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Unemployment impairs mental health: Meta-analyses

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ABSTRACT

The effect of unemployment on mental health was examined with meta-analytic methods across 237 cross-sectional and 87 longitudinal studies. The average overall effect size was $d = 0.51$ with unemployed persons showing more distress than employed persons. A significant difference was found for several indicator variables of mental health (mixed symptoms of distress, depression, anxiety, psychosomatic symptoms, subjective well-being, and self esteem). The average number of persons with psychological problems among the unemployed was 34%, compared to 16% among employed individuals. Moderator analyses demonstrated that men and people with blue-collar-jobs were more distressed by unemployment than women and people with white-collar jobs. Linear and curvilinear moderating effects of the duration of unemployment were also identified. Furthermore, the negative effect of unemployment on mental health was stronger in countries with a weak level of economic development, unequal income distributions, or weak unemployment protection systems compared to other countries. Meta-analyses of longitudinal studies and natural experiments endorsed the assumption that unemployment is not only correlated to distress but also causes it. Seemingly inconsistent longitudinal results of older meta-analyses can be explained by retest artifacts. We also identified mental-health related selection effects during job loss and job search, but they are weak. With an effect size of $d = -.35$ intervention programs for unemployed people were found to be moderately effective in ameliorating unemployment-related distress among continuously unemployed persons.

1. Introduction

Several reviews and meta-analyses have been published that summarize and integrate the results of nearly a century of research on the psychological effects of unemployment (e.g. Catalano, 1991; Foster, 1991; Frese & Mohr, 1978; Fryer & Payne, 1986; Hammarström, 1994; Hanisch, 1999; Kasl, Rodriguez, & Lasch, 1998; McKee-Ryan & Kinicki, 2002; McKee-Ryan, Song, Wanberg, & Kinicki, 2005; Murphy & Athanasou, 1999; Winefield, 1995). While these studies have considerably improved our knowledge, some important questions have not been answered in a satisfactory manner up to now, for example the questions for moderators of the effects of unemployment on mental health and the question of causality. The present meta-analytic investigation will give answers to these issues.

2. Existing meta-analyses

To our knowledge, Foster (1991) was the first researcher interested in unemployment who used modern meta-analytic techniques. His interesting work is not well known, presumably because the author hid it in the appendix of his dissertation thesis. Foster integrated 22 effect sizes from 10 primary studies. He found a surprisingly small mean effect size which seems

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to contradict earlier narrative reviewers who concluded that being unemployed has a considerable negative effect on mental health.[1]

Murphy and Athanasou's (1999) meta-analysis of the effects of unemployment on mental health was especially concerned with problems of causality. It included nine longitudinal studies. These authors reported that job loss was associated with a significant increase in distress symptoms, whereas finding a new job was associated with a significant reduction of distress, supporting the assumption that unemployment is not only correlated with distress, but actually *causes* distress. Surprisingly, the effect size for changes from employment to unemployment was only of a small size, while the effect size for the change from unemployment to (re)employment was considerably larger. Murphy and Athanasou (1999) also conducted moderator tests for measurement method (General Health Questionnaire vs. other measures of mental health), age, gender, and whether the study was of European vs. Anglo-saxon origin. However, no significant moderating effects were found in these analyses.

Finally, a recently published meta-analysis containing 104 studies of which 67 included an employed comparison group found a medium-size cross-sectional difference between employed and unemployed persons with regard to mental health (McKee-Ryan et al., 2005). The authors also meta-analysed longitudinal studies and reported an effect sizes for job loss that was of small size, similar to Murphy and Athanasou's result. However, the effect size for the improvement in mental health that is associated with finding a new job after unemployment was of large size and was also considerably larger than the respective effect size reported by Murphy and Athanasou. Thus, the puzzling difference in the size of the effects for changes into and out of unemployment was replicated in this meta-analysis, with the difference being even stronger than in the previous meta-analysis. A test for selection effects, comparing unemployed individuals who subsequently found reemployment with unemployed individuals who remained unemployed did not reveal a significant difference. Furthermore, whether school graduates or adults were studied was found to be a significant moderator variable with larger effects among school graduates compared to adults. Unemployment duration also emerged as significant moderator variable: the negative effects of unemployment on mental health were larger among long-term unemployed persons ($\geqslant$6 months) compared to short-term unemployed persons (<6 months). The national unemployment rate and the generosity of a country's unemployment protection system were not identified as significant moderators. This study also included a number of interesting meta-analytic findings concerning the *within-group* correlation of well-being with other variables of interest, e.g. coping resources, computed separately for unemployed people.

In sum, the existing meta-analyses have provided a large number of valuable insights on the relationship between unemployment and mental health. However, they are only partly in agreement with each other with regard to the important question of the average size of the negative effect of unemployment on mental health. Thus, it is not clear yet how strong the threat to public health that unemployment poses really is. Furthermore, important moderators were either not tested at all (e.g. whether a person belongs to an ethnic or cultural minority group) or were tested with inadequate power, e.g. gender. As a result, the existing meta-analyses paint a picture of a highly stable negative effect of unemployment on mental health that is moderated by few, if any, other variables, a picture that may be misleading. Finally, the problem of causality has also not found a satisfactory solution yet. Two studies meta-analysed longitudinal data, but both came to rather puzzling results (McKee-Ryan et al. 2005; Murphy & Athanasou, 1999). Both studies found that the deterioration in mental health that people suffer when they lose their jobs is considerably weaker than the improvement of mental health that accompanies reemployment. Thus, a cycle of job loss, unemployment and subsequent reemployment would in sum be a *positive* experience according to these results. In the end, a person affected by unemployment would feel better than he or she did before becoming unemployed, a conclusion that we find difficult to believe. Furthermore, the existing meta-analyses implicitly suggest that the distress that unemployed people experience is mainly caused by unemployment. However, the possibility of reverse causation must also be considered. It appears to be likely that individuals with mental health impairments will have an increased probability of job loss and will have more difficulties in finding new jobs when unemployed than more healthy individuals. Both processes could lead to an accumulation of distress symptoms among unemployed samples although these symptoms were not caused by unemployment but preceded it. Only McKee-Ryan et al. (2005) conducted one of several possible tests but did not find a significant effect, probably due to a lack of test power. Thus, the question of selection effects has also not been satisfactorily answered up to now.

The following sections will outline the general association between unemployment and mental health, potential moderating effects, and the question of causality in more detail.

3. Unemployment and mental health

According to Jahoda's (1981, 1982) renowned latent deprivation model, distress is among unemployed people the consequence of a lack of five latent functions of employment (time structure, social contact, collective purpose, status, and activity), which correspond to important psychological needs. Only employment can provide these latent functions in a sufficient amount in modern societies, while unemployment leads to a state of deprivation, resulting in distress. Based on Jahoda's the-

[1] We interpret mental health as a broad concept, including both, negative and positive aspects of health. However, since the majority of the studies meta-analysed here used measures primarily reflecting the negative pole of mental health, such as depression or anxiety, we will also use the term "distress" in a pars-pro-toto fashion as synonymous to "mental health".

ory, Warr (1987, 2007) proposed a model including nine (later twelve) environmental factors, called "vitamins", which are also assumed to be necessary for mental health and are not available for unemployed people in a sufficient amount. In contrast to Jahoda, Fryer emphasized the role of poverty as a cause for unemployment distress arguing that financial deprivation severely frustrates the human desire for agency and self-directedness (Fryer, 1997; Fryer & Payne, 1986). In sum, the most prominent theoretical accounts concerning the question of unemployment and distress both regard unemployment as a cause of distress, but not the reverse. In accordance with these theoretical accounts, we expect to find a cross-sectional association between unemployment and reduced mental health. Since unemployment is simultaneously associated with several potential mediators of distress, we expect this effect to be of at least medium size with considerable practical importance.

4. Moderator variables

Moderator tests can help to identify the most distressed groups of unemployed persons who are in need of special help. Such tests also help to identify groups of persons who do not suffer when unemployed or suffer less than others do. To study the living conditions and coping mechanisms of such resilient people might enable us to develop successful interventions against unemployment distress. The following sections will shortly review some of the potentially moderating mechanisms that have been hypothesized in the literature on the psychological effects of unemployment.

4.1. Gender

Masculine identity is intricately linked to having a job in Western societies and is severely threatened by unemployment (Komarovsky, 1940; McFayden, 1995). Women, on the other hand, have access to alternative roles that may be able to serve as substitutes to employment, at least to a certain degree. Another argument is that unemployed married or cohabiting women can expect more financial support from their husbands than unemployed men can expect from their wives or partners, as men still earn more money than women do (Leana & Feldman, 1991; Shamir, 1985). Furthermore, stigmatization might be stronger against unemployed men than against unemployed women (Kulik, 2000; Shamir, 1985). Thus, although these arguments remain disputed (Kulik, 2000) we expect to find stronger negative effects of unemployment for men than for women.

4.2. Socioeconomic status/occupational status

Persons in high-status occupations usually have access to better financial and social resources and may possess better coping strategies than persons in low status occupations, probably cushioning the negative effects of unemployment (Little, 1976; Payne, Warr, & Hartley, 1984; Schaufeli & van Yperen, 1992). In addition, unemployment rates are usually higher among low status groups. This means that members of these groups know that it will be difficult to find a new job, a knowledge that may have negative effects upon their mood. Therefore, we expect to find a moderating effect of socioeconomic status with a stronger negative impact of unemployment on mental health among low status individuals than among high-status individuals.

