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Happiness and productivity: a research synthesis using an online findings archive

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Abstract
The 'happy productive worker' thesis (HPW) holds that the happiness of workers has a positive impact on their productivity. In this study, we take stock of the research findings about the relationship between happiness on the productivity of workers that have been collected in the World Database of Happiness. We considered both objective and subjective productivity measures. In total, we drew on 33 studies that yielded 197 correlational findings over 27 countries and regions. The following questions were addressed: (1) Does happiness have a positive association with productivity? (2) Does the positive association between happiness and productivity differ across sectors and occupations? (3) Which component of happiness relates most to a productive workplace: how well a worker feels most of the time (the affective component) or the degree to which a worker feels able to get what they want from life (the cognitive or evaluative component)? (4) To what extent can we speak of a causal effect of happiness on productivity at work? Overall, the findings provide evidence of a positive relationship between happiness and productivity. The association between happiness and productivity at work differ across occupations and sectors and seems to be particularly strong for the affective component of happiness (how well a worker feels most of the time). More comparison studies are necessary to examine the relative importance of the affective and cognitive component. A causal effect of happiness on productivity is likely to exist but empirical evidence is thin on the ground.

Keywords Affect balance · Happiness · Life satisfaction · Productivity · Research synthesis

JEL Classification I31 · J24 · M5

1 Introduction

Idea that happy workers perform better is known as the 'happy productive worker' (HPW) thesis. This thesis originated from the human relations (HR) movement in the first half of the twentieth century (e.g., Hersey 1932), and it is widely

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accepted today, as manifested in the discussions that are to be found in management books as well as in ongoing HR practices. Happy workers are not only less absent from work and less inclined to quit (Erdogan et al. 2012), but also more productive when they are at work.

1.1 Current focus on job satisfaction

In the literature on happiness and productivity, worker well-being is most often understood in terms of their job satisfaction. Job satisfaction can be defined as an "*evaluative judgment one makes about one's job or job situation*" (Weiss 2002, p. 175) but is in the popular literature also often referred to as '*happiness at work*' (Fisher 2010). Consequently, much research on job satisfaction has been undertaken, focusing not only on the determinants of job satisfaction, but also on the ways in which job satisfaction can be measured. Indeed, in April 2023, a search for 'job satisfaction' on Google Scholar yielded 3.7 million hits.

Alongside the academic work that has been conducted, the evaluative and domain-specific concept of job satisfaction is also a notable focus of the commercial operations that serve the human resources departments of many workplaces (Wijngaards et al. 2021). The resulting information is used to identify sources of discontentment as well as to assess whether productivity could be boosted by ensuring that its workers experience happiness at work.

At the same time the HPW thesis originated in studies focusing on affective experience, most notably Hersey's 1932 study *Worker's Emotions in Shop and Home: A Study of Individual Workers from the Psychological and Physiological Standpoint*. Studies in workplace 'morale' from the following decade also focused on affective experience, with the shift in emphasis from affective experience to cognitive evaluation occurring in the 1950s, as part of the wider 'cognitive revolution' in psychology (Miller 2003).

In this article, we report the results of the increased number of studies exploring the relationship between happiness and productivity at work – a shift that is part of the turn to 'happiness research' that has gained in popularity since the 2000s (Veenhoven 2017) and that takes in both cognitive evaluations and affective experiences. Whereas most previous literature on workers' happiness and productivity has predominantly focused on the cognitive evaluation of well-being at work, the happiness literature focuses on *context-free measures of wellbeing* such as life satisfaction, contentment, and hedonic level of affect. Accordingly, the happiness literature differs from the job satisfaction in that it focuses on the state of subjective well-being in the work setting, where the source of well-being at work can be unrelated to work. As noted by Wijngaards et al. (2021), workers could, for instance, be worried about one of their family members or reliving a fun holiday while being at work. In this area of research, also interest in affective experience is burgeoning, following also the recent revival of emotions and hedonic level of affect in behavioral economics (Loewenstein 2000) and positive psychology (Fredrickson 2004).

1.2 Reasons for focusing on life satisfaction instead of job satisfaction

An important reason to question the continuing focus on job satisfaction is that its impacts on workplace productivity tend to be not only variable, but also modest (e.g., Argyle 1989; Iaffaldano & Muchinsky 1985; Vroom 1964). This realization prompted Fisher (2003) to consider why so many scholars still believe there to be a strong relationship between job satisfaction, on the one hand, and productivity, on the other hand.

Another reason to question the status quo is that appraisals of job satisfaction seem to be influenced by appraisals of happiness. Some longitudinal studies have demonstrated that this so-called "top-down effect" is significantly stronger than the opposing "bottom-up effect" (Headey et al. 1991; Weziak-Bialowolska et al. 2020). Consequently, the effects of job satisfaction on worker productivity appear to be largely driven by the effects of happiness on worker productivity. In this fashion, it is unsurprising that life satisfaction—an evaluative or overall measure of happiness—has been found to be more strongly associated with productivity than job satisfaction (Jones 2006; Wright et al. 2002; Zelenski et al. 2008).

A third reason to shift attention from job satisfaction to happiness is that affective components have been observed to have a much greater impact on workplace performance (e.g., Cropanzano & Wright 1999, 2001; Zelenski et al. 2008). Similarly, recent studies in positive psychology that focus on job satisfaction and productivity—often cited as supporting the HPW thesis—also highlight the relative importance of the affective component (e.g., Boehm & Lyubomirsky 2008). Therefore, in this study, we consider not only research examining the relationship between life satisfaction and productivity but also studies exploring the connection between hedonic levels of affect and productivity.

1.3 Evidence on the relationship between happiness and productivity

The positive effects of happiness are likely to be driven by the following different but related mechanisms: (1) increased health, (2) increased activity, (3) increased sociability, and (4) increased satisfaction with life-domains. First, happiness fosters physical health, in particular by preventing illness. This appeared in a research synthesis of 30 longitudinal studies by Veenhoven (2008). Healthy people will perform better on many tasks than unhappy people. Second, feeling good works as a 'go-signal' while feeling bad rather inhibits activity. Hence happiness fosters activity, its affective component in particular. To date (August 2024) the World Database of Happiness contains 53 findings on this subject which typically report a positive relationship between happiness and activity. Active people will perform better on a lot of tasks than indolent people. For example, happy people are more energetic, can concentrate better and have more energy for additional tasks and dealing with setbacks. Third, happiness facilitates social contacts and strengthens social bonds as demonstrated in a research synthesis of 15 follow-up studies by Agrawal et al. (2024). Hence, happy people are more likely to perform better on tasks that require

interpersonal cooperation. Fourth, satisfaction with life-as-a-whole affects satisfaction with life-domains. The relative strengths of this top-down effects differs across domains. In the case of the work domain, this top-down effect is stronger than the bottom-up effect but in the case of marriage the top-down effect is about as strong as the bottom-up effect (Headey et al 1991). Satisfaction with a life-domain is likely to foster performance in that domain.

These mechanisms are in line with Fredrickson's 'Broaden-and-Build theory' (2004), which holds that positive affect broadens one's action repertoire. Feeling good makes people more curious and open to innovation, new social contacts, receptive for feedback, training, and so on. In contrast, people who feel less well often have tunnel vision, focusing strongly on solving the specific problem causing the negative feeling. As a result, happy people build more sustainable resources than unhappy people, such as more knowledge and skills, a better career, a stronger social network, and better health, which all contribute to greater productivity at work.

1.4 Research questions

In this paper, we explore how happiness works out on productivity in the domain of work, seeking answers to the following questions:

1. Is happiness positively associated with worker productivity, if so, how strong is this relationship?
2. If happiness is associated with worker productivity, do the strengths of the associations differ across sectors and occupations?
3. If happiness is associated with productivity at work, is there a difference in the relative importance of its affective component (how well one feels most of the time) and the evaluative component (fulfillment of personal goals)?
4. To what extent are the above correlations driven by a causal effect of happiness (top-down) on productivity rather than by an effect of productivity on happiness (bottom-up).

1.5 Approach

We considered the available quantitative research findings on the relationship between the happiness of employees and their productivity in the workplace, using the World Database of Happiness. We searched this 'findings archive' (Veenhoven 2020; Veenhoven et al. 2022) for studies on the topic, then examined the results in terms of their applicability to the questions outlined above. We sorted these findings in terms of type of study: (1) cross-sectional research in which happiness and productivity of individuals is measured at one point in time, (2) longitudinal research in which the happiness and productivity of the same individuals are measured repeatedly, and (3) experimental research in which happiness is manipulated for a group of individuals and subsequently effects on productivity are researched. We present our results in separate tables relating to these three types of findings.

