirical data-set, indicating that the positive psychology movement has engaged the interest of thought leaders and scholars across these disciplines.

Empirical findings
Next, empirical studies and types of methods, designs, and samples, constructs and variables were investigated, and key findings were examined. Further, the types of positive psychology interventions conducted and their relative effectiveness were also assessed.
Study method and design
A frequency analysis indicates that of the 771 empirical articles, 78% \((n = 601)\) used quantitative methods for data collection and analysis, 10.5% \((n = 71)\) used a mixed-methods approach, combining quantitative and qualitative methods, and fewer \((n = 89; 11.5\%)\) employed only qualitative methods. Analysis of the study designs indicates that 77% \((n = 596)\) of the empirical studies used a cross-sectional design, 13.6% \((n = 105)\) used a longitudinal design, and 9.1% \((n = 70)\) used repeated cross-sectional design. Taken together, these findings indicate that the research in positive psychology to date has largely been quantitative and based on cross-sectional designs.

Samples
Based on the demographic characteristics of the samples used in the empirical research most studies could be organized as: (1) children and adolescents aged 18 and younger, (2) college/graduate students, and (3) other adults. Specifically, 39% of the empirical articles used college or graduate school student samples, followed by 35% of articles that used samples of adults, often in the work context, and 16% engaged children or adolescents, while 10% did not specify.

Key outcome variables
In order to examine the main topics investigated in the empirical research, a frequency analysis was conducted on the dependent variables studied in the articles. The findings indicated that a large number of the empirical articles \((n = 339)\) investigated well-being or one of its subcomponents as the outcome variable. These studies investigated constructs such as gratitude, mindfulness/meditation, strengths, coaching, hope, or spirituality, as key predictors of well-being. Thus, considerable research to date focuses on factors that predict a happy and satisfying life. In contrast, a total of 31 empirical articles examined performance as a key outcome variable. Some of the key constructs investigated as predictors of performance were PsyCap, well-being, self-discipline, hardness, hope, and passion. The next most studied outcome variable was growth \((n = 34)\), predicted by coping, spirituality, or emotional expression, among others.

Findings related to well-being
In-depth review of studies on well-being revealed a lack of consistency in definition and measurement of well-being as a construct, and the terms well-being, life satisfaction, and happiness were often used interchangeably. Overall, 31 different scales were used to assess well-being or its aspects. However, key studies (e.g., Gallagher & Lopez, 2009) published in influential journals (e.g., The Journal of Positive Psychology) discussed its varying definitions and established congruity in conceptualizing and operationalizing well-being. The consensus is that well-being is a multidimensional latent construct that consists of hedonic and eudaimonic components (e.g., Delle Fave, Brdar, Freire, Vella-Brodrick, & Wissing, 2011).

The hedonic component (subjective well-being) stems from initial research by Diener, Emmons, Larsen, and Griffin (1985) and is conceptualized as the experience of positive emotions and the absence of negative emotions, as well as an overall evaluation of one’s life satisfaction. In later studies (see Sheldon & Lyubomirsky, 2006), happiness is defined as the affective aspect of hedonic well-being, and life satisfaction as the cognitive aspect. The eudaimonic component, referred to as psychological well-being, is conceptualized as the search and attainment of meaning, self-actualization, and personal growth (Ryff, 1989).

Predictors of well-being
Examination of the common predictors of well-being and its subcomponents revealed 16 studies on the relationship between gratitude and well-being. Findings indicated that reflecting on positive experiences as well as reframing events towards compassion and gratitude increased well-being (Watkins, Cruz, Holben, & Kolts, 2008). Further, gratitude and forgiveness led to increased affective and cognitive well-being (Toussaint & Friedman, 2009). These studies found gratitude to be related to well-being with correlations ranging from \(r = 0.14\) to \(r = 0.49\).

Several studies \((n = 11)\) found the practice of mindfulness or meditation to be related to emotions. Loving-kindness meditation was found to produce long-term increases in positive emotions (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008), while mindfulness was related to decrease in levels and frequency of negative emotions (Jislin-Goldberg, Tanay, & Bernstein, 2012).

Another key predictor of well-being was character strengths \((n = 12)\). Findings suggest that identifying one’s strengths and utilizing them can positively influence one’s hedonic and eudaimonic well-being.

Coaching, another predictor of well-being included studies \((n = 9)\) on the effects of participation in coaching interventions. These studies will be described in further detail later, in the section on intervention studies.

Hope was investigated as a predictor of well-being in four studies. Overall, high levels of hope were related to life satisfaction across the lifespan (Bronk, Hill, Lapsley, Talib, & Finch, 2009), and despite cognitive disabilities (Shogren, Lopez, Wehmeyer, Little, & Pressgrove, 2006).
Finally, five empirical studies investigated spirituality as a predictor of well-being. Faith-related practices were found to have a positive impact on affect by decreasing emotional distress (Ai, Tice, Peterson, & Huang, 2005). Further, positive religious beliefs were positively correlated with positive affect, while negative religious coping was positively related with negative affect (Ciarrocchi & Breisford, 2009).