4.3. Majority/minority status

Minority groups are often economically disadvantaged and suffer discrimination, which might result in an accumulation of stress factors among these groups, probably increasing the negative effects of unemployment (Jahoda, 1982; Shams & Jackson, 1994). Unemployment rates are also often higher among minority groups, probably leading to a bleaker future outlook. Therefore, we expect to find stronger negative effects of unemployment among minority members than among majority members.

4.4. Marital/relationship status

In general, spouses have been identified as one of the most important sources of social support (Väänänen, Vahtera, Pentti, & Kivimäki, 2005). Furthermore, social support was repeatedly shown to buffer the negative effects of unemployment (e.g. Atkinson, Liem, & Liem, 1986; Bolton, & Oatley, 1987; Gore, 1978). It has also been highlighted that in the context of unemployment, partners can offer not only emotional support, but also direct tangible support by stabilizing the couple's financial situations (Gore, 1978). Thus, it can be hypothesized that married or cohabiting individuals who have a stable "access" to a spouse as an important source of support should be less distressed by unemployment than single persons who have to cope without this kind of help (Leana & Feldman, 1991).

4.5. Age

It is usually assumed that persons of middle age suffer most from unemployment, while younger and older persons are less severely affected (e.g. Broomhall & Winefield, 1990; Eisenberg & Lazarsfeld, 1938; Hepworth, 1980). Middle-aged persons often have family responsibilities, increasing the financial importance of a job, while younger and older persons may have to cope with fewer financial pressures (Jackson & Warr, 1984). Furthermore, persons of middle age are likely to display

a strong career commitment, probably making employment more important for their mental health than it is for older workers who are close to the end of their careers, and for younger persons who are not yet completely integrated in the world of work and employment (Lahelma, 1989). We therefore expect that age moderates the negative effect of unemployment on mental health and that this moderating effect is characterized by a curvilinear association with large effect sizes for persons of middle age and small effect sizes for persons of younger and older age.

4.6. Duration of unemployment

A linear deterioration of mental health with increasing duration of unemployment can be expected because stress factors accumulate with prolonged unemployment: unemployed workers experience continued and more and more discouraging failures in job seeking, financial pressures become stronger as time passes, savings are used up, and personal or household items require repair or replacement (Jackson & Warr, 1984; Warr, Jackson, & Banks, 1982). However, more complex stage models assuming a non-linear association between length of unemployment and distress were also proposed (e.g. Eisenberg & Lazarsfeld, 1938; Harrison, 1976; Kaufman, 1982; Winegardner, Simonetti, & Nykodym, 1984). Although these models differ from each other in several ways, most of them concur in proposing a final stage of adaptation at a reduced but stable level of mental health after long durations of unemployment. We therefore tested for both, a linear as well as a curvilinear association.

4.7. Year of data collection

As a consequence of persistently elevated unemployment rates in many Western countries, a cultural change has been assumed to have taken place since the 1970ies, characterized by what may be called a "normalization" of unemployment. This means that being unemployed became more socially acceptable and less stigmatizing (Schaufeli & van Yperen, 1992; Sheeran, Abrams, & Orbell, 1995), possibly resulting in weaker differences between unemployed and employed persons in more recent studies. Thus, we expect larger effect sizes in older studies than in more recent studies.

4.8. Economic development

The renowned Marienthal-study draws a very clear picture of the devastating psychological consequences of unemployment that are associated with severe economic deprivation (Jahoda, Lazarsfeld, & Zeisel, 1933/1975). It seems reasonable to assume that the unemployed are a group of people who typically are more in danger of absolute poverty than other groups in most societies. Furthermore, the level of a country's economic development is negatively associated with the percentage of persons who are doomed to live under conditions of absolute poverty (United Nations Development Programme UNDP, 2003). Thus, it could be expected that unemployment in economically less developed countries is more harmful than unemployment in more developed countries.

4.9. Income inequality

Social cohesion is larger in more egalitarian societies than in societies characterized by inequality (Wilkinson, 1996). As a reduction of social contacts is one of the most important mediators of unemployment distress on the individual level (Jahoda, 1982; Warr, 1987), unemployment may have more deleterious effects in less egalitarian societies because unemployed persons may be in more danger of dropping out of social circles and of losing basic emotional bonds to society. Furthermore, as unemployed people can usually be expected to be at the lower end of a country's income distribution, their degree of economic deprivation is likely to be more severe in less egalitarian societies, were the differences between the poor and the rich are larger. Therefore, we expect that effect sizes from countries with strong inequalities with regard to the income distribution are larger than effect sizes from more egalitarian countries.

4.10. Unemployment protection

Unemployment protection systems differ widely between countries with regard to the wage replacement ratio, to coverage duration, and to the percentage of unemployed persons who receive unemployment benefits (International Labour Office, 2000). Therefore, the economic pressure unemployed people experience on average is also likely to vary between countries. As a result, the effect sizes for the negative effects of unemployment on mental health are likely to be larger in countries with comparatively low levels of unemployment protection than in countries with high levels of unemployment protection.

4.11. Labor market opportunities

A bad economic climate, expressing itself in a high unemployment rate, should be particularly threatening to unemployed persons because they perceive lowered opportunities for their job search and a lowered likelihood for reemployment, resulting in a depressed mood (Dooley, Catalano, & Rook, 1988; McKee-Ryan et al., 2005). Therefore, we expect that effect sizes

from countries with less favorable labor market opportunities are stronger than effect sizes from countries with more favorable labor market opportunities.

4.12. Collectivism/individualism

Persons in individualistic societies usually feel greater personal responsibility for their successes as well as for their failures (Hofstede, 2001). When they lose their job they may be more distressed than people in collectivistic societies who feel less personal responsibility and can rely on strong social networks to help them cope with unemployment (Martella & Maass, 2000). We therefore expect that the effects of unemployment on mental health are less severe in collectivistic countries than in individualistic countries.

5. The problem of causality

Two meta-analyses found significant changes in mental health that accompany transitions into or out of unemployment. When people lose their jobs, a significant deterioration in mental health occurs. When unemployed persons find new jobs, the mental health improves significantly (McKee-Ryan et al., 2005; Murphy & Athanasou, 1999). These results endorse the assumption that unemployment causes distress. However, the large difference in magnitude between the effects sizes for transitions into and transitions out of unemployment appears puzzling and casts some doubt on the validity of these results. As has already been said in the previous section, this would imply that a phase of unemployment with subsequent reemployment overall is a *positive* experience that *improves* mental health. Since this is unlikely in our opinion, we searched for an alternative explanation of this unexpected finding. One alternative explanation is the biasing influence of repeated measurement: having been asked how one feels already in the past might influence a person's answer when he or she is asked for a second time. Such unintended effects of repeated measurement have already been described by Windle (1954) who stated in his review that "there is a tendency for retests on personality inventories to show improved adjustment" (p. 623). Since this time numerous other studies have replicated this finding using a large range of measures of mental health (e.g. Arrindell, 2001; Choquette & Hesselbrock, 1987; Jorm, Duncan-Jones, & Scott, 1989). The General Health Questionnaire (Goldberg & Hillier, 1979), the most frequently used instrument to measure mental health in psychological unemployment research, has been shown to be is particularly susceptible to such effects (Ormel, Koeter, & van den Brink, 1989). Such an artificial reduction of distress scores would lead to an underestimation of the distressing effect of becoming unemployed and to an overestimation of the beneficial effect of reemployment, fitting well to the pattern of results found in the meta-analyses of Murphy and Athanasou (1999) and McKee-Ryan et al. (2005). In order to test the existence of such biasing effects of repeated measurement it is necessary to examine persons who do *not* experience a change in their employment status during a longitudinal study. We therefore integrated results from continuously employed and from continuously unemployed people as well as from youths who remained in the educational system throughout the longitudinal study, expecting to find a weak yet significant improvement in mental health for employees and students. For continuously unemployed persons we expected to find a null effect, because the positive effect of repeated measurement should at least be neutralized by the increasing stress of prolonged unemployment.

The reverse causation or selection hypothesis assumes that the association between unemployment and reduced mental health arises because persons with mental health problems have a higher probability of losing their jobs and – when unemployed – need more time to find new employment (Mastekaasa, 1996; Toppen, 1971; Winefield, 1995). In this line of thinking, an individual's unemployment is seen as a *consequence* of mental health problems. Such an effect could be the result of several processes. For example, mental health problems might reduce an employee's job performance or might increase absenteeism, which might in turn increase the likelihood of dismissal (Mastekaasa, 1996). Distress may also play a role with regard to the job search process: an employer's hiring decision is likely to be influenced by the applicant's impression management, a variable that may be influenced by mental health. Furthermore, psychological problems may be expected to reduce the effort and the efficiency of a person's job search to some extent, reducing the probability of reemployment Kanfer, Wanberg, and Kantrowitz (2001), for example, found negative effects of low self esteem on search intensity in their meta-analysis on factors influencing job search.