While the findings-archive is a type of meta-analysis, it differs from typical meta-analytic studies in several important ways (Veenhoven et al. 2022). One distinction lies in its conceptual rigor. Unlike many meta-analyses, which often rely on the variable names provided in studies without critically examining their content—resulting in the comparison of "apples and oranges"—this synthesis prioritizes conceptual clarity. Another difference is its approach to accessibility and standardization. The research synthesis following from the findings archive provides direct online access to the complete details of the research findings, presented in a standardized format and terminology. In contrast, traditional meta-analyses generally only include references to the original research reports from which the data were extracted. Finally, most traditional meta-analyses aim to summarize research findings in numerical terms, such as by calculating an average effect size. However, quantification is often neither feasible because of the heterogeneity of studies on happiness and productivity nor necessary for addressing the research questions in this case. Instead, by presenting individual findings in tabular formats, this synthesis offers a more detailed understanding of both general trends and specific nuances than a purely numerical summary could achieve. Recent studies using the findings archive technique in the field of happiness studies include the work of Jantsch and Veenhoven (2019) on personal wealth and happiness, Veenhoven et al. (2021) on consumption and happiness, and Sharma et al. (2024) on social relationships and happiness.

While findings archives prepare for various types of research synthesis, including meta-analysis, meta-analysis programs can incorporate some functions of a findings archive. Their spreadsheet-based format allows for detailed information about included studies. However, despite the theoretical possibility, such applications have yet to be widely observed in practice.

1.6 Structure

The remainder of this paper is organized as follows. We describe the key concepts and corresponding measures in Sect. 2. In Sect. 3, we explain how we used the World Database of Happiness for our research synthesis, describing its methodology for gathering and describing research findings. We then present our results and propose answers to our research questions in Sect. 4. We proceed to discuss our findings in Sect. 5 and provide concluding remarks in Sect. 6.

2 Concepts and measures

2.1 Happiness

In the broadest sense, the term ‘happiness’ refers to ‘a good life’ (Veenhoven 2000). In this paper, however, we use the term in the narrower sense of ‘subjective well-being,’ following the definition proposed by Veenhoven (1984), which forms the basis of the World Database of Happiness that we draw upon for this research synthesis.

2.1.1 Definition and components of happiness

Veenhoven (1984, 2000) defined happiness as *'the degree to which an individual judges the overall quality of his/her own life-as-a-whole favorably*'. In short, then, how much one likes the life one lives. This is also known as subjective well-being or life-satisfaction. Within this concept, Veenhoven distinguishes a cognitive component, called 'Contentment' and an affective component referred to as 'Hedonic level of Affect'.

Contentment refers to the extent to which we perceive ourselves as achieving what we desire in life. This concept assumes that an individual has developed conscious desires, formed ideas about how to fulfill them, and possesses the capacity to evaluate whether their life aligns with these aspirations. The hedonic level of affect refers to the extent to which positive emotional experiences outweigh negative ones, commonly known as the 'affect balance.' This measure can be evaluated over varying timeframes, such as an hour, a week, a year, or even a lifetime. In this paper, we focus on the 'enduring' hedonic level of affect, which examines averages over longer periods, such as several months or years.

Although these two components are typically related, they do not always align. For example, we might feel good most of the time while still being far from achieving what we want in life, as is often the case for unemployed individuals (Knabe et al. 2010). Conversely, even after achieving our goals, we might still feel miserable, as has been reported by some famous movie stars. Research suggests that these two components affect an individual's overall happiness (life satisfaction) differently. Notably, overall happiness seems to depend primarily on how well we feel most of the time (Kainulainen et al. 2018), although more research is needed to verify this claim.

2.1.2 Measurement of happiness

Along these lines, it is possible to distinguish between measures of the cognitive component of happiness and measures of the affective component. The former capture perceived differences between what one wants from life and what life brought so far. The most well-known contentment measure is the Cantril ladder (Cantril 1965) used in the annual World Happiness Report. Another measure is the *contentment with life scale (*Lavallee et al. 2007*)*, in which interviewees have to respond to four statements, including **'***I am very content with my life'* and '*When I examine my life as a whole, I feel I am not meeting my aspirations'*. Scales that measure the hedonic level of affect typically ask respondents the extent to which they experienced positive and negative affects over a specified time frame. Positive affective states that are typically included in such scales are 'happy', 'calm', and 'enjoyment', while examples of negative affective states are 'sadness', 'worried', and 'anger'. Apart from these measures of components of happiness, there are measures of

overall happiness.[1] Examples include '*Taking everything together, how happy would you say you are these days?'* and '*How satisfied are you with your life in general?'*.

Please note that not all the questions used to gauge an individual's happiness align with the above definition of happiness. One example is the question of whether you are happier than your peers of the same age—an item on the widely used Subjective Happiness Scale (SHS) by Lyubomirsky & Lepper (1999). The main disadvantage of such a question is that you can feel happier than your peers yet still be dissatisfied with your life because you are all in a miserable situation. Additionally, we generally do not know just how happy other people truly are.

2.2 Work performance and productivity

Performance at work generally constitutes the successful execution of tasks and the outputs that an employee delivers from the inputs. At the aggregate level, it is the performance of an organization or nation. A main aspect of performance is *productivity*, which can be measured at the individual and aggregate level and is the focus of this research synthesis.

2.2.1 Measures of productivity at work

In economics, productivity is typically defined as the amount of output can be produced with a given set of inputs and estimated by dividing the amount and quality of goods and services by the amount of resources invested in producing them (Prokopenko 1987). Productivity involves not only the quantity of the outputs, but also their quality.

Objective indicators to measure productivity are typically production counts. These includes objective quantitative production records, such as the number of sales, number of academic publications, or success in sports competitions. These records can be related to a specific task or to output in general. In addition, there are macro-economic productivity estimates such as average labor productivity and total factor productivity in a nation.

In addition to objective indicators, there are also subjective ratings of productivity at work. Supervisor ratings of work productivity are typically based on a question such as, "Overall, how would you rate this employee's performance over the past year?" Alongside such ratings of overall productivity, there are also assessments of specific aspects of an employee's performance, such as their communication with colleagues. Supervisor ratings often form part of periodic evaluations. Besides supervisor ratings, there are also self-ratings of productivity at work. These self-evaluations address both overall productivity and specific activities, such as the various efforts an individual has made to help their organization succeed.

[1] Commonly used overall happiness measures are global self-report measures of happiness or life satisfaction. Although life satisfaction taps more (less) into the cognitive (affective) component, it is closely related to happiness, both conceptually and empirically. Conversely, it can be argued that the global self-report measures of happiness taps more into the affective experience.

3 Method of this research synthesis

We considered the available research findings about the relations between happiness and productivity that have been gathered in the World Database of Happiness. Below, we explain not only how we obtained findings from this findings archive, but also how this source facilitated the presentation of these findings.

3.1 World database of happiness

The World Database of Happiness is an online 'findings archive', whose structure is presented in Fig. 1. The archive holds electronic 'finding pages', which describe research findings in a standard format, using a standard terminology. An example of such a finding page is given in Fig. 2. Each page has a unique internet address, allowing the pages to be referenced in review papers, such as this one. The goal of the archive is to facilitate research synthesis. For an explanation of this technique, see Veenhoven et al. (2022).