In sum, these studies demonstrate the breadth of research interests, approaches, and lines of investigation used to uncover what makes individuals happy and satisfied. Findings indicate multiple predictors of well-being, including gratitude, identification and use of personal strengths, use of coaching and meditation interventions, and presence of hope and spirituality.

Findings related to performance
A total of 31 empirical studies investigated performance as an outcome, of which 21 studied this in organizational contexts. Individual performance at work was operationalized as self-rated job performance, manager-rated job performance, or objective performance metrics (e.g. sales). A common predictor of workplace performance was psychological capital (PsyCap), which includes hope, optimism, resilience, and self-efficacy (Avey, Luthans, & Youssef, 2010). Hope, optimism, and resilience were predictive of employee performance as measured by self- and manager-rated performance (Youssef & Luthans, 2007). Overall, the correlations were significant at the $p < 0.001$ level and ranged from $r = 0.14$ to 0.22. In addition, PsyCap mediated the relationship between supportive organizational climate and employee performance (Luthans, Norman, Avolio, & Avey, 2008). Finally, the use of character strengths was also found to be positively related to creative task performance (Avey, Luthans, Hannah, Sweetman, & Peterson, 2012) and positive work behavior (Gander, Proyer, Ruch, & Wyss, 2012).

Seven studies examined predictors of school performance, operationalized mostly as GPA, and less often as standardized test scores or school attendance. Findings revealed that subjective well-being was positively related to GPA ($r = 0.30$), and standardized test scores on reading ($r = 0.23$) and math ($r = 0.24$) (Suldo, Thalji, & Ferron, 2011). Further, self-discipline predicted GPA ($r = 0.67$) and accounted for twice as much variance in predicting academic performance as intelligence (Duckworth & Seligman, 2005). In addition, hardiness also had a positive impact on GPA (Maddi, Harvey, Khoshaba, Fazel, & Resurreccion, 2009).

Finally, in addition to school and work, positive psychology constructs influence performance in areas such as recreation and sports. Hope interventions predicted increase in athletic performance (Rolo & Gould, 2007); passion predicted increase in deliberate practice, leading to enhanced performance among drama students (Vallerand et al., 2007); and emotional intelligence and regulation had a positive impact on sports performance (Wagstaff, Fletcher, & Hanton, 2012). Thus, the empirical research indicates that several positive constructs contribute to superior performance in a variety of aspects of human life.

Findings on growth
Of the empirical articles ($n = 34$) that studied growth, several ($n = 11$) focused on post-traumatic growth, and reiterated that stressful events led to growth under certain conditions. Emotional expression was found to mediate event-related stress and growth (Linley, Felus, Gillett, & Joseph, 2011). Further, positive coping strategies including a positive attitude, hope, and optimism, also predicted growth after stressful life events (Oaksford, Frude, & Cuddihy, 2005). Similarly, spirituality mediated the link between forgiveness and post-traumatic growth after being physically injured by someone (Schultz, Tallman, & Altmaier, 2010).

Intervention studies
Examination of the research on positive interventions indicates that overall 21.3% ($n = 161$) of the empirical studies were intervention studies. Of these, 44 articles used a quasi-experimental and 80 experimental designs, including treatment and control groups, and employing pre- and post-measures. A total of 79 studies used a within-subjects design that included pre- and post-tests; fewer studies ($n = 29$) used a between-subjects design with a comparison group, but without pre- or post-tests; four were case studies. Some of the key findings are described in the subsequent sections (see Table 1).

Mindfulness interventions
Mindfulness is the most studied intervention ($n = 15$) and involves various methods and content, including yoga, mind-body connection, loving-kindness mediation, mindfulness-based cognitive behavior therapy, and stress management wellness programs. Findings indicated that mindfulness can be increased, and this predicted decrease in negative affect (Collard, Avny, & Boniwell, 2008). Intensive mindfulness training programs were related to increase in subjective well-being, self-compassion, and resilience (Orzech, Shapiro, Brown, & McKay, 2009). Similarly, multidimensional weekly wellness group programs had positive effects on stress management, physical health care, and behavioral activation (Perlman et al., 2010).
**Table 1. Summary of key interventions.**