Causation and selection are not mutually exclusive processes, and it is possible that both contribute to the increased level of distress among the unemployed. However, selection effects have rarely been tested with meta-analytic means yet. McKee-Ryan et al. (2005) compared unemployed persons who would soon find a new job with unemployed persons who would remain unemployed. The comparison resulted in a weak, not significant difference. As the number of samples was small in this comparison ($k = 9$) the non-significant finding might be a result of low power. Furthermore, support for selection effects is also provided when distress is related to subsequent layoff among employed persons, or when distress is related to job-search success among school graduates. These tests have never been conducted meta-analytically but are also important. We expect to find support for such selection effects in the present study.

While the aforementioned longitudinal analyses help to shed some light on the causal mechanisms that lead to the relation between unemployment and mental health symptoms, they still are limited in their explanatory power due to the lack of randomized assignment of subjects to treatment conditions (Raudenbush, 2001). However, factory closures and other forms of mass layoffs can be regarded as natural experiments, having a comparatively high potential to support causal conclusions. In such a factory-closure study, large numbers of people are suddenly made redundant, usually by a force far beyond their control, e.g. the top management of a large corporation that decides that a certain plant is no longer needed. It can

be assumed that in such situations the influence of individual characteristics on the probability of unemployment is minimal. It is very unlikely that mental health symptoms are the cause of job loss when whole factories are shut down. Therefore, we will conduct an additional analysis including only such factory-closure studies.

Furthermore, in the present study we also meta-analysed the effectiveness of psychological interventions for unemployed people. Although the primary goal of such interventions usually is to improve the likelihood of reemployment, an improvement of mental health is also often intended. We expected to find a reduction of distress among continuously unemployed persons who took part in such an intervention program of medium to large size.

6. Methods

6.1. Literature search

Several computerized literature-databases were used in order to find relevant primary studies (PsycINFO, Sociological Abstracts, ERIC, Dissertation Abstracts International, Psyndex, WISO, Diss-CD). We also checked the reference lists of existing reviews and meta-analyses (see Section 1) and of those useful primary studies that we had already identified for hints to other useful studies. As amplification to these main search strategies, we screened the library catalogues of several German Universities for relevant degree dissertations, master theses, and other unpublished material.

6.2. Inclusion criteria

A study was included in the meta-analysis only when it matched all of the following seven inclusion criteria: (1) the publication year of the primary study is 1950 or later. (2) The study report was written in English or German. (3) Unemployed persons were compared to employed persons, or unemployed persons were examined longitudinally with regard to their mental health. (4) The measurement of mental health was done via a standardized and objective quantitative procedure, usually a questionnaire or a structured interview. (5) The data presentation allowed the computation of an effect size estimation. (6) The sample was not drawn from a population of patients of medical institutions (This criterion was formulated (a) to avoid possible confounding effects of physical illness and (b) to ensure comparability with the general, non-institutionalized population.). (7) The unemployed group was sufficiently homogenous (see below).

6.3. Operationalizations

6.3.1. Measurement of unemployment and employment

In the psychological literature, unemployed persons are sometimes mixed with other non-employed persons who do not seek work or who are not available for work, for example homemakers, students, and retired persons. In order to avoid this problem, we included only studies that matched one of the following categories: (1) all persons were officially registered as unemployed; (2) it was explicitly stated by the authors that unemployment was involuntary; (3) the study showed a sufficient differentiation of unemployed persons from other kinds of non-employed persons, e.g. by reporting the results for these groups separately; (4) the participants lost their jobs within the last 3 years due to a factory closure or a mass layoff and was still out of work at the time of measurement.

With regards to the comparison group, we accepted all studies that included a group labeled as "employed" or "working" or "with a job" or used a similar term.

6.3.2. Measurement of mental health

We selected six variables that were consistently used within the research field and that seemed unequivocal to us with regard to their relevance to mental health: (1) mixed symptoms of distress, (2) depression, (3) anxiety, (4) psychosomatic symptoms, (5) subjective well-being, and (6) self-esteem. These variables usually were strongly correlated with each other (see Section 6.4.2). Only studies that measured at least one of these variables were used in the meta-analysis.

6.4. Statistical computations for cross-sectional data

6.4.1. Computation of effect sizes

We used the standardized mean difference *d* as measure of effect size. Transformation formulas for different statistical coefficients, such as correlations, *t*-values or odds-ratios, were taken from Glass, McGaw, and Smith (1981), Hedges and Olkin (1985), Morris and DeShon (1997), Rosenthal (1994), and from Sánchez-Meca, Marin-Martinez, and Chacon-Moscoso (2003). Effect sizes were usually computed on study-level. The level of subgroups was chosen when data were reported separately for groups of persons that were relevant for the intended moderator analyses (e.g. separately for men and women).

6.4.2. Computation of overall effect sizes

Often authors of primary studies examined more than one indicator of mental health, e.g. depression plus anxiety. A formula provided by Marin-Martinez and Sanchez-Meca (1999, p. 34) based on a method reported in Rosenthal and Rubin (1986) was used to compute a combined, or "composite" effect size in such cases. This method requires the knowledge of

the mean correlations of the variables included in the composite. Therefore, a series of meta-analyses of all possible intercorrelations of the six indicators of mental health were conducted. The median of the resulting average intercorrelations (r = .48) was used to compute the composite effect size. Finally, a correction for unreliability (artifact-distribution method) was applied with the methods described by Hunter and Schmidt (1990), using the alpha-coefficients for internal consistency that were reported in the primary studies.

6.4.3. Meta-analytic model

It is often difficult to decide which kind of meta-analytic model is most appropriate for a specific research question (Cohn & Becker, 2003; Cooper & Hedges, 1994). Simulation studies showed that fixed effects models often have a liberal bias and random effects models often have a conservative bias (Overton, 1998). As a compromise, we decided to use the more conservative random effects model in our meta-analysis in order to get results that could be generalized to the whole field of psychological unemployment research (Hedges & Vevea, 1998), but also to report trends that are only marginally significant at the 10%-level of significance. Of course, these trends will be interpreted with considerable caution. The meta-analytic computations were done with SPSS, using syntaxes provided in Lipsey and Wilson (2001).

6.4.4. Moderator analyses

Moderator tests for demographic variables were done by weighted regression analyses, adapted for meta-analytic purposes by Lipsey and Wilson (2001). To check the stability of the weighted regression results, we repeated the analysis after exclusion of three studies (including eight separate samples) with outlying values that were revealed in the sensitivity analysis.[2] We also controlled the influence of three design variables that affected the magnitude of the effect sizes. These variables were language (English vs. German), communication medium (oral vs. written examination), and the use of a measure of psychosomatic symptoms (psychosomatic symptom measure used vs. not used).[3] Controlling the influence of these variables was done by the inclusion of three dummy variables representing the respective design factors as additional predictors into the regression analysis.

To test the possible curvilinear relationships of unemployment distress with age and with unemployment duration, we ran separate analyses including power polynomials in the regression equations (Cohen, Cohen, West, & Aiken, 2003).

Since we intended to conduct the moderator analyses for the economic and cultural variables on the level of countries, not on the level of single studies, we did not use regression techniques for this purpose. Instead, the countries were dichotomized corresponding to their values on each of the indicator variables (median split), resulting in two groups of countries for each variable, one with countries high and one with countries low on the respective variable (e.g. countries that had high vs. low unemployment rates during the time the primary studies were conducted). Finally, we compared the mean effect sizes for the two groups of countries with a subgroup moderator test, using the appropriate SPSS-syntaxes provided in Lipsey and Wilson (2001).[4]

6.4.5. Meta-analytic methods for case rates

As effect size statistics such as d are rather abstract figures, we also meta-analysed the proportions of "cases" of mental illness, i.e. the proportions of persons with a test value above a certain threshold that is regarded to be indicative of psychological problems of clinically significant intensity. Methods from Lipsey and Wilson (2001) were used for this purpose. Only well established clinical screening tests for mixed symptoms, for depression, or for anxiety were used in this analysis.

6.4.6. Measurement and coding of moderator variables

Gender was coded as the percentage of female persons in a sample. Age was coded as the average age of the sample in years. Minority/majority status was coded as the percentage of members of ethnic or cultural minority groups in a sample. Marital status was coded as the percentage of persons with an intimate relationship in a sample (married persons and cohabiting persons). Occupational status was coded as the percentage of blue-collar workers in a sample. Unemployment duration was coded as the average number of months out of work per sample. Year of data collection was coded as described in the research report. When it was not described there, an estimate was used that was derived be subtracting the average difference between the year of data collection and the publication year (4 years) from the publication year of the specific study.

A country's level of economic development was measured with the Gross Domestic Product per capita (GDP). Inequality was measured with the Gini Index, an index that measures the extent to which the distribution of income among individuals or households within a country deviates from a perfectly equal distribution. These data were retrieved from the Human Development Report (UNDP, 2003), and the World Labor Report (ILO, 2000). As indicators of labor market favorability, standardized national unemployment rates were used (OECD, 2005, 1995, 1985). As a measure of the level of unemployment

[2] We used standardized residuals to locate outlier studies (Hedges & Olkin, 1985; Huffcutt & Arthur, 1995) applying the SPSS-syntax provided in Rustenbach (2003).