As of August 2024, the archive consists of approximately 48,000 finding pages. These pages can be sorted in various ways, such as by subject, research method, or

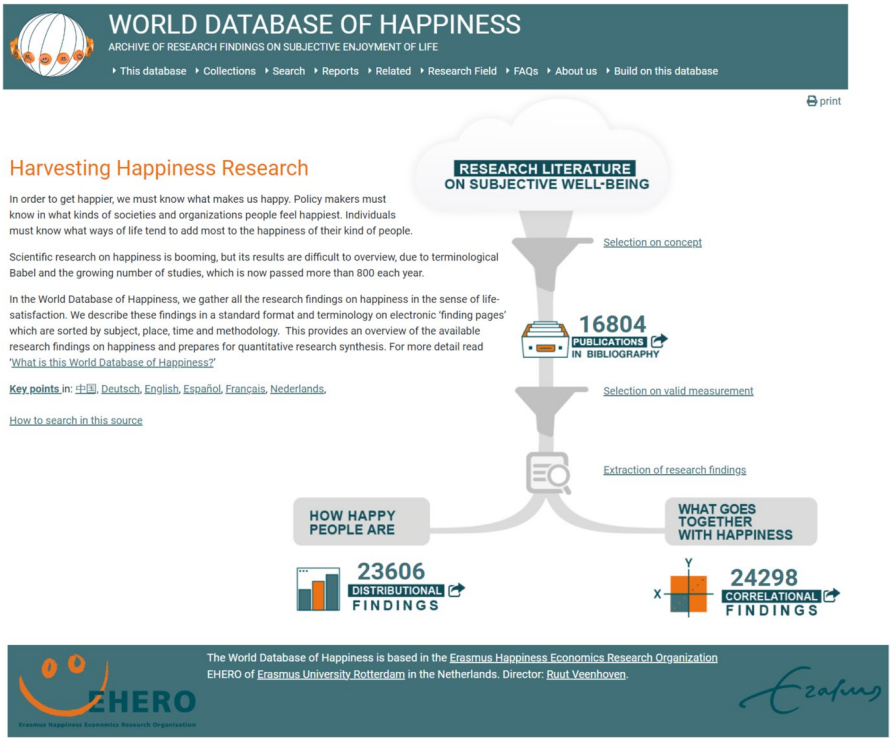

Fig. 1 Start page of the World Database of Happiness

Fig. 2 Example of a finding page in the World Database of Happiness

the characteristics of the people studied. In this article, we used a selection of findings on performance at work, focusing on productivity.

3.2 Gathering research findings and selection of studies

Scientific publications on happiness have been gathered on a continuous basis so that they can be considered for inclusion in the World Database of Happiness – a process that is described in detail here. Of the 16,800 publications that have been included in the database to date, we selected those reporting empirical studies in which the relation between happiness and productivity was assessed. We completed that standard search alongside an additional search that focused on the relation between happiness and productivity. To the best of our knowledge, there are no other databases that specifically gather findings on happiness.

As previously mentioned, the use of the World Database of Happiness implies that only findings aligning with the definition of happiness provided above will be presented. This means that not all publications on worker well-being and productivity are included in this selection. For example, the otherwise interesting study by

Hanaysha (2016), in which work engagement is measured and not the worker's happiness in general, has been omitted from the analysis. Likewise, the study by Oswald et al. (2015) focuses on momentary mood and productivity and not the more enduring happiness is not included in the research synthesis for the same reason. However, in our opinion rigorous selection on a clear concept, in our case a demarcated definition of happiness, is required for a good research synthesis.

Along similar lines, papers that use non-validated measures of happiness are not included in the research synthesis. The World Database of Happiness, on which we draw, makes use only of measures of happiness that have passed a check for face-validity (explained here). In this respect, our research synthesis differs from the recent meta-analysis by Moscoso and Salgado (2022), which includes findings that have been obtained with measures of happiness that did not pass the test for fit with the concept of happiness as given above in Sect. 2.1.

Finally, the findings archive focuses on reporting the results of quantitative empirical investigations. This means that qualitative studies, theoretical work, or literature reviews are not included in the finding archive and omitted from the research synthesis.

3.3 Studies

To date (August 2024), the World Database of Happiness includes 33 empirical studies on the relationship between happiness and productivity. Together, these studies yielded 197 correlational findings.

These 197 findings were observed in 27 different countries and regions. The people that were investigated include the general populations of countries, as well as particular groups, such as students, patients, and employees working in specific occupations. With regard to the occupational scope, 26% of the findings concern social services professionals, 15% concern directors and managers, and 9% concern academics. The remainder are made up of workers on shop floors, salespeople, telephone operators, athletes, pilots, nurses, and other employees whose occupations were not reported. Of the various kinds of employees investigated, 35% were working in the public sector, while 15% were working in the private sector.

A total of 68% of the studies are purely cross-sectional, 18% are purely longitudinal, and 15% contain both cross-sectional and longitudinal findings. None of the studies adopted an experimental approach. A total of 47% of the studies generated pure zero-order correlations, 15% generated pure partial correlations, and 38% generated zero-order as well as partial correlations.

We summarize all studies that have been incorporated into this research synthesis in Table 1.

3.4 Format of this research synthesis

We took advantage of two recent innovations. The first is the availability of an online findings archive (the World Database of Happiness), which presents descriptions of research findings in a standard format, using a standard terminology, on

Table 1 32 studies included in this synthesis of research on happiness and productivity at work

People investigated	Place, Time, Number of observations	Productivity measure	Happiness measure	Source
General public				
16 + aged general public	United Kingdom, 1991–2009 N = 171,690	Production counts	Overall happiness	Geale (2011)
18 + aged general public	Urban areas of Israel, 1973 N = 1830	Self-rating	Overall happiness Affect balance	Levy and Guttman (1975)
21–60 aged general public	Urban areas in the USA, 1963-1964 N = 2787	Self-rating	Affect balance	Bradburn (1969)
18–65 aged general public	20 European countries, 2004–2010 N = 30,000	Change in productivity in country	Overall happiness	DiMaria et al. (2020)
18 + aged general public	34 African nations 2006–2020 N = 350,000	Change in agrarian productivity	Overall happiness	Khaled & Ben Afia (2024)
Special groups				
14 + aged patients and students	Hongkong, China, 1995 N = 236	Self-rating	Mixed measure	Lam et al. (1998)
Evening school students	California, USA; 2006 N = 87	Supervisor rating	Mixed measure	Jones (2006)
Occupational groups				
Scholars	Germany, 2010 N = 49	Production counts	Mixed measure, Affect balance	Dilger et al. (2015)
Academics	Turkey, 2013 N = 339	Self-rating	Contentment	Caz & Tanyeri (2018)
Pilots	Europe, 2016 N = 1147	Self-rating	Overall happiness	Demerouti et al. (2019)
Private pathology laboratory personnel	USA, 1990 N = 198	Supervisor rating	Affect balance	Cropanzano & James (1993)
Sales workers	UK, 2017 N = 12,549	Production counts,	Mixed measure	Bellet et al. (2019)
Workers	Germany, 2015–2017 N = 439	Self-rating	Mixed measure	Frone et al. (2018)
Private sector employees	USA, 1990 N = 270	Supervisor rating	Affect balance	Moorman (1993)
Employees at a private call center	USA, 2017 N = 67	Production counts	Affect balance	Miner & Glomb (2010)

Table 1 (continued)

People investigated	Place, Time, Number of observations	Productivity measure	Happiness measure	Source
Managers	Spain, 2018 N = 245	Supervisor rating	Affect balance	Lado et al. (2021)
Managers	USA, 2004 N = 109	Supervisor rating	Affect balance	Wright et al. (2007)
Public sector managers	USA, 1997–1998 N = 59	Supervisor rating	Affect balance	Wright et al. (2002)
Directors from private sector and the Canadian federal government	Canada, 2005 N = 715	Self-rating	Affect balance	Zelenski et al. (2008)
Public sector supervisory personnel	USA, 1999 N = 45	Supervisor rating	Affect balance	Wright et al. (2004)
Social services personnel	USA, 1994 N = 78	Supervisor rating	Affect balance	Wright & Staw (1999)
Social welfare counselors	USA, 1998 N = 48	Supervisor rating	Affect balance	Wright et al. (2004)
Social welfare department employees	USA, 1994–1998 N = 81	Supervisor rating	Affect balance	Wright & Staw (1999)
Social welfare professionals	USA, 1992–1997 N = 60	Supervisor rating	Affect balance	Cropanzano & Wright (1999)
Social welfare workers	USA, 1995 N = 52	Supervisor rating	Affect balance	Wright & Cropanzano (1998)
Human services workers	USA, 1997 N = 47	Supervisor rating	Affect balance	Wright & Cropanzano (2000)
Human services personnel	USA, 1988–1989 N = 33	Supervisor rating	Affect balance	Wright et al. (1993)
Juvenile probation officers	USA, 1997 N = 37	Supervisor rating	Affect balance	Wright & Cropanzano (2000)
Criminal justice personnel	USA, 1996–1997 N = 76	Supervisor rating	Affect balance	Wright & Bonett (1997)
Female nurses	USA, 1990 N = 97	Supervisor rating Self-rating	Affect balance	Cropanzano & James (1993)
Shop-floor workers	Australia, south-eastern metropolitan areas, 1977 N = 1486	Self-rating of work performance	Overall happiness	Hedley (1981)
World Cup soccer players	Not reported, 1970–2014 N = 304	Production counts	Affect balance	Hopfensitz and Mantilla (2019)

separate finding pages with unique internet addresses (Veenhoven et al. 2022). The second is the change in academic publishing that has occurred since the turn of the millennium, with research papers moving from printed paper copy to electronic text that can be read on screen, allowing links to be inserted in review papers like this one. This enables us to present research findings with a correlation coefficient or a plus or minus sign, while making the technical details available by means of links to the research report or to standardized summaries of separate findings in an online findings archive. In this way, a large number of findings can be presented in tables that are easy to gauge.