<table>
<thead>
<tr>
<th>Intervention type</th>
<th>Outcomes</th>
<th>Number of studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coaching</td>
<td>Well-being, cognitive hardiness, hope, resilience, engagement, self-motivation, goal attainment, mental health</td>
<td>13</td>
</tr>
<tr>
<td>Mindfulness</td>
<td>Reduced anxiety, well-being, resilience, self-compassion</td>
<td>15</td>
</tr>
<tr>
<td>Positive affect</td>
<td>Improved health, mindfulness, enhanced purpose in life</td>
<td>12</td>
</tr>
<tr>
<td>Strength-based</td>
<td>Personal growth, well-being</td>
<td>10</td>
</tr>
<tr>
<td>Gratitude</td>
<td>Well-being, reduced depression, closure to unpleasant emotional memories, reduced body dissatisfaction</td>
<td>9</td>
</tr>
</tbody>
</table>

**Coaching interventions**

Most coaching interventions ($n = 13$) were rooted in a solution-based cognitive model (Grant & Greene, 2001) and engaged in self-monitoring, cognitive restructuring, and behavior modification to enhance goal achievement. Interventions ranged from 3 to 20 sessions and were conducted in individual and group formats. Findings suggest that interventions may benefit participants in multiple ways and benefits may sustain over time. For instance, coaching was associated with increase in levels of cognitive hardiness and hope, and decrease in levels of depression among female high school students (Green, Grant, & Rynsaardt, 2007). Further, individuals who participated in another coaching program showed increases in goal striving, well-being, and hope, and these gains were maintained up to 30 weeks after the completion of the program (Green, Oades, & Grant, 2006).

Executive coaching focused on self-leadership and transformational leadership, and meeting challenges was found to increase goal attainment, resilience, and workplace well-being, as well as reduce depression and stress (Grant, Curtayne, & Burton, 2009). Coaching was also effective in enhancing self-motivation (Burke & Linley, 2007) and engagement (Madden, 2011).

Thus, coaching interventions influence positive outcomes in a variety of groups such as executive leaders, and high school students, with studies generally reporting medium to large effect sizes when comparing pre- and post-coaching measures on goal attainment ($d = 2.85$), depression, anxiety, stress ($d = 0.82, 0.48, 0.69$), and quality of life ($d = 1.62$).

**Strength-based interventions**

Strength-based intervention studies ($n = 10$) involve identification and targeted practice of strengths. In interventions for rigorous outdoor activities and strengths education, strong links were found between personal growth and strengths awareness ($r = 0.57$), strengths application ($r = 0.42$), and total strengths ($r = 0.50$; Passarelli, Hall, & Anderson, 2010). In general, findings indicate that strength-based interventions are effective in increasing life satisfaction (Proctor et al., 2011), growth (Louis, 2011), and self-awareness (Stebleton, Soria, & Albeck, 2012). Further, longitudinal research indicated that participation in a character strengths intervention by high school students was related to well-being one year later (Gillham et al., 2011). Other-oriented strengths (e.g. forgiveness, kindness) and self-transcendence (e.g. hope, gratitude) were found to be particularly important in enhancing well-being, while more leadership-oriented strengths were less so.

**Affect-based interventions**

Many of the affect-based interventions ($n = 12$) engaged exercises such as writing about positive emotions, watching short video clips, discussing positive experiences, and learning about different emotions, in order to induce positive emotions. Findings revealed that writing about positive emotions was related to enhanced positive mood and fewer instances of illness compared to control groups (Burton & King, 2004). Further, affective interventions that focused on educating participants on emotions and emotion regulation predicted empathy and forgiveness, and decrease in negative emotions (vanOyen Witvliet, Knoll, Hinman, & DeYoung, 2010).

**Gratitude interventions**

Lastly, gratitude interventions ($n = 9$) typically involved writing gratitude letters and diaries. Overall, the findings on gratitude interventions are promising and predict increases in happiness and decreases in depression (e.g. Seligman et al., 2005), increases in well-being (Sergeant & Mongrain, 2011), and closure for unpleasant emotional memories (Watkins et al., 2008).

**Discussion**

Seligman and Csikszentmihalyi provided a vision and suggested a research agenda for positive psychology in their special issue of the *American Psychologist* in 2000. This study has demonstrated that, as a result, there is now an emerging peer-reviewed literature focused on Happiness, Excellence, and Optimal Human Functioning.
While this new field of positive psychology has received an unusually large amount of media attention (Ruark, 2009) and has spawned many articles in the popular press, books, grants, prizes, professional associations, conferences, undergraduate courses, and graduate programs, more than 1300 peer-reviewed scientific articles have also been published between 1999 and 2013. Perhaps, more important in terms of the original call for sound scientific work on positive psychology topics, the number of empirical studies each year has grown over the time period, and in 2013 surpassed peer-reviewed conceptual articles 2.5 (166)–1 (66). We think it is safe to conclude that many psychological researchers have been inspired to investigate topics that illuminate the scientific understanding of factors that enable individuals, communities, and societies to flourish in contemporary times (Seligman & Csikszentmihalyi, 2000).