[3] The effect sizes from studies published in English (d = 0.52) were significantly larger than the effect sizes in studies published in German (d = 0.40; p < .05). Studies presenting the items in written form to the participants had significantly smaller effect sizes (d = 0.48) than studies presenting the items in oral form (d = 0.63, p < .001). Composite effect size including psychosomatic symptoms (d = 0.38) were smaller than effects sizes without this variable (d = 0.53; p < .01). A more detailed documentation of these analyses is available from the first author.

[4] We did not control the influence of the design variables in the analyses involving country comparisons. This was not done because we used subgroup comparisons for these analyses instead of regression techniques. For such a subgroup comparison technique, to control for the design characteristics would have lead to a severe reduction of the number of studies per analysis considerably lowering test power.

Table 1
Meta-analyses of cross-sectional data: Comparison of unemployed and employed persons with regard to six indicator variables of mental health.

Mental health variable	*k*	*n*	*d*	d_{corr}	*SEd*	95% CI	*p*	*Q*	*H*
Overall	323	458,820	0.54	0.60	0.0184	0.50–0.57	.0000	2261.20***	2.65
Overall (out. ex)	315	209,379	0.51	0.56	0.0179	0.47–0.54	.0000	1762.86***	2.37
Mixed symptoms	163	375,163	0.55	0.59	0.0233	0.50–0.59	.0000	1066.01***	2.57
Mixed symptoms (out. ex.)	157	126,122	0.52	0.56	0.0235	0.48–0.57	.0000	838.39***	2.32
Depression	130	59,816	0.50	0.55	0.0260	0.45–0.55	.0000	475.09***	1.92
Anxiety	49	28,233	0.40	0.45	0.0379	0.32–0.47	.0000	175.92***	1.91
Psychosomatic symptoms	41	13,857	0.11	0.12	0.0467	0.02–0.20	.0000	152.46***	1.95
Subjective well-being	68	40,985	0.51	0.56	0.0449	0.43–0.60	.0000	488.72***	2.70
Self-esteem	87	28,680	0.45	0.51	0.0462	0.36–0.54	.0000	666.97***	2.78
Self-esteem (out. ex.)	85	28,280	0.38	0.43	0.0359	0.31–0.45	.0000	367.02***	2.09

Note. *k* = number of effect sizes; *n* = total sample size; *d* = random effects average effect size; d_{corr} = random effects average effect size corrected for unreliability; *SEd* = standard error of *d*; CI = 95% confidence interval for *d*; *p* = significance level of *d*; *Q* = heterogeneity test statistic; *H* = descriptive heterogeneity statistic; "out. ex." = all outlying studies were excluded (since outlying studies used only measures for mixed symptoms and for self-esteem they were only excluded from a minority of analyses).
*** $p < .001$.

protection, a list provided by the International Labour Office (2000) categorizing countries according to the generosity of their unemployment protection system was used (high level vs. medium and low level). Finally, index values adopted from Hofstede (2001) were used as indicators of individualistic/collectivistic culture. The number of years for which data were provided in these sources ranged from only 1 year for individualism/collectivism to several years for the unemployment rate. We always used the measurement year that was closest to the year of data collection in the respective primary study.

6.5. Meta-analysis of longitudinal data

We used repeated measures effect sizes (Morris & DeShon, 2002) to examine changes in mental health that accompany changes in employment status in longitudinal studies. Depending on the figures reported, the computation of repeated measures effect sizes is often only possible when the correlation between the Time-1-values and the Time-2-values is available or can be estimated (Morris & DeShon, 2002). As this correlation usually was not reported, a series of small-scale meta-analyses was run to estimate the average *T*1–*T*2-correlation for the relevant groups of persons (e.g. for persons who changed from unemployment to employment). These meta-analytically derived estimates of the *T*1–*T*2-corrrelations, ranging from *r* = .37 to .58, were then used to estimate the repeated measures effect sizes. Again, a random effects model was used to integrate the effect sizes meta-analytically (Hedges & Vevea, 1998; Lipsey & Wilson, 2001).

In order to test the existence of selection effects, cross-sectional comparisons at the first measurement point of longitudinal studies were conducted. We always compared persons with initially identical but ultimately different employment status (for example, continuously employed persons and persons who lost their job between *T*1 and *T*2) with regard to their mental health at *T*1.

7. Results

7.1. Sample description

We identified 237 cross-sectional studies containing 323 independent samples that compared unemployed and employed persons with regard to mental health. Altogether, nearly half a million participants were examined in these studies (*N* = 458,820). The median sample size was *Mdn* = 219 with a range from *Min* = 17 to *Max* = 248,393. The studies originated from 26 predominantly Western countries.[5] The studies were published between 1963 and 2004. Most samples (72%) were parts of journal publications, 15% were reported in books or book chapters, 8% in dissertation theses, and 4% came from other sources such as master theses or unpublished research reports.

7.2. Results from meta-analyses of cross-sectional data

7.2.1. Mean effect sizes

The meta-analysis of cross-sectional data revealed a clear association between unemployment and mental health: unemployed persons showed significantly more symptoms of distress and impaired well-being than employed persons did. With *d* = 0.54 the average overall effect was of medium size with a narrow confidence interval from 0.50 to 0.57 (see Table 1).

[5] These countries were: USA, UK, Germany, Australia, Finland, Canada, Netherlands, Ireland, Austria, Sweden, Italy, New Zealand, Denmark, India, Norway, Israel, France, China /Hong Kong, Mexico, Belgium, Turkey, Chile, Spain, Japan, Greece, Switzerland (ordered according to the number of studies published in the respective country).

Table 2
Moderator analyses of the cross-sectional association between unemployment and distress.

Moderator	*N*	beta	*Q*-model	*Q*-residual
Percentage of female	302	−0.22***	26.16***	527.63***
Percentage of female (with controls)	271	−0.20***	29.79***	348.71***
Percentage of blue-collar	148	0.10	2.40	254.65***
Percentage of blue-collar (with controls)	131	0.19*	14.40**	167.15**
Percentage of minority	87	0.12	2.22	152.92***
Percentage of minority (with controls)	80	0.18+	13.61**	99.83*
Percentage of married	154	−0.02	0.09	206.08**
Percentage of married (with controls)	142	−0.01	3.56	154.75
Mean age	307	−0.05	1.29	544.39***
Mean age (with controls)	276	0.00	18.76***	361.62***
Unemployment duration	165	0.13*	5.11*	276.01***
Unemployment duration (with controls)	144	0.15*	20.29***	170.84*
Year of data collection	323	−0.03	0.54	557.25***
Year of data collection (with controls)	290	−0.02	16.71**	373.18***

Note. *N* = number of samples; *beta* = standardized regression weight; *Q-model* = heterogeneity explained by meta-regression model; *Q-residual* = unexplained heterogeneity; "with controls" = computations done after exclusion of outlier studies and with important design characteristics held constant, the betas for the design characteristics are not reported here in order to save space; a weighted regression model with the method of moments was used.
+ $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < 0.001$.

With $d = 0.55$ the average weighted effect for mixed symptoms was significant and nearly identical to the effect size for the overall comparison using the composite effect sizes. The mean effect sizes for depression ($d = 0.50$), anxiety ($d = 0.40$), subjective well-being ($d = 0.51$) and self-esteem ($d = 0.45$) were also all significant and of medium size. With $d = 0.11$ the average weighted effect size for psychosomatic symptoms was small, albeit significantly different from zero. Therefore, we conclude that the negative effect of unemployment on mental health is of medium size. There is no specific type of distress that is related to unemployment in a particularly strong manner. However, for psychosomatic symptoms, the only variable that includes not only aspects of mental health, but also of physical health, only a small effect could be identified.

The correction for unreliability slightly enhanced the average effect sizes but did not change the general pattern of results (see Table 1). The exclusion of outlying studies slightly reduced the overall-effect (from $d = 0.54$ to 0.51) and the effects for mixed symptoms (from $d = 0.55$ to 0.52) and self-esteem (from $d = 0.45$ to 0.38).[6] However, the general pattern of results again did not change.

While the heterogeneity of effect sizes was reduced by the exclusion of outlying studies, it remained large ($H = 1.91$–2.70) and highly significant for all indicators of mental health, suggesting a search for moderating variables.[7]

The meta-analysis of case rates of psychological disorders estimated by clinical screening tests such as the GHQ (Goldberg & Hillier, 1979) or the Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) revealed the following results: the average proportion of "cases" in the unemployed samples was $p = .34$ (CI = .31–.38, $k = 76$, $n = 13388$, $Q = 1058.15$***). The average proportion of "cases" in the employed samples was $p = .16$ (CI = .14–.18, $k = 74$, $n = 74473$, $Q = 3528.85$***). Thus, the proportion of unemployed persons who must be seen as considerably distressed, probably in need of psychological or medical treatment, more than doubled the proportion of considerably distressed employed persons. This result shows that the medium effect size of $d = 0.51$ is of considerable practical importance.