3.4.1 Presentation of the findings in tables

The structure of the tables in which we summarize the research findings is provided in Table 2. All subsequent tables in this article follow the same format.

3.4.2 Research design

Horizontally, we distinguish between different types of correlations, including cross-sectional correlations, longitudinal correlations, and correlations based on experimental research. Vertically, we distinguish between different levels of analysis the micro-level or individual level at the top of the table, and the macro-level or national level, at the bottom.

In all cases, the observed degree of association can be expressed by means of a zero-order correlation, such as the often-used Pearson correlation coefficient (r). Alongside such results from bivariate analysis, are a large number of results from multivariate analysis, in which the various effects of the possible intervening variables are controlled. These findings are expressed with statistics such as the partial correlation coefficient (rpc), the standardized regression coefficient (Beta), or the unstandardized regression coefficient (b). Some of the findings are based on Instrumental Variable (IV) analysis.

3.4.3 Notation

We reported the *direction* of the observed correlations by means of + and – signs, and we used 0 to denote the absence of a correlation. The strengths of the relationships are expressed by means of correlation coefficients ranging between –1 and + 1, such as the above-mentioned r, rpc, and Beta. We do not report unstandardized regression coefficients (b) for strength size, because these differ in range and therefore cannot be compared in terms of their relative strength. The statistical significance ($p < 0.05$) is indicated by a sign or number **in bold**.

Further methodological differences are indicated in the tables as follows.

- We use '\' to present correlations of different indicators of the same variable in one study.

Table 2 26 Research findings on correlation between happiness and objective indicators of productivity at work

Aspect of productivity at work	Research method								Happiness measure
	Cross-sectional			Longitudinal			Experimental		
	Zero-order	Partial	IV	Zero-order	Partial	*IV*	Zero-order	Partial	
Micro level studies									
Production counts									
Sales		+\+ +	+						Mixed measure
Call time (in call center)	−		−						Hedonic level
			−						Mixed measure
Number of academic publications		+\+\+							Hedonic level
		+\+\+							Mixed measure
Success in sports competition		+\+\−\+							Hedonic level
Test performance	+	0							Overall happiness
Productivity measured with wage		+/0	−/−/−						Overall happiness
Macro level studies									
Change in productivity in nation				+/+	+				Overall happiness

Signs explained on Appendix. Use control + click to see detail on an online finding page

- We use '/' to present correlations obtained with different sets of control variables in one study.
- We use 'l' to present correlations obtained from different lags of time in one study.
- We present a sign or number in grey when happiness was measured *after* measuring productivity, in order to investigate the effect of earlier productivity on later happiness.

3.4.4 Links

A sign or a coefficient represents a correlational finding. As noted above, all the signs and numbers in the tables are linked to the corresponding finding pages in the World Database of Happiness. By clicking on the hyperlink, the reader gets access to the online finding page that presents details about particular research findings and often a link to the research report.

3.4.5 Empty cells

The reader will be surprised to see many empty cells in the tables and even an empty column for experimental studies. This is to show blanks in current knowledge. This review serves not only to summarize what we know now, but also to identify what we do not know yet. The advantages and disadvantages of this approach to research reviewing, as well as its differences from traditional research reviewing and meta-analysis, are discussed in Veenhoven (2021).

3.4.6 Organization of the findings across tables

The observed correlations between happiness and productivity at work are presented in the following tables: in Tables 2 and 3, we show the correlations with *objective* indicators of productivity, while in Tables 4 and 5, we display correlations with

Table 3 Observed effect strengths of zero-order correlations between happiness and *objective* indicators of productivity at work

Aspect of productivity	Research method			Happiness measure
	Cross-sectional	Longitudinal	Experimental	
Micro level studies				
Production *counts*				
Sales				
Call time (at Call Center)	−0.27			Hedonic level
Number of academic publications				
Success in sports competition				
Productivity measured with wage				
Test performance	+0.01			Overall happiness
Macro level studies				
Change in productivity in nations		0 to 4%		Overall happiness

Table 4 148 Research findings on correlation between happiness and *subjective* ratings of productivity at work

Aspect of productivity	Observed correlation with happiness						Happiness measure
	Research method						
	Cross-sectional		Longitudinal		Experimental		
	Zero-order	Partial	Zero-order	Partial	Zero-order	Partial	
Micro level studies							
Supervisor rating of work performance							
General work performance	+ 0	+/+ + + + + + + + + ?	± + + |+|+ |+ |+|± + |+|+|+|+|+|+|+|+|+ + | + |+|+|+|± + | + |+|+|+|+|+|+|+|+|+	+/+ + + + +			Hedonic level
	+ +	+ +					Mixed measure
Attentiveness	+		+ + |+|+ + |+|+ + |+|+				Hedonic level
Engagement in work	+						Hedonic level
	+	+					Mixed measure
Goal emphasis	+		+ + |+|+ + |+|+ + |+|+ + |+|+				Hedonic level
Organization of work	+		+ + |+|+ + |+|+ + |+|+ + |+|+				Hedonic level
Social functioning at work	+ 0 0		+ + |+|+ + |+|+ + |+|+ + |+|+				Hedonic level
Self-rating of work performance							
General work performance	+						Overall happiness
	+ + +		+	+			Hedonic level
	+ −						Contentment
	+ +						Mixed measure
Macro level studies							
Engagement in work	+ + + + −						Overall happiness
	+	+ +					Hedonic level
	+ +						Mixed measure
Social functioning at work	+						Hedonic level

Signs explained on Appendix. Use control + click to see detail on an online finding page

Table 5 Observed effect strengths of zero-order correlations between happiness and subjective ratings of work performance

Aspect of productivity	Observed correlation with happiness			Happiness measure
	Research method			
	Cross-sectional	Longitudinal	Experimental	
Micro level studies				
Supervisor ratings of work performance				
General productivity	**+0.26 +0.25 +0.43 +0.32 +0.37 +0.37 +0.40 +0.33 + 0.32 +0.29 +0.34 +0.43 +0.32 +0.34** 0 *Average. = +0.30*	**+0.27 +0.45** **+0.48|+0.40|+0.48** **+0.46|+0.48|**+0.18 **+0.36|+0.37|+0.32|+0.37|+0.33|+0.2 9|**+0.25|+0.38 **+0.36|**+0.27|+0.18|+0.21|+0.17|+0. 26 **+0.45|+0.39|+0.47|+0.35|+0.48|+0.3 8|+0.40|+0.51|+0.42|+0.52** *Average = +0.45*		Hedonic level
	+0.27 +0.28 *Average = +.28*			Mixed measure
Attentiveness	+0.19	**+0.30 +0.35|+0.30|+0.28** +0.09|+0.03|+0.10 +0.19|+0.23|+0.21 *Average = +0.21*		Hedonic level
Engagement in work	**+0.24**			Mixed measure
Goal emphasis	**+0.32**	**+0.46 +0.38|+0.37|+0.40** **+0.41|+0.28|+0.47** **+0.38|+0.33|**+0.22 **+0.31|**+0.21|+0.17 *Average. = +0.34*		Hedonic level

Table 5 (continued)