The characteristics of the peer-reviewed literature to date are now clear. Although over 75% of the research is produced in English-speaking western countries, the scientific literature has recently proliferated internationally across 46 countries. Given that the field was initially seeded and nurtured in the western countries through degree programs, large grants, and dissemination opportunities via journals and conferences, the burgeoning international positive psychology research is a promising development. Overall, most positive psychology theorizing in the non-empirical literature has stemmed evenly from the clinical/counseling psychology, organizational psychology, school psychology, or youth/developmental psychology disciplines. In terms of research methodology, analysis of the empirical research indicates a strong quantitative orientation (78%) and predilection for cross-sectional designs (77%). At least 50% of the studies in positive psychology engage participants outside of college samples, such as children, adolescents, and adults in workplace or other settings, which is an encouraging finding given that past reviews of empirical psychological research across disciplines indicated that college students account for 70% to 90% of the samples in many of the high-impact journals (see Sears, 1986; Sherman, Buddie, Dragan, End, & Finney, 1999).

The most researched topic in positive psychology to date is well-being, accounting for almost 40% more publications than all the other key topics combined, including character strengths, hope, gratitude, resilience, and growth. This research has shown that gratitude, mindfulness, hope, and spirituality, and more generally, identification and use of character strengths predict well-being. Another popular topic of research, particularly in the organizational context, is performance, and several studies suggest that psychological capital (PsyCap; see Donaldson & Dollwet, 2013) is positively related to employee performance. Yet another crucial topic addressed in the empirical research is post-traumatic growth, predicted by emotional expression and positive coping strategies, including positive attitude, hope, optimism, and spirituality.

There is also a growing evidence base on the effectiveness of positive psychology interventions. More than 160 intervention studies were identified and analyzed; and the major categories included coaching, mindfulness, strengths development, positive affect enhancement, and gratitude practice. Empirical evidence was found to link these interventions to increases in well-being, resilience, hardness, engagement, hope, and goal attainment, among other outcomes.

The characteristics of the conceptual and empirical studies in this investigation do not support many of the critics’ claims mentioned previously. For example, all of these articles have made it through a rigorous peer-review process and most appear sound both conceptually and from a methodological standpoint. While it is true that the first wave of empirical research in positive psychology tends to focus on questions that favor quantitative survey research most often cross-sectional in nature at the individual level of analysis, we found evidence that a growing number and range of alternative research questions and designs are being pursued. This pattern is not atypical of the development of similar areas in scientific psychology. However, it is important to point out that the early conceptual work and non-peer-reviewed literature linked to positive psychology may be more likely to be susceptible to the concerns raised about conceptual and scientific rigor, and it is possible that researchers have heeded those critiques in the more recent literature.

**Strengths and limitations**

The purpose of this investigation was to determine what scientific evidence has been accumulated since the positive psychology movement began. This is the first review of the entire field that we know of that isolated the peer-reviewed literature directly linked to positive psychology. While this clear boundary has helped provide useful and meaningful answers to the research questions, some may argue for different boundary settings. For example, studies published on well-being and other topics commonly studied by positive psychologists, were not included unless the phrase ‘positive psychology’ was used in their peer-reviewed article. While this somewhat conservative criterion might have excluded some relevant publications, it also protected against including studies that were not influenced or linked to the positive psychology movement. Another limitation was that our procedures excluded peer-reviewed articles published in languages other than English. As the field develops, future investigations will be more complete if they include positive psychology research published in a variety of languages.
Despite these limitations, this study has provided evidence to address concerns raised about the scientific foundation of positive psychology. More than 1300 positive psychology articles have made it through peer-review processes since the American Psychologist special issue call in 2000 for rigorous positive psychology research. Over 750 of these studies used empirical data to test hypotheses and examine important research questions. The analyses in this paper clearly show that positive psychology is a growing and vibrant sub-area within the broader field of psychology, committed to using the same rigorous scientific methods as other sub-areas, in the pursuit of understanding well-being, excellence, and optimal human functioning (cf. Seligman & Csikszentmihalyi, 2000; Donaldson et al., 2011).

Conclusion
The popularity of the positive psychology movement has garnered both energetic acclaim and harsh criticism. Much of the criticism has been wagered at the scientific basis of many of the claims being made. While the concern may be well founded when restricted to commenting on the vast popular non-peer-reviewed literature, much progress has been made by psychological scientists heeding the call for a science of positive psychology. The growing peer-reviewed scientific literature has much to say about optimal human functioning. Basic research is now being accompanied by intervention research examining the application of positive psychology theories, principles, programs, and policies. Another decade of sound empirical research promises to nudge us closer to the original vision of a better scientific understanding of the key factors that enable individuals, communities, organizations, and societies to flourish.

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References