7.2.2. Moderator analyses

7.2.2.1. Linear moderator tests. Gender, measured by the percentage of female participants in a sample, was found to be a significant moderator of the effects of unemployment on mental health. For samples with a large proportion of female participants, the effect sizes were weaker than for samples with a small proportion of female participants (see Table 2, note that in this table every line presents the results of a separate regression analysis; "with controls" means that the influence of design characteristics was controlled and outlying studies were removed). This moderator effect for gender was highly significant and comparatively strong (beta = −.22, $p < .001$). It remained highly significant and was only slightly weakened when the three outlying studies were removed from the data set and design characteristics were controlled (beta = −.20, $p < .001$).

For occupational status, i.e. the percentage of blue-collar workers in a sample, no significant effect could be detected in the uncontrolled analysis (beta = .10, $p = .12$). However, a significant effect emerged when the outlying studies were removed

[6] The outlier studies used only measures for mixed symptoms and self esteem. Therefore, the exclusion did not influence the results concerning the other indicator variables of mental health.

[7] As the *Q*-statistic depends on the number of samples involved in an analysis, we also report H here. This is a descriptive measure of heterogeneity that holds constant the number of studies, easing the comparison of different meta-analyses. Values exceeding $H = 1.5$ can be interpreted as indicating "notable heterogeneity" according to Higgins and Thompson (2002, p. 1553).

Table 3
Tests for curvilinear moderation effects.

Equation	Predictors	*N*	beta	*Q*-model	*Q*-residual
Moderator: age					
Uncontrolled analysis		307			344.39***
	Age		−0.03	1.43	
	Squared age		0.02		
	Cubic age		−0.01		
Controlled analysis		276		25.05***	359.40***
	Age		0.21+		
	Squared age		0.14*		
	Cubic age		−0.21+		
Moderator: unemployment duration					
Uncontrolled analysis		165		13.05*	266.65***
	Unemp. duration		0.29**		
	Squared unemp. duration		−0.83*		
	Cubic unemp. duration		0.66*		
Controlled analysis		143		28.05***	164.98*
	Unemp. duration		0.23*		
	Squared unemp. duration		−0.58*		
	Cubic duration squared		0.52+		

Note. *N* = number of samples; *beta* = standardized regression weight; *Q-model* = heterogeneity explained by meta-regression model; *Q-residual* = unexplained heterogeneity; controlled = outlier samples were excluded and three design variables were controlled, the betas for the design variables are not reported here in order to save space; for the analysis concerning duration, one study with a very large duration of unemployment (74 months) was also excluded; the betas results for the control variables are not reported here for reasons of space. All computations were done using a polynomial weighted regression model with the method of moments. Age and unemployment duration were centered before the regressions were conducted.

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

and the design features were controlled (beta = .19, $p < .05$). For blue-collar samples stronger effect sizes, i.e. stronger differences between employed and unemployed persons, were found compared with white-collar samples.

Average unemployment duration was also identified as a significant moderator variable: the longer persons were unemployed, the more pronounced were the negative effects of unemployment on mental health (beta = .13, $p < .05$). This effect changed only slightly when the outlying studies were excluded and design characteristics were controlled (beta = .15, $p < .05$).

Despite a weak trend in the controlled analysis, there was no clear evidence that minority status moderated the negative effects of unemployment on mental health. Marital/relationship status also did not moderate the negative effects of unemployment on mental health in the sample of studies meta-analysed here. Furthermore, no linear moderating effect for age was identified. Finally, the moderator tests for the year of data collection also did not reveal any significant findings, meaning that there is no "secular trend", i.e. no general tendency for the negative effects of unemployment on mental health to become stronger or weaker during the four decades covered by the data set used here.

7.2.2.2. Tests for curvilinear moderator effects. With regard to unemployment duration, the polynomial meta-regression revealed a significant linear association, as expected (beta = 0.29, $p < .01$, see Table 3). The quadratic term (beta = −0.83, $p < .05$) and the cubic term (beta = 0.66, $p < .05$) were also significant. This result was only slightly altered when the outlier studies were excluded and the design characteristics were controlled.[8]

Since this complex pattern of linear and curvilinear results is not easy to interpret, we constructed a graph by conducting separate meta-analyses for each month of unemployment. In other words, we conducted a meta-analysis with all studies for which the average length of unemployment was 1 month, another meta-analysis with average lengths of 2 months, 3 months, etc. This was possible up to month 13. For longer durations of unemployment it was necessary to use larger time intervals in order to get stable results, i.e. results that were based on a sufficiently large number of samples (see Fig. 1). The results show that there is a sharp increase of mental health symptoms during the 1st year of unemployment that peaks in the 9th month of unemployment with a large effect size of $d = 0.73$. Then, after a decline and some fluctuation, there is stabilization at medium levels of distress during the 2nd year and the first half of the 3rd year of unemployment. Finally, there is a renewed worsening of mental health symptoms after 29 months of unemployment. However, that last finding of a renewed increase of distress among the very-long-term unemployed should be interpreted with caution because the cubic term that is the statistical equivalent for this increase was only marginally significant in the controlled analysis. This finding is based on a small sample of primary studies ($k = 5$) and is possibly unstable.

[8] We also excluded a study with an extremely long average duration of unemployment - 74 months - in the controlled analysis.

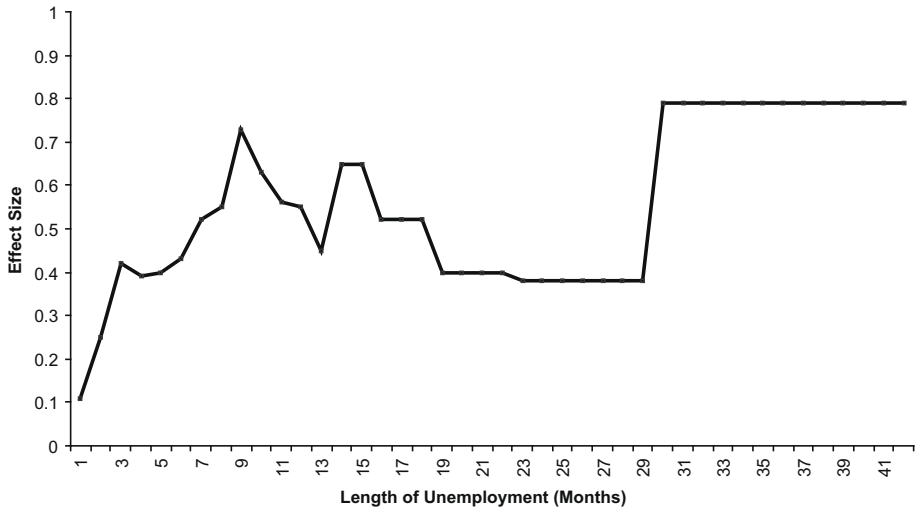

Fig. 1. Unemployment duration and impaired mental health. *Note.* For each time interval of unemployment duration a separate meta-analysis was conducted. The breadth of time intervals varied: 1 month for months 1–13; 2 months for months 14 and 15; 3 months for months 16–18; 4 months for months 19–22; 7 months for months 23–29; 13 months for months 30–42; one outlier study with an unemployment duration of 74 months was not included in the diagram. Altogether, 18 separate meta-analyses were conducted for this diagram with an average number of primary studies of $k = 8.8$. A positive effect size means that unemployed persons have a worse mental health than employed persons.

Table 4
Country differences as moderators of the unemployment–distress relationship.

Moderator	Subgroup	Q_b	k	n	d	95% CI	Q_w	H
Economic development (GDP)		11.84***						
	High		203	374,713	0.49	0.44–0.53	267.59**	1.15
	Low		120	84,107	0.62	0.56–0.68	276.74***	1.52
Inequality (Gini-index)		4.97*						
	High		215	392,789	0.57	0.52–0.61	323.32***	1.23
	Low		108	66,031	0.48	0.42–0.54	239.45***	1.50
Unemployment protection		8.61**						
	High		97	46,291	0.46	0.39–0.52	128.09*	1.16
	Low		221	407,495	0.58	0.53–0.62	423.25***	1.39
Unemployment rate		3.04+						
	High		160	120,972	0.55	0.50–0.60	257.07***	1.27
	Low		154	332,034	0.49	0.44–0.54	231.73***	1.23
Individualism/collectivism		1.57						
	Individualistic		242	419,742	0.55	0.51–0.59	345.68***	1.20
	Collectivistic		81	39,078	0.50	0.43–0.57	220.59***	1.66

Note. k = number of effect sizes; n = sample size; d = weighted average effect size; CI = 95% confidence interval for d; Q_b = between-group heterogeneity estimate; Q_w = within-group heterogeneity estimate; H = descriptive heterogeneity statistic.
+ $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

With regard to age, we found no evidence for the expected curvilinear association. Neither the quadratic term (beta = 0.02, n.s.) nor the cubic term (beta = −0.01, n.s.) were significant in the respective meta-regression (see Table 3). When the outlying studies were removed and design variables controlled, the quadratic effect was significant (beta = 0.14, $p < .05$), but the sign of the beta was unexpectedly positive, indicating a U-shaped association. This means that middle-aged persons tended to suffer *less* from unemployment than younger or older persons, which is a surprising result. There were also marginally significant linear and cubic trends found in this meta-regression (beta = 0.21, $p = .08$ and beta = −0.21, $p = .08$). Since these results were inconclusive and unstable (see below), we abstained from constructing a graphical display.