Aspect of productivity	Observed correlation with happiness			Happiness measure
	Research method			
	Cross-sectional	Longitudinal	Experimental	
Micro level studies				
Supervisor ratings of work performance				
Organization of work	**+0.31**	**+0.44**+**0.45**|+**0.35**|+0.44 +**0.24**|+**0.42**|+0.36 +**0.47**|+**0.34**|+0.16 +**0.38**|+0.17|+0.10 *Average.* = +*0.33*	Hedonic level
Social functioning at work	**+0.32** 0 0 *Average* = +*0.16*	**+0.41**+**0.52**|+**0.35**|+**0.47** +**0.46**|+**0.32**|+0.17 +**0.42**|+**0.36**|+0.24 +**0.44**|+0.23|+0.18 *Average.* = +*0.35*	Hedonic level
Self-rating of productivity at work				
Macro level studies				
General productivity	+0.29			Overall happiness
	+0.31			Hedonic level
	+0.06 −0.01 *Average* = +*.03*			Contentment
	+0.01 +0.16 *Average.* = +*0.08*			Mixed measure
Engagement in work	**+0.06** **+0.47** +0.05 +0.05 −0.09 *Average* = +*0.12*			Overall happiness
	+0.20 **+0.47** *Average* = +*0.34*			Mixed measure
Social functioning at work	**+0.13**			

Table 6 Strengths of zero-order correlations between happiness and later subjective ratings of productivity at work *Split by length of time lag*

Aspect of later productivity	Correlation with earlier happiness		Happiness measure
	Correlation with later LEVEL of productivity	Correlation with later CHANGE in productivity	
Micro level studies			
Supervisor ratings of productivity			
General productivity	1-year later: r = **+.40** 2-years later: r = **+.48** Same time: r = **+.33** 1-year later: r = **+.35** 2-years later: r = **+.40** 3-years later: r = **+.45** 4- years later: r = **+.39** 4,5 years later: r = **+.47** Same time: r = **+.25** 1-year later: r = **+.48**	2-years later: Beta = **+.49**	Hedonic level
Attentiveness	1,5 years later: r = **+.35** 2-years later: r = **+.30** 3-years later r = **+.28**		Hedonic level
Engagement in work			
Goal emphasis	1,5 years later: r = **+.40** 2-years later: r = **+.37** 3-years later r = **+.38**		Hedonic level
Organization of work	1,5 years later: r = **+.40** 2-years later: r = **+.37** 3-years later r = **+.38**		Hedonic level
Social functioning at work	1,5 years later: r = **+.47** 2-years later: r = **+.35** 3-years later r = **+.52**		Hedonic level
Macro level studies			
Self-rating of productivity at work			
General productivity			
Engagement in work			
Social functioning at work			

Table 7 30 Research findings on the correlation between happiness and *objective* indicators of productivity at work

Productivity at work	Observed relation with happiness						Happiness measure
	Research method						
	Cross-sectional		Longitudinal		Experimental		
	Zero-order	Partial	Zero-order	Partial	Zero-order	Partial	
Split by occupation							
Salesmen	–	–					Hedonic level
		+\+ + +/+ +\–					Mixed measure
Scholars		+\+\+					Hedonic level
		+\+\+					Mixed measure
Athletes		+\+\–\+					Hedonic level
Split by sector							
Public sector							
Private sector	–	–					Hedonic level
		+\+ +/+ + +\– +					Mixed measure

Signs explained on Appendix. Use control + click to see detail on an online finding page

subjective ratings of productivity. Next, in Tables 6, 7, 8, 9, 10 we explore how these relationships between happiness and productivity at work differ vary depending on temporal, occupational and sectoral scope.

Table 8 Observed effect strengths of zero-order correlations between happiness and objective indicators of productivity at work. *Split by occupation and sector*

	Observed relation with happiness			Happiness measure
	Research method			
	Cross-sectional	Longitudinal	Experimental	
Split ***by occupation***				
Salesmen	–0.27			Hedonic level
Scholars				
Athletes				
Split by sector				
Public sector				
Private sector	–0.27			Hedonic level

Table 9 257 Research findings on the correlation between happiness and subjective ratings of productivity at work. made by supervisors and self

<table>
<tr><td rowspan="4">Productivity at work</td><td colspan="6">Observed relation with happiness</td><td rowspan="4">Happiness measure</td></tr>
<tr><td colspan="6">Research method</td></tr>
<tr><td colspan="2">Cross-sectional</td><td colspan="2">Longitudinal</td><td colspan="2">Experimental</td></tr>
<tr><td>Zero-order</td><td>Partial</td><td>Zero-order</td><td>Partial</td><td>Zero-order</td><td>Partial</td></tr>
<tr><td>Split by occupation</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Social services workers/ Social welfare workers/</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Human services personnel/ Criminal justice personnel/ Juvenile probation officers</td><td>+ + + + + +
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|+ +|+|+ +|+|+</td><td>+/+ + + +</td><td></td><td></td><td>Hedonic level</td></tr>
<tr><td>Shop–floor workers</td><td>+ −</td><td></td><td></td><td></td><td></td><td></td><td>Overall happiness</td></tr>
<tr><td>Managers/Directors</td><td>+ + + +</td><td>+/+ + +</td><td>+ +</td><td>+ +</td><td></td><td></td><td>Hedonic level</td></tr>
<tr><td>Laboratory personnel</td><td>+</td><td>+ ?</td><td></td><td></td><td></td><td></td><td>Hedonic level</td></tr>
<tr><td>Academics</td><td>− +</td><td></td><td></td><td></td><td></td><td></td><td>Contentment</td></tr>
<tr><td>Pilots</td><td>+ + + + +</td><td>0</td><td></td><td></td><td></td><td></td><td>Overall happiness</td></tr>
<tr><td>Nurses</td><td>+ +</td><td>+ + +</td><td></td><td></td><td></td><td></td><td>Hedonic level</td></tr>
<tr><td>Split by sector</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>–</td><td>+ + + + + +
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+ + + + 0 +</td><td>+ + + + + + + +</td><td>+ + + + + + +|+|+ +|+|+ +|+|+
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|+|+ +|+|+</td><td>+/+ + + + +</td><td></td><td></td><td>Hedonic level</td></tr>
<tr><td></td><td>− +</td><td></td><td></td><td></td><td></td><td></td><td>Contentment</td></tr>
<tr><td>Private sector</td><td>+ + + 0 0</td><td>+/+ + ?</td><td></td><td></td><td></td><td></td><td>Hedonic level</td></tr>
</table>

Signs explained on Appendix. Use control + click to see detail on an online finding page

Table 10 Strengths of zero-order correlations between happiness and subjective ratings of productivity at work

Productivity at work	Observed correlation with happiness			Happiness measure
	Research method			
	Cross-sectional	Longitudinal	Experimental	
Split by occupation				
Managers/Directors	**+0.26 +0.37 +0.37 +0.43** *Average = +0.36*	**+0.45**		Hedonic level
Social services workers/ Social welfare workers/ Human services personnel/ Criminal justice personnel/ Juvenile probation officers	**+0.25 +0.32 +0.40 +0.33 +0.32 +0.29 +0.34 +0 .31 +0.32 +0.32 +0.32 +0.34** +0.19 0 *Average = +0.29*	**+0.27 +0.46 +0.41 +0.44 +0.30** **+0.48|+0.40|+0.48** **+0.52|+0.35|+0.47** **+0.35|+0.30|+0.28** **+0.41|+0.28|+0.47** **+0.38|+0.37|+0.40** **+0.45|+0.39|+0.47|+0.35|+0.48|+0.38|+0.40|+0.51|+0.42|+ 0.52** **+0.36|+0.37|+0.32|+0.37|+0.33|+0.29**|+0.25|+0.38 **+0.36**|+0.27|+0.18|+0.21|+0.17|+0.26 **+0.38|+0.33**|+0.22 **+0.45|+0.35**|+0.44 **+0.46|+0.32**|+0.17 **+0.24|+0.42**|+0.36 **+0.47|+0.34**|+0.16 **+0.42|+0.36**|+0.24 **+0.46|+0.48**|+0.18 **+0.44**|+0.23|+0.18 **+0.31**|+0.21|+0.17 **+0.38**|+0.17|+0.10 +0.09|+0.03|+0.10 +0.19|+0.23|+0.21 *Average = +0.33*		Hedonic level
Pilots	**+0.13 +0.06 +0.47** +0.01 +0.05 *Average = +0.14*			Overall happiness
Academics	+0.06 −0.01 *Average = +.03*			Contentment
Shop–floor workers	+0.05 −0.09 *Average = -.02*			Overall happiness

Table 10 (continued)