7.2.2.3. Multivariate stability of moderator test results. In order to control for confounding effects of interrelated moderator variables it would have been desirable to conduct a multivariate analysis including all of the moderators simultaneously. However, this was not possible because the present data set is limited by a high number of missing values with regard to the moderator variables, a situation that is not unusual for meta-analytic data sets. Therefore, we chose an alternative meth-

Table 5
Meta-analyses of longitudinal studies: Mental health changes for six groups of persons.

Group	*k*	*n*	*d*	*SEd*	95% CI	*p*	*Q*	*H*
Employed–unemployed	19	1933	0.19	0.0469	0.10–0.29	0.0000	55.06***	1.75
Unemployed–employed	45	4513	−0.35	0.0374	−0.42 to −0.28	0.0000	185.30***	2.05
School–unemployed	15	957	0.10	0.0984	−0.09 to 0.30	0.2988	91.70***	2.56
School–employed	16	6023	−0.30	0.0782	−0.45 to −0.14	0.0001	355.10***	4.87
Employed–employed	28	24,679	−0.06	0.0247	−0.11 to −0.01	0.0155	198.54***	2.71
Unemployed–unemployed	61	6565	−0.08	0.0322	−0.14 to −0.01	0.0185	295.25***	2.22
School–school	14	5564	−0.15	0.0465	−0.24 to −0.06	0.0013	107.91***	2.88

Note. *k* = number of correlations; *n* = total sample size; *d* = average repeated measures effect size; *SEd* = standard error of *d*; CI = 95% confidence interval for *d*; *p* = significance level of *d*; *Q* = heterogeneity test statistic; *H* = descriptive heterogeneity statistic; all meta-analytic computations were done using a random effects model applying the method of moments; a positive effect size indicates an increase of distress symptoms between *T*1 and *T*2.
*** $p < .001$.

od to control possible confounding effects of interrelated moderator variables. First, we checked the intercorrelation matrix of the moderators for significant associations. Then we conducted a series of six meta-regressions. In each of these regressions, we included two moderator variables that were significantly correlated with each other in order to control confounding influences. For reasons of space we will only report a verbal summary of these analyses here.[9]

The results showed that the moderating effect of sex was stable when possible confounding influences (occupational status and year of data collection) were controlled. There was also evidence for the stability of the moderating effects of unemployment duration when possible confounding influences (year of data collection and minority status) were controlled, though the analysis with minority status was hampered by a very small number of studies. Thus, "stability" only means stability of beta-coefficients with regard to this analysis, not stability of significance levels. Whether occupational status really moderates the negative effects of unemployment on mental health remains uncertain, because this effect appears to be at least partly caused by the confounding influence of gender. The moderating effect of occupational status was reduced from beta = 0.19 to 0.13 and was only marginally significant when gender was controlled. The unexpected curvilinear association between age and unemployment distress revealed itself as an unstable phenomenon, because it vanished when marital status was controlled. The weak moderating trend for the percentage of minority members was reduced and not significant when relationship status was controlled.

7.2.2.4. Differences between countries. In less affluent countries with a small GDP per capita the negative effects of unemployment were larger ($d = 0.62$) than in more affluent countries with a large GDP ($d = 0.49$; see Table 4). The difference was highly significant ($Q_b = 11.84$; $p < .001$). In other words, the negative effects of unemployment on mental health were alleviated in countries with a high level of economic development in comparison to countries with a low level of economic development. Inequality also had a moderating influence on the negative effects of unemployment on mental health: Countries with high Gini-scores were characterized by significantly larger effect sizes than countries with low Gini-scores ($d = 0.57$ vs. $d = 0.48$, $Q_b = 4.97$; $p < 0.05$). Thus, in countries with high levels of income inequality the negative effects of unemployment on mental health were more severe than in more egalitarian countries.

Furthermore, level of unemployment protection also moderated the difference between employed and unemployed persons with regard to mental health. In countries with a medium or low level of unemployment protection the effect sizes were significantly larger than in countries with a high level of unemployment protection ($d = 0.58$ vs. 0.46, $Q_b = 8.61$; $p < .01$).

There was only a marginally significant moderating effect for labor market favorability as measured by the national unemployment rate ($Q_b = 3.04$; $p < .10$). For countries with high unemployment rates, we found slightly larger effect sizes than for countries with low unemployment rates ($d = 0.55$ vs. 0.49). Thus, the assumption that unfavorable labor market conditions may be associated with increased distress among the unemployed was only weakly endorsed by the results.

Effect sizes were larger in countries with an individualistic culture than in countries with a collectivistic culture, as expected. These differences were not significant, however. Thus, a country's level of individualism/collectivism did not moderate the distressing effects of unemployment ($Q_b = 1.57$; n.s.).[10]

In order to diagnose confounding effects of interrelated moderator variables we also run a series of χ^2 tests. We found a highly significant negative association between income inequality as measured by the Gini Index and the generosity of the unemployment protection system ($p < .01$). There was also a significant positive association between the national unemployment rate and individualism ($p < .05$). The consequences of these findings will be discussed below.

[9] A more detailed documentation is available from the first author.
[10] We also cross-validated these results concerning moderators on country level using different measures of the moderator variables. We used the Human Development Index as alternative measure of economic development, the percentage of persons living under conditions of poverty as alternative measure of income inequality, the Labor Market Security Index as alternative measure of labor market favorability, and scores for individualism/collectivism from a team of authors independent from Hofstede. The results of these additional analyses were very similar to the results reported here. A detailed documentation is available from the first author.

Table 6
Interventions as a moderator of mental health changes among continuously unemployed persons.

Group	Q_b	k	n	d	SEd	95% CI	p	Q_w	H
	29.62***								
Intervention		16	1899	−0.35	0.0595	−0.47 to −0.23	.0000	55.63***	1.93
No intervention		45	4666	0.03	0.0361	−0.04 to 0.10	.4491	30.17	0.83

Note. k = number of correlations; n = total sample size; d = average repeated measures effect size; SEd = standard error of d; CI = 95% confidence interval for d; p = significance level of d; Q_b = between-group homogeneity estimate; Q_w = within-group homogeneity estimate; H = measure of heterogeneity with k held constant; all meta-analytic computations were done using a random effects model applying the method of moments; a positive effect size indicates an increase of distress symptoms between $T1$ and $T2$.
*** $p < .001$.

7.3. Results from meta-analyses of longitudinal data

We were able to retrieve 86 longitudinal studies that could be integrated in the meta-analysis. The mean time interval between the measurement points was 16 months in these studies with a range from 3 days to 7.5 years.

7.3.1. Mean changes in mental health from T1 to T2

We found a significant increase of distress symptoms for persons who lost their jobs between the measurement times of longitudinal studies ($d = 0.19$, $p < .001$; see Table 5). Furthermore, there was a significant reduction of distress for unemployed persons who found new jobs between $T1$ and $T2$ ($d = -0.35$, $p < .001$). There was also a significant reduction of distress symptoms for young persons who found jobs after school ($d = -0.30$, $p < .001$). For youths becoming unemployed after school a weak non-significant increase of distress symptoms was found ($d = 0.10$, n.s.). In summary, these results endorse the hypothesis that unemployment not only correlates with, but also causes mental health impairments.

Note that the reduction of distress associated with reemployment ($d = -0.35$) and first-time employment ($d = -0.30$) was stronger than the increase of distress associated with job loss ($d = 0.19$) or becoming unemployed after school ($d = 0.10$). Similar differences were also reported by Murphy and Athanasou (1999) and McKee-Ryan et al. (2005), although these authors did not differentiate between adults and youths. Thus, we are again confronted with the puzzling finding that becoming employed is generally associated with larger absolute changes in mental health than becoming unemployed. As expected, the longitudinal results for continuously employed persons and for young persons who stayed within the educational system shed some light on this irritating finding: continuously employed persons showed a small but significant reduction in distress between the first and the second measurement point ($d = -0.06$, $p < .05$). Thus, when all participants were in an employment situation at $T1$ and at $T2$ of a longitudinal study that could be labeled as the "standard" situation for members of the labor force in industrialized societies a slight improvement in mental health was observed. A similar effect was revealed for youths: when young people stayed within the educational system between $T1$ and $T2$, their distress levels decrease significantly ($d = -0.14$, $p < .01$).

When we corrected the effect sizes of the two adult change groups for the tendency to feel better when tested repeatedly (by subtracting the employment-to-employment effect from the employment-to-unemployment effect and from the unemployment-to-employment effect) both effect sizes became much more similar in their absolute size with $d = 0.25$ for job-losers and $d = -0.29$ for persons finding new jobs. For young people, such a correction also led to much more similar effect sizes, with $d = 0.24$ for persons who became unemployed after school and $d = -0.27$ for young people who were successful in their job hunt.

As expected, intervention studies that tested the effectiveness of psychological or other programs intending to help the unemployed lead to reductions of distress symptoms. With $d = -0.35$ this effect was of medium size and highly significant ($p < .001$). A moderator analysis comparing intervention and non-intervention samples resulted in a significant difference ($Q_b = 29.62$; $p < .001$) with intervention studies showing better mental health outcomes than non-intervention studies (see Table 6). Thus, we can conclude that the intervention programs meta-analysed here were effective because they were associated with an improvement in mental health that is not typical for permanently unemployed persons.