Productivity at work	Observed correlation with happiness			Happiness measure
	Research method			
	Cross-sectional	Longitudinal	Experimental	
Split by sector				
Public sector	**+0.25** **+0.32** **+0.40** **+0.33** **+0.32** **+0.29** **+0.34** **+0.31** **+0.32** **+0.32** **+0.32** **+0.34** **+0.37** **+0.37** +0.19 0 +0.06 -0.01 *Average* = *+0.27*	**+0.27** **+0.46** **+0.41** **+0.44** **+0.30** **+0.45** **+0.48**|**+0.40**|**+0.48** **+0.52**|**+0.35**|**+0.47** **+0.35**|**+0.30**|**+0.28** **+0.41**|**+0.28**|**+0.47** **+0.38**|**+0.37**|**+0.40** **+0.45**|**+0.39**|**+0.47**|**+0.35**|**+0.48**|**+0.38**|**+0.40**| **+0.51**|**+0.42**|**+0.52** **+0.36**|**+0.37**|**+0.32**|**+0.37**|**+0.33**|**+0.29**|+0.25|+0.38 **+0.36**|+0.27|+0.18|+0.21|+0.17|+0.26 **+0.38**|**+0.33**|+0.22 **+0.45**|**+0.35**|+0.44 **+0.46**|**+0.32**|+0.17 **+0.24**|**+0.42**|+0.36 **+0.47**|**+0.34**|+0.16 **+0.42**|**+0.36**|+0.24 **+0.46**|**+0.48**|+0.18 **+0.44**|+0.23|+0.18 **+0.31**|+0.21|+0.17 **+0.38**|+0.17|+0.10 +0.09|+0.03|+0.10 +0.19|+0.23|+0.21 *Average* = *+0.25*	Hedonic level
Private sector	**+0.43** 0.0 -.27 *Average* = *+0.05*			Hedonic level

In Tables 2, 3, 7 and 9 we present all the findings using + and – signs, which indicate the *direction and significance* of correlation. In Tables 4, 5, 8 and 10 we present the available finding on *size* of the correlations, which are less numerous. In Table 6 we present effect sizes over different time-lags.

4 Results

Having taken the preliminary steps above, we can now proceed to answer the research questions raised in Sect. 1.4.

4.1 Is happiness related to productivity at work?

We first examined the observed relations between happiness and indicators of productivity.

4.1.1 Correlation between happiness and objective indicators of productivity

In Table 2, we present the available results; 24 findings are on differences in productivity between individuals, while 2 findings are on differences in productivity between nations.

At the micro-level, only cross-sectional studies are available. A total of 67% of the signs were positive, of which 69% in bold, implying that productivity at work tends to be significantly associated with happiness.

The correlation between happiness and *sales* appears to be predominantly positive but the correlation with *call time* in a call center appeared to be negative, suggesting that happy telephone operators took more time for customers. With regard to the negative associations, five of the seven were statically significant. Specifically, these negative correlations concerned employees at a private callcenter, profession al soccer players, and members of the British general public, whose productivity was measured by means of the wage they earned. In the study on the British general public, no correlation between the happiness and productivity variables was found.

These positive correlations do not necessarily imply that happiness *causes* greater productivity at work, given that productivity at work can also boost happiness, which we discuss in greater detail in Sect. 5.3. An assessment of causality ultimately requires instrumental variable techniques or experimental studies, which are limited, as visualized by the empty columns in Table 2. The findings based on an IV analysis are indicative of a causal effect.

At the macro level, one finding concerns the relation between changes in happiness and production efficiency in 20 European countries over a number of years. A positive correlation was observed, as shown in Fig. 3. In this case, a causal effect is more likely to be involved, because there is a *correlated change* between the growth in productivity of nations, on the one hand, and a rise in the average person's happiness, on the other. The authors conducted a sophisticated analysis, not only to estimate the positive effects of happiness on productivity, but also to show that life

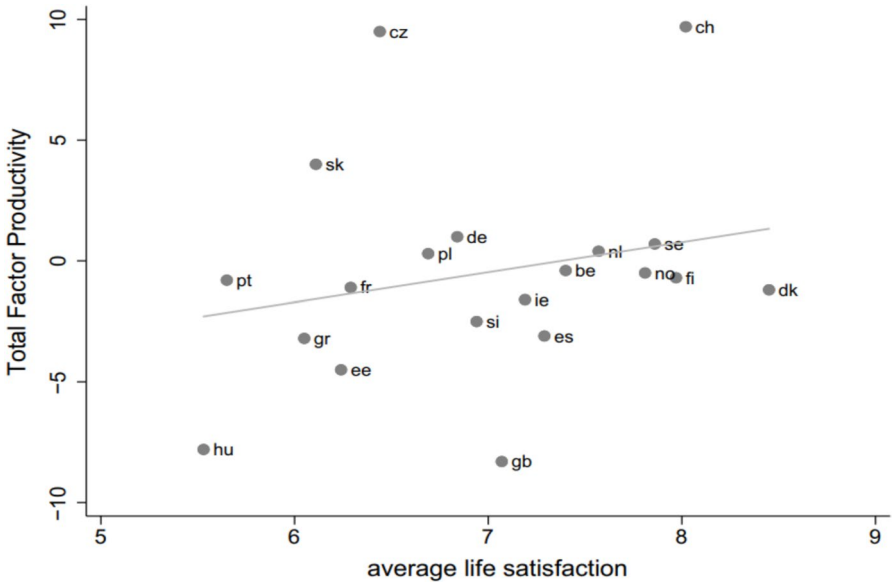

Fig. 3 Correlation between gain in productivity and average happiness in 20 European nations. Source: Di Maria et al. (2020)

satisfaction should considered as an input to production and not as an output to production. Hence, despite the authors do not use traditional IV techniques, this provides some evidence for a causal relationship between happiness and productivity. Likewise, a study on rise of agricultural productivity in 34 African nations found a relation with rise of average happiness over 15 years period.

In sum, happiness goes typically together with productivity at work as measured with objective indicators, both at the micro level of individuals and the macro level of nations. Moreover, earlier happiness predicts later productivity.

4.1.2 Correlation between happiness and subjective indicators of productivity

In Table 3, we present findings on the correlation between happiness and subjective ratings of productivity. In the upper section of Table 3, we report 128 findings on the relation between the happiness of employees and the ratings of their productivity by supervisors. Positive signs prevail, with 96% and 72% of these positive correlations being significant.

A large number of longitudinal findings demonstrate that higher ratings of productivity by supervisors are often preceded by greater happiness. In addition to better overall productivity ratings, happiness predicts higher evaluations of an employee's attentiveness, goal orientation, facilitation of work, and team-building skills. The happier an employee is initially, the higher their subsequent productivity is rated by their supervisor. These positive over-time correlations not only remained consistent across different time periods but also persisted even when controlling for variables such as age, gender, and years of education. Furthermore, happiness not

only predicted higher productivity ratings but also contributed to increased productivity ratings over time. Moreover, three studies examined the relationship between previous productivity and subsequent happiness, also finding positive correlations.

In the lower section Table 3, we report 20 findings relating to the correlation between happiness and self-ratings of productivity at work. Eighteen of these were positive, with eight being statistically significant. The two negative correlations were not significant. Self-reported engagement at work was significantly correlated with happiness, while self-ratings of general productivity at work were not. Two longitudinal findings were positive, but the significance of these cases was not assessed.

Overall, we can conclude that the majority of correlations between happiness and productivity suggests that happiness is associated with higher subjective ratings of productivity.

4.2 How strong are the correlations?

Effect sizes can be compared only for zero-order correlations, because partial correlations involve different controls and estimation techniques. The available Pearson correlation coefficients are listed in Tables 4, 5, 6, 8, and 10.

4.2.1 Size of correlations in cross-sectional research

In Table 4 we see only two effect sizes for *objective* measures of productivity at work, both of which were substantial. In Table 5, we can see that the cross-sectional correlations between happiness and *supervisor ratings* of general productivity vary from + 0.01 to + 0.43, with an average of + 0.30. The cross-sectional correlations between happiness and an employee's *self-ratings* of general productivity range from –0.01 to + 0.31, with an average of + 0.14. Hence, supervisor ratings seem to be a better predictor of productivity than self-ratings.

4.2.2 Size of correlations in longitudinal research

The longitudinal column in Table 4 shows that the gain in efficiency of national production per unit of growth in life satisfaction ranges from 0 to 4%. In France, Germany, Poland, and Hungary, this impact exceeded 3%, but in Ireland, Sweden, Belgium, and Switzerland, it was less than 1%. As can be derived from Table 5, longitudinal correlations between earlier happiness and later supervisor ratings of general productivity at work range from + 0.18 to + 0.52, with an average of + 0.38. Reversed over-time correlations of the two variables vary from + 0.18 to + 0.27, with an average of + 0.24. The average size of longitudinal correlations between happiness and attentiveness is + 0.21. The size increases to + 0.34 for emphasis on goals, to + 0.33 for the facilitation of work, and to + 0.35 for team-building skills.

Overall, the sizes of the correlations between happiness and productivity are generally positive and modest to considerable, both for correlations in cross-sectional and longitudinal studies.

4.3 Is the relation between happiness and productivity short-lived?

In Table 6, we present the findings that distinguished between time lags of different lengths. Such distinctions have been made only for correlations between earlier happiness and later productivity at work as measured using supervisor ratings. The many empty cells in the table illustrate the blanks in current knowledge on this subject.

We see that the correlation between earlier happiness and later ratings of the employee's productivity at work by supervisors tend to be stronger for longer time lags, most so for rating of general productivity and for social functioning in the job. This increasing correlation can be interpreted as a 'sleeper effect': happiness fostering healthy developments which in interaction cumulatively add to productivity at work. Future research is necessary to verify this explanation. A slight decrease in strength of the correlation was found for *attentiveness* to managers suggestions. Possibly, a reversed effect of happiness on non-conformism plays a role here, which should also be verified in future research. In sum, the correlation between happiness on later productivity at work is not short-lived.

4.4 Does the correlation between happiness and productivity at work differ across occupations and sectors?

In Tables 7, 8, 9 and 10, we present the observed correlations between happiness and productivity at work sorted by occupation and sector. As shown in Tables 7 and 8, strong positive relations between happiness and *objective* productivity at work were observed among athletes, salesmen, and scholars. These findings are based on cross-sectional analyses,

Turning attention to subjective measures of productivity in Tables 9 and 10, we find particularly strong positive over-time correlations between earlier happiness and *subjective* ratings of subsequent productivity among directors, mangers, and social services professionals, such as social welfare workers and criminal justice professionals. Less strong correlations between happiness and subjective ratings of productivity were observed among nurses, pathology laboratory personnel, and pilots.

As such, then, the relations between happiness and productivity tend to be strongest for leaders. Happiness facilitates leadership anyway (Lyubomirsky et al. 2005). Likewise, happy social services professionals are more likely to do well in their job, especially when their productivity is measured using subjective ratings. Happiness fosters empathy (Strayer 1980), which is essential in this work. At the same time, the number of studies is limited and future research has to further establish how the relationship between happiness and productivity varies across occupations and sectors.

At the bottom of Table 10 we see strong correlations among public servants, average same-time correlation is +.27 and average over-time correlation is +.25. Findings on this subject in the private sector are less numerous, with only two same-time correlations that average to +.14.

In sum: The correlation between happiness and productivity at work appears to differ across occupations The effect of happiness on productivity at work appears to be most pronounced among people in leadership positions and among social workers. The effect also seems to be stronger in the public sector than in the private sector.

4.5 Is there a difference in correlation with productivity at work between the affective component and the cognitive component of happiness?

In Sect. 1, we noted that the research on the relation between job satisfaction on productivity at work has generally focused on cognitive evaluations. Then, in Sect. 2.1, we drew a distinction between two separate 'components' of happiness: an affective component (how well we feel most of the time) and a cognitive component (perception of getting from life what you want). This distinction between these separate elements of happiness raises the question as to whether there is a difference in the correlation of those components with productivity at work.

In order to explore possible differences we noted for all findings what measure of happiness had been used. We distinguished between a) measures of overall happiness, b) measures of hedonic level, c) measures of cognitive contentment and d) mixed measures of happiness, that is, measures that combine indicators of the above variants. The happiness measures used is reported in the right-hand column of the tables.

Among the 197 correlations in this research synthesis, 11% were assessed by means of a measure of overall happiness, 74% were based on a measure of hedonic level (typically affect balance scores) while only 1% involved a measure of cognitive contentment. Mixed measures of happiness underly 15% of the correlations; all questions that address both overall happiness and hedonic level of affect, such as questions on how happy one typically feels.

The strengths of correlations can best be compared *within* studies that used multiple measures of happiness. The only study of that kind by Levy and Guttman (1975) found quite similar correlations of self-rating of performance at work with a measure of affect level (r = + . 30) and with a measure of overall happiness (r = +0.28).

Comparison *across* studies reveals that the average correlation with supervisor ratings of productivity is equally strong for affect level (r = +30) compared to overall happiness (r = +28). Yet, the average correlation with self-rating of productivity at work is stronger for measures of hedonic level of affect (r = +0.30 than for mixed measures (r—+0.08). Only one study assessed the relation between self-rating of general productivity at work and the cognitive component of happiness and found no significant association (r = +0.03 in Caz & Tanyeri 2018) and differs as such from

the average correlation observed with measures of hedonic level of affect (+0.31) and measures of overall happiness (+0.29).

Correlations based on mixed measures of happiness were marginally lower than correlations based on measures of hedonic level of affect in the cases of general productivity as measured by supervisor ratings (r-+0.28 vs+0.30). In the case of self-ratings of productivity, the average correlation using mixed measures of happiness was+0.08 and while the correlation with pure hedonic level of affect measures was+0.31. In the case of self-rated engagement in work, the average correlation with mixed measures of happiness was+0.34 while the correlation with overall happiness was only+0.12. The available findings are provided in Table 5 and suggest that the affective component of happiness and overall happiness measures are related to productivity at work; there is currently no evidence for an association between the cognitive component of happiness and productivity.

4.6 Does happiness cause greater productivity at work?

The above-mentioned correlations between happiness and productivity at work can be caused by (1) a third variable, such as health, which drives both happiness and productivity, (2) an effect of productivity on happiness and (3) an effect on happiness on productivity. The Happy Worker Thesis assumes a causal effect of happiness on productivity (3). Two of the studies used IV-methods or tried to account for reverse causality in another way (DiMaria et al. 2020).

Ideally, we need more (quasi-)experimental evidence for proving that effect. Yet, experimental studies on this subject are lacking as, yet, as visualized by the empty cells in Tables 2 and 4. Two experiments by Oswald et al. (2015) showed a causal effect but did not use acceptable measures of happiness. In the first experiment, on students made feel happy were more productive on cognitive tasks than student made feel bad. However, the study used a measure of momentary mood instead of happiness as defined above in Sect. 2.1. The second experiment was a natural experiment: students whose parents had recently divorced were found to perform less well in school than students who had experienced no such negative event. Again, momentary mood was used as an outcome, not happiness.

What other evidence do we have for a causal effect of happiness on productivity at work?

4.6.1 Causal mechanisms

Above in Sect. 1.3 we discussed the causal mechanisms that are likely to be involved in the observed effects of happiness on performance on various tasks. All these mechanisms are likely to apply to productivity at work.

4.6.2 Partial correlations remain positive

Correlations between happiness and productivity at work can de driven by a third factor, such as good health fostering both happiness and productivity, while there is no effect of happiness on productivity. Many of such possible spurious effects were checked in the partial correlations presented in Table 5. Most of the correlations survived such controls as appears in the high average of partial correlations. Still, not all possible spurious effects have been checked for yet.

4.6.3 Predictive power of happiness

Above in Table 6 we have seen that (1) present level of happiness predicted future level of productivity a work and (2) that change in happiness also predicted future change in productivity.

Moreover, the Instrumental Variable analysis by DiMaria et al. (2020) suggests that happiness is an input to productivity and not an output. This is also indicated in the study of Wright & Staw (1999), who found that the association between happiness on future productivity is stronger ($r = =0.46$) than the association between of productivity and future happiness ($r = +0.18$). In sum, a causal effect of happiness on productivity at work is likely to likely to exist, but more studies are needed.

5 Discussion

Our findings reveal that happiness appears to have a considerable positive impact on productivity. This is consistent not only with the broaden-and-build theory of Fredrickson (2004), but also with the views of Wright, Cropanzano, and Bonett (2007), who argue that happiness depends on access to resources that facilitate better job performance. In this context, then, the following questions arise.