The meta-analysis of longitudinal data of continuously unemployed persons who did not take part in an intervention program revealed an increase in distress scores that was very weak and not significant ($d = 0.03$, n.s.). This result is at odds with the significant moderator effect of unemployment duration that was identified in the cross-sectional analysis and clearly contradicts the opinion of the large majority of unemployment scholars who generally assume that long-term unemployment is more impairing than short-term unemployment. Again, the aforementioned general trend towards an improvement of mental health scores during the course of longitudinal studies helped to explain this unexpected result: correcting for this general trend lead to an effect sizes of $d = 0.09$ which is more consistent with the results of the cross-sectional analysis.[11]

[11] Another explanation for the weak increase in distress among continuously unemployed persons could be selective panel attrition. When distressed persons have a higher probability of dropping out during the course of a longitudinal study than persons who are not distressed, the resulting estimate of the mental health deterioration between $T1$ and $T2$ would be artificially reduced. To check this assumption we screened all studies for hints to such a kind of attrition bias. Only in one of 17 studies that tested for attrition was a significant difference found, with dropouts reporting slightly more distress at $T1$ than respondents who did not drop out. Thus, there is only weak evidence that selective attrition might have biased the results of the meta-analysis for continuously unemployed persons.

Table 7
Meta-analyses of longitudinal studies, cross-sectional comparisons at *T*1: Selection effects.

Status *T*1–*T*2	*k*	*n*	*d*	*SEd*	95% CI	*p*	*Q*	*H*
Employed–unemployed vs. employed–employed	21	18,477	0.23	0.0402	0.15–0.31	.0000	36.50*	1.35
Unemployed–unemployed vs. unemployed–employed	49	13,259	0.15	0.0382	0.08–0.23	.0000	136.99***	1.69
School–unemployed vs. school–employed	17	12,163	0.08	0.0281	0.03–0.14	.0033	17.22	1.04

Note. *k* = number of correlations; *n* = total sample size; *d* = average weighted effect size; *SEd* = standard error of d; CI = 95% confidence interval for *d*; *p* = significance level of *d;* *Q* = heterogeneity test statistic; *H* = descriptive heterogeneity statistic; all meta-analytic computations were done using a random effects model applying the method of moments; a positive effect size means that (1) continuously unemployed persons showed more distress at *T*1 than unemployed persons who found new jobs until *T2*, (2) job-losers showed more symptoms of distress at *T*1 than continuously employed persons, (3) school leavers who became unemployed showed more symptoms of distress at *T*1, when still in school, than school leavers who became employed later on.
* $p < .05$.

Table 8
Factory-closure studies in comparison to other designs.

Moderator	Subgroup	Q_b	*k*	*n*	*d*	95% CI	Q_w	*H*
Factory closure vs. other design		3.99*						
	Factory-closure		27	4246	0.38	0.25–0.51	48.10**	1.36
	Other design		288	205,133	0.52	0.48–0.55	352.83**	1.11

Note. *k* = number of correlations; *n* = total sample size; *d* = average repeated measures effect size; *SEd* = standard error of *d;* CI = 95% confidence interval for *d*; *p* = significance level of *d*; Q_b = between-group homogeneity estimate; Q_w = within-group homogeneity estimate; *H* = descriptive measure of heterogeneity; all meta-analytic computations were done using a random effects model applying the method of moments; outlier studies were excluded.
* $p < .05$.
** $p < .01$.
*** $p < 0.001$.

7.3.2. Selection effects: Cross-sectional comparisons at T1

Our tests concerning selection effects revealed small but significant differences in mental health between persons who were more successful in the labor market and persons who were less successful, always favoring the former group (see Table 7). Employed persons who lost their jobs during the course of a longitudinal study showed more signs of distress than continuously employed persons already at the first measurement point (*T*1), when both groups were still employed. This effect was small, but highly significant ($d = 0.23$; $p < .001$). Furthermore, continuously unemployed persons showed more symptoms of distress at *T*1, when both groups were still unemployed, than those unemployed persons who managed to find a new job in the near future. With $d = 0.15$ the effect was also small, but highly significant ($p < .001$). A similar result was found for school graduates: those young persons who became unemployed after finishing school showed more symptoms of distress while at school than those young persons who managed to find a job after school. This effect was very small ($d = 0.08$), but still significant ($p < .01$).

7.3.3. Factory-closure studies

The comparison of factory-closure studies with other studies showed a significant moderator effect ($Q_b = 5.61$; $p < .05$; see Table 8). The difference was also significant when the outlier studies were excluded ($Q_b = 3.99$; $p < .05$). The mean effect size for factory-closure studies ($d = 0.38$) was smaller than the mean effect size for studies with other designs ($d = 0.55$). Nevertheless, the effect for factory-closure studies was still of medium size and highly significant, endorsing the assumption of a causal link from unemployment to impaired mental health.[12]

8. Discussion

8.1. Summary of meta-analytic findings

The present meta-analytic investigation demonstrated that the negative effect of unemployment on mental health has a size of $d = 0.51$, meaning that the health level of unemployed persons is half a standard deviation below the health level of employed persons. This effect is a rather broad one, since it can be detected on a large range of mental health indicators (mixed symptoms of distress, depression, anxiety, psychosomatic symptoms, subjective well-being, and self-

[12] We also conducted several tests for publication bias which cannot be reported here for reasons of space. Few and only weak signs for the existence of such a bias were detected. In sum, it is unlikely that publication bias poses a relevant threat to the validity of the meta-analytic results presented here. A detailed documentation is available from the first author.

esteem). The effect has considerable practical importance, as it is equivalent to an increase in the rates of persons with psychological problems with potential clinical severity from 16% to 34%. Furthermore, the negative effect of unemployment was stable throughout the last 30 years. In other words: societies do not "habituate" to high unemployment rates. Other tests demonstrated that gender, occupational status, and unemployment duration are significant moderators of the distressing effect of unemployment. The effect sizes are larger among men, blue-collar workers, and long-term unemployed persons than among women, white-collar workers, and short-term unemployed persons. For unemployment duration we also found a curvilinear relationship that is characterized by a stabilization of mental health symptoms at an elevated level during the second year of unemployment and a renewed increase of distress among very-long-term unemployed persons. Furthermore, countries differ considerably with regard to the distress their unemployed citizens experience: unemployment has worse negative effects on mental health in economically less developed countries, in countries that are characterized by an unequal income distribution, or in countries with a weak unemployment protection system compared to affluent countries, egalitarian countries, and countries with a strong unemployment protection system.

The meta-analysis of longitudinal studies demonstrated that losing a job is associated with negative changes of mental health and that finding reemployment after a period of unemployment is associated with an improvement of mental health. These findings endorse the assumption that unemployment is not only correlated to distress, but actually causes it. The results for youths also endorse this assumption: a change from school to employment is accompanied by a strong gain in mental health, similar to the effect of reemployment found among adults. Becoming unemployed after school, on the other hand, leads to a insignificant decrease of mental health that is not typical for this age group, as can be inferred from the weak but significant improvements of those young people who stay within the educational system. The hypothesis of a causal effect of unemployment on mental health was further supported by the results for factory-closure studies: even when the probability that personal characteristics caused the loss of the job was extremely low, unemployed people were still more distressed than employed people. The average effect size was still of medium size in these studies.

The analysis of continuously employed persons and of persons who stayed in school throughout the course of longitudinal studies revealed signs of an artificial improvement of tests scores that is probably caused by repeated measurement. This general trend towards a slight improvement of test scores helps to understand the finding that the improvement in mental health that typically occurs after reemployment appears to be considerably larger than the deterioration that occurs after job loss. If one corrects these effects for the aforementioned general positive trend, the effect sizes for job loss and reemployment become much more similar. The same is true for youths and the effect sizes for changes from school to employment and changes from school to unemployment. Thus, it is unlikely that unemployment is an overall *positive* experience, as could be inferred from the puzzling results of the earlier meta-analyses.

We also found evidence for selection effects, supporting the assumption that there is a causal link from mental health to a person's employment status: persons with impaired mental health are more likely to lose their jobs or to become unemployed after leaving school. Among unemployed people, impaired mental health lowers the chances of finding a new job. In other words, there is a mechanism working in the labor market that creates additional disadvantages for those people who are already disadvantaged with regard to their mental health. However, while these selection effects were clearly significant, the respective effect sizes were weak, indicating that the practical importance of these effects might be limited.

Last not least, intervention programs were found to have positive effects on mental health among continuously unemployed people. This effect was of medium size.

8.2. Discussion of specific findings

8.2.1. Confounding variables

The possibility exists that an unknown third variable may influence both employment status as well as mental health, creating a spurious correlation between unemployment and distress. One possible confounding factor – physical health – has been repeatedly discussed in the literature (e.g. Winefield, 1995). Yet, the fact that we excluded studies drawing samples from populations of medical institutions should have limited this possible biasing effect. The finding that psychosomatic symptoms, the only variable that included aspects of physical health, showed the weakest effects of all measure of health analysed here is also inconsistent with the assumption of a relevant confounding influence of physical health.

Another problem of confounding effects possibly threatened the moderator analyses presented here: highly intercorrelated moderator variables could have influenced each other and perhaps caused misleading conclusions. Our analyses showed that the moderating effects of gender and length of unemployment were stable when possible confounding influences were controlled. However, the effect of occupational status was only partially stable and is in need of further scrutiny. The same is true for the renewed increase of symptom levels among very-long-term unemployed persons which was also only partially stable. Thus, with regard to these latter findings further research is needed.

With regard to the moderators on country level, our analysis showed that the Gini index and level of unemployment protection were strongly and significantly correlated. Thus, the concepts of income inequality and unemployment protection were not adequately distinguishable within the sample of countries analysed here. In our opinion, level of unemployment protection may be seen as an aspect of a society's level of income inequality with particular relevance for unemployed people. It may act as a mediator variable between inequality and unemployment distress. However, this assumption could not be tested with the present data set.

8.2.2. Correction of longitudinal findings

An alternative explanation for the inconsistent effects of changes into and out of unemployment could be that experiencing a cycle of job loss, unemployment, and reemployment triggers some kind of real psychological growth. Recent research on posttraumatic growth (Zoellner & Maercker, 2006) has demonstrated that individuals who experience highly stressful live events sometimes are able to use this experience as an opportunity for further psychological development. However, while growth is one outcome of a challenging experience, such an experience can also result in recovery, i.e. the return to the old level of psychological functioning, or to survival, i.e. existence at a lower level of psychological adjustment compared to pre-challenge (O'Leary and Ickovics, 1995). There is no obvious reason why growth should be more frequent than survival after experiencing unemployment. Furthermore, such an explanation would completely ignore the trend towards "always feeling better" that was found among the groups without changes in their employment status. Whether this trend is a retest artifact or not (a reviewer opined for real improvement), it has nothing to do with the *specific* effects of job loss and reemployment. Thus, it must be taken into account when interpreting the results of the longitudinal studies in our opinion. We have done this and found very little evidence for something like "post-unemployment growth".

8.2.3. Lack of moderating effects of age and marital status

A surprising finding of the present meta-analysis is the preliminary evidence for a U-shaped association between age and unemployment distress, with youths and persons older than 50 suffering more from unemployment than middle-aged persons. These results were unstable when confounding influences were controlled and should therefore be treated with great caution. However, the more interesting finding is that in none of our analyses emerged any evidence in support of the traditional hypothesis of an inverted U-shaped association. Note that ours is not the first meta-analysis that could not endorse this hypothesis. McKee-Ryan et al. (2005) compared school-leaver samples and adult samples and found significantly larger effect sizes for the school-leavers, a finding that is also contradictory to the inverted U-shape hypothesis.

However, some primary studies have reported results supporting the inverted U-shape hypothesis (e.g. Jackson & Warr, 1984). A possible explanation of the conflicting findings may be that these primary studies did not include employed comparison groups but were restricted to unemployed persons. In such a design a general phenomenon that affects all people, unemployed as well as employed persons, cannot be separated from a phenomenon that is specific for unemployment. Furthermore, an inverted U-shaped curve for the association of age and depression/negative well-being has recently been demonstrated to be the rule in a large range of populations in many countries when important demographic variables such as education, race, and work-force status are controlled (Blanchflower & Oswald, 2008). Thus, the low mental health for middle-aged persons that was reported by Jackson and Warr (1984) using a relatively homogenous sample of unemployed men from blue-collar jobs might have been a reflection of this *general* age-related effect, but not an effect that is unique for unemployment. In the present meta-analysis the use of comparison groups helped to isolate the role of age as a moderator of the unemployment-mental health relation from the *general* influence of age on mental health.

The fact that we found no signs of a moderating effect of relationship status was also unexpected. A possible explanation might be that having a spouse is not always tantamount to receiving large amounts of social support. Processes of social undermining, i.e. negative social support in intimate relationships, have also been reported among unemployed people (Vinokur & van Ryn, 1993) and may minimize or even eliminate the positive effects of having a partner.

8.3. Research gaps

Although the present meta-analysis has answered many questions, much work remains to be done, particularly with regard to the moderator effects. For minority status, for example, we found only a weak trend. However, this analysis was hampered by a comparatively small number of primary studies. A future meta-analysis with access to more studies involving minority members will possibly be more successful in demonstrating this effect. Furthermore, moderating effects for culture (individualism/collectivism) and favorability of the labor market could also not be identified here, although there was a weak trend for favorability of the labor market. However, such effects might be weak, possibly much weaker then the monetary-related moderator effects on country-level that we were able to demonstrate here (economic development, income inequality, and unemployment protection). For such weak effects the number of 26 countries that contributed to the present data set might still have been too low. The preponderance of industrialized countries with "Western" culture in our data set probably also impeded these analyses. Thus, more research with regard to these questions is necessary.

Those moderator effects that could be demonstrated in the present meta-analysis are also in need of further scrutiny, as the question of their exact structure and meaning is not completely answered yet. Gender, for example, emerged as a highly significant and stable moderator of the negative effects of unemployment on mental health. This means that the difference between unemployed and employed persons with regard to mental health is larger among men than among women. However, we do not know from this result whether this difference in effect sizes arises because unemployed men suffer more than unemployed women, or whether it arises because men feel better when they have a job than women feel when they have a job. Both possibilities would have different implications. To get a more complete picture of the moderator effect, meta-analytic comparisons of unemployed men and unemployed women on the one hand and comparisons of employed men and employed women on the other hand are required. Similar comparisons would be necessary for a full understanding of the moderator effect of occupational status. Recently, McKee-Ryan et al. (2005) took the first step here by meta-analyzing

correlations between demographic variables and distress among samples of unemployed persons. However, the number of samples included in these analyses is low in most instances, showing that further work needs to be done here.

While researchers have collected considerable evidence in support of the hypothesis that unemployment is not only associated with distress but is a cause of distress, the mechanisms that mediate that association are not well known as of yet. Jahoda's (1981, 1982) latent deprivation model, Warr's (1987) vitamin model, and Fryer's agency approach (Fryer, 1997; Fryer & Payne, 1984) were frequently cited but empirical evidence in favor of these models is not as abundant as one might expect for such renowned theories (e.g. Creed & Reynolds, 2001; Fryer & McKenna, 1984; Jeurissen & Nyklicek, 2001). To develop and test new theories might also be a promising agenda for future research aspirations. Paul and Moser (2006), for example, proposed the incongruence hypothesis of unemployment distress that is not based on the fact that unemployed people do not work, as Jahoda's (1981, 1982) and Warr's (1987) theories are, but on the desire for work that is prototypical for unemployed persons (note that all accepted definitions of unemployment include a "search for work"-criterion). In contrast to employed persons, unemployed persons find themselves in a situation of incongruence between their values (high commitment to work) and the reality (no work). This incongruence between values and life goals on the one hand and the reality on the other hand is hypothesized to be one of the reasons for the distress unemployed persons experience. Paul and Moser (2006) also meta-analysed empirical evidence endorsing this hypothesis. But additional empirical evidence concerning this hypothesis certainly is needed.

Furthermore, some important and interesting groups in the labor market have not yet received the attention they deserve. Additional primary studies that examine these special groups could be very valuable. Minority members and very-long-term-unemployed persons have already be mentioned. There are also only few studies that are especially concerned with the problems unemployed parents face, though these problems may be serious, particularly for impoverished single mothers and for men who stick to their traditional role as a family provider. Studies with older unemployed workers are also rare, although most industrialized societies experience demographic changes that will lead to a higher proportion of elder persons in the labor market in the near future. It has already been mentioned that there is also a lack of studies from non-Western countries, limiting the generalizability of the results presented here.

8.4. Political and societal implications

The results of the present study show that unemployment is a serious threat to mental health. Therapists and other members of the health care system may be inspired by these results to reconsider their therapeutic strategies for persons without a job. Unemployment can cause mental health problems and should not be underestimated in comparison to other potentially pathogenic factors (e.g. problematic intimate relationships). Sometimes it may even be good advice to incorporate elements of outplacement counseling into the treatment of health care clients who are also unemployed. It is hopeful result that psychological interventions for unemployed people were found to have positive effects on mental health in the present meta-analysis.

Although the picture for most of the moderator effects found here is not yet complete (see last section), some tentative conclusions are possible: Male blue-collar workers are probably more vulnerable to the negative mental health effects of unemployment than other social groups. Thus, they should not be neglected when public resources are allocated in order to help unemployed people. Furthermore, the goal of any intervention must be to end a period of unemployment as fast as possible, because the risk for mental health problems continuously rises throughout the first nine months of unemployment and recedes only partially afterwards.

It is also an important result that unemployment has comparatively weak malignant effects in economically highly developed countries and in countries with an egalitarian income structure (where the level of unemployment protection usually is high). Countries like Canada or Sweden demonstrate that it is possible to achieve both goals simultaneously, high development as well as income equality.

In sum, a large number of unemployment researchers sacrificed immense amounts of strength, passion, diligence, creativity, and lifetime in order to demonstrate the devastating psychological effects of unemployment. The result is a clear and unequivocal warning that unemployment is a severe risk for public mental health that must be fought with all possible means.

Appendix A. Supplementary data

The references for those primary studies that provided data for the meta-analysis but are not directly mentioned in the text can be found, in the online version, at doi:10.1016/j.jvb.2009.01.001.

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