5.1 Why would the affective component be more strongly related to productivity?

In Sect. 4.5, we observed that the correlation with productivity at work was stronger for the affective component of happiness than for overall happiness and the cognitive component of happiness. Why is that?

One reason that the affective experience has a stronger psychologically force than cognitive evaluation, known as the 'primacy of affect' (Zajonc 1984). This fits the dominance of affective experience in the appraisal of overall satisfaction with life (Kainulainen et al. 2018).

A related explanation is that the average level of affect is more indicative of wider flourishing. Affect, then, acts as our primary bio-psychological compass, while the

cognitive evaluation that developed later in evolutions constitutes a secondary orientation mechanism (Veenhoven 2009).

One reason specific to the cognitive component is that contentment depends on social comparison (Kamilçelebi and Burger 2024), meaning that it is a much more relative phenomenon than affective experience. Basically, contentment involves imagining that one is better in some way: better off than other workers, for instance, or better off now than previously. Such understandings, however, do not prompt greater investment in work. At the same time, it must be acknowledged that the evidence on the relationship between contentment and productivity is limited and more research is needed to compare the two components.

5.2 Why a stronger effect of happiness than of job satisfaction?

In Sect. 1, we noted that job satisfaction dominated tests of the HPW thesis, also mentioning the evidence that job satisfaction had a smaller effect on productivity than overall happiness.

One possible reason for this difference is that job satisfaction is typically measured by means of questions that prompt a cognitive evaluation (Wijngaards et al. 2021), as opposed to one in terms of affect. In Sect. 4.5, we pointed out that cognitive experience is not as strong as affective experience in terms of influencing work performance. As such, we expect affective measures of job satisfaction – that is, how well employees feel when they are at work – to reveal a greater effect on productivity.

Another possible explanation is that life satisfaction is more constitutive than mere job satisfaction, in terms of having a greater impact on an employee's physical as well as mental health, which, in turn, boosts performance at work. Yet, the literature could benefit from a more direct comparison between domain-specific measures and general measures of worker well-being.

5.3 Reversed causality: how could that work?

Along with the evidence that previous happiness has an effect on subsequent productivity at work, we also found evidence for a bi-directional relationship, i.e., previous productivity predicting subsequent happiness.

At the individual level, one explanation is that feelings of accomplishment—and, consequently, higher self-esteem—that stem from strong productivity at work can lead to increased levels of happiness. Conversely, the opposite is also true: low productivity at work can result in feelings of frustration, diminished morale, and a negative impact on an employee's overall happiness. Additionally, high productivity can foster more social connections and improve relationships with others, further contributing to greater happiness.

At the macro level, a nation's growth in productivity is likely to provide its citizens with increased resources, such as higher incomes, improved public services, and greater job security, all of which can enhance overall happiness.

5.4 Limitations

The studies that we have included in this research synthesis are not without their (methodological) limitations. The strongest effect of happiness we found related to an employee's productivity as rated by their supervisor. Such subjective ratings can, of course, be biased, plus it is also possible that happier people are simply more pleasant to be around, giving rise to higher ratings of their performance. Likewise, self-ratings of performance can similarly be distorted by self-serving bias, social desirability, lack of introspective ability, and so on. These problems have been acknowledged (Staw & Barsade 1993; Wright & Cropanzano 2000; Wright, Cropanzano & Bonett 2007), but they have yet to be solved.

A second limitation relates to the demonstration of causality. Although we provided indications for a causal effect of happiness on productivity in Sect. 4.6, more (quasi-)experimental studies are needed. More experimental evidence will come into reach when happiness interventions in the workplace become more common and observed gains in happiness can be linked to improved productivity at work. Experimental evidence can also be derived from effects of externally induced unhappiness of workers on their productivity, such as the death of a parent (see e.g. Liberini et al. 2017 for a study on voting behavior).

A third limitation is that most studies typically include one measure of happiness measure, while happiness has multiple dimensions. In this regard, future research should focus more on a direct comparison of different happiness measures and their relationship with productivity. Specifically, such studies are needed to compare the relative importance of the affective and cognitive component of happiness.

Although there is evidence that happiness tends to add to productivity, the relationship between happiness and productivity also appears to be heterogeneous. More research is necessary to find out what matters for whom under which circumstances. Such knowledge is required for efficient investment in happiness interventions in organizations and countries.

We did not include the detailed statistical information available on the size of the relationships from the online findings pages, nor did we employ common meta-analytical methods to analyze this data. For instance, we did not present observed correlations in a stem-and-leaf diagram, calculate average effect sizes, or estimate the extent of publication bias. This decision was based on the fact that comparable effect sizes could only be calculated for zero-order correlations, and even then, only for about half of the cases. Since the purpose of this article was to provide a comprehensive overview of all available data, limiting the scope to a small subset of comparable findings was not an option.

Our schematic approach to presenting individual findings offers certain advantages over condensing a large number of results into only a few aggregate metrics, such as an average effect size. The innovative review technique we employed is particularly suitable for the meta-analysis of observed effect sizes and has been successfully applied in a meta-analysis of the relationship between private wealth and happiness (Jantsch & Veenhoven 2019). As more comprehensive and higher-quality data become available in the future, traditional meta-analysis methods may also become feasible.

6 Conclusions

Our four research questions can be answered as follows. Happiness is moderately to strongly related to productivity at work, and this relationship does not appear to be short-lived. The correlation between happiness and productivity varies across occupations and sectors, with the strongest association observed among managers and directors, as well as workers in the public sector. Furthermore, the link between happiness and productivity is stronger for the affective component of happiness—how well one feels most of the time—than for the cognitive component, which reflects the perception of achieving what one wants from life. However, evidence on the cognitive component remains limited, necessitating further research. Lastly, there are strong indications that happiness has a causal effect on productivity at work, but additional (quasi-)experimental studies are required to substantiate this claim.

Conceptually, our findings indicate that research on the 'happy productive worker' thesis (Hersey 1932) should examine not only domain-specific wellbeing measures in relation to productivity and other performance metrics but also context-free measures (Wijngaards et al. 2021). In line with the popular view on work-life integration (the blending of personal and professional responsibilities), performance at work is influenced not only by how people perceive and experience work but also by how they fare in other areas of life. Therefore, it is important to further theorize and empirically investigate how different life domains impact performance.

If there is indeed a causal link between happiness and productivity, this has important implications for business and management practices. Contrary to the common belief in a trade-off between employees' well-being and the achievement of economic objectives within companies, our research synthesis suggests that a more employee-centric management approach may foster productivity by promoting happiness. Especially in the field of organizational and occupational psychology, it has been shown that it is possible to create workplaces that enhance employee well-being (Fisher 2010). Examples include interventions and leadership strategies that improve employees' autonomy, competence, workspaces, and social relationships at work. In this regard, spending on employee well-being could be viewed as an investment rather than a cost.

The conclusion that happiness would increase productivity would also have important implications at the macro-level and underscore the importance to explore ways in which greater happiness may trigger greater productivity. Achieving this goal would make it easier to guide the transition towards a 'wellbeing economy' in the spirit of the 'Beyond GDP' movement (Stiglitz et al. 2009), where productivity is allocated to foster (e.g.) environmentally friendly drivers of wellbeing, while greater wellbeing contributes to raise productivity, and economic growth does not come at the cost of happiness. In this regard, the causal relationship between happiness and productivity at the regional and national should also be further addressed in future research.

Appendix

Meaning of signs and colors used in the finding tables

+	= positive correlation, significant
+	= positive correlation, not significant
–	= negative correlation, significant
–	= negative correlation, not significant
+/+	= negative correlations obtained with different sets of control variables
+\–	= positive on one indicator of this variable, negative on another
+|+	= positive significant and positive insignificant on different lags of time
+:–	= positive on one measure of happiness, negative on another
0	= absence of correlation
?	= undetermined relation
Sign in shading	= happiness was measured after indicators of rating of productivity

All these signs involve a link to an online finding page with full detail in the World Database of Happiness. Use control + click to view such a page

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Data availability All data for the research synthesis is freely available in the World Database of Happiness (https://worlddatabaseofhappiness.eur.nl/). In the article, we provide hyperlinks to every single finding in the findings archive.

Declarations

Conflict of interest The authors have not disclosed any conflict of interest.

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Studies included in this research synthesis are attached with a link below the reference. The links lead to a standardized description of the study on the World Database of Happiness. The codes denote place and year of the studies.

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