

# The effects of non-standard employment on subjective well-being: A meta-analytic review

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## Abstract

The aim of this review was to address the inconsistency in previous research, on the effect of non-standard employments on subjective well-being, with the use of meta-analysis. This was done by examining the standardised mean difference in global subjective well-being, or whole life well-being, between employees in non-standard employment and permanent employment. The scientific databases Web of Science, Scopus and EBSCOhost were systematically searched for studies on the connection between non-standard employment and subjective well-being. From the initial 1307 results of the systematic literature search, we identified 33 relevant primary studies published since 2004 in a variety of countries throughout the world. Meta-analytic results from a total of 55 independent effect sizes ( $N = 476\,454$ ) suggest that employees in non-standard employment experience lower global subjective well-being ( $d = -0.05$ ) compared to employees in permanent employment. Moderator analyses indicate that if primary studies control for subjective job insecurity or employability, it will remove the statistically significant effect of global subjective wellbeing between employees in non-standard employment and permanent, resulting in  $d = -0.05$  to  $d = 0.01$  and  $d = 0.01$ , respectively. We can therefore conclude that non-standard employments do have a statistical significant small negative effect on global subjective well-being. However, evidence suggest that the negative effect is more due to the subjective perception of job insecurity and employability rather than the objective condition of non-standard employment.

**Keywords:** non-standard employment, subjective well-being, meta-analysis, precarious employment, contingent work

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## 1. Introduction

In decades, we have seen an increasing use of different non-standard employment arrangements that depart from the traditional full-time permanent employment. This is a result of growing structural unemployment during the 1980s, to which extensive labour

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market reforms were undertaken throughout Europe and most parts of the developed world in efforts to increase the flexibility of working arrangements (Connelly & Gallagher, 2004; Lepak et al., 2003) as organisations seek to respond to the changing globalised market conditions (Forde et al., 2008). According to The International Labour Organisation, there is strong evidence that this trend of growing non-standard employments will, not only, persist but also intensify and diversify in the future (International Labor Office, 2016).

As result of changing employment arrangements and the trend of growing non-standard employment arrangements, researchers have raised concerns about how non-standard employments affect the well-being of employees. Evidence shows that non-standard employees are worse off than permanent colleagues in terms of wages, working conditions, career development prospects (Booth et al., 2002; Eurofound, 2015; Gash, 2008; Kompier et al., 2009) and generally experience higher job insecurity (Cappelli & Keller, 2013; De Cuyper et al., 2019; Wagenaar et al., 2013). However, when it comes to the effects on well-being, the issue is more complex and the evidence less clear. While some studies confirm lower well-being of temporary employees relative to permanent employees (Carrieri et al., 2014; Gundert & Hohendanner, 2014; Mochón Morcillo et al., 2012), other studies find no differences between the two groups or even find the opposite results (Dawson et al., 2017; De Cuyper & De Witte, 2007; van den Tooren & de Jong, 2014).

The goal of this study is to address the inconsistency in previous research on the effects of non-standard employment on subjective well-being, with the use of meta-analysis. The meta-analysis method allows us to synthesise data from multiple studies in order to find patterns in results of the studies. Two narrative reviews by Imhof and Andresen (2018) and De Cuyper and De Witte (2008) and De Cuyper et al. (2008) have already provided several advances on this topic through meticulous categorisation of theoretical, methodological and operationalisation approaches in previous research on the topic. Their recommendations for further investigations provides valuable insight into potential and moderator analyses, namely on the heterogeneity of non-standard employments, the loose and undisciplined use of the word *well-being* in previous studies and the lack of theoretically founded explanatory variable. A meta-analysis may test whether there is evidence of systematic and substantive difference (Schmidt & Hunter, 2015) in well-being between permanent and non-standard employees. Additionally, a meta-analysis may test whether there is a difference in the results of studies with the mentioned characteristics. As such, this meta-analysis will do the following: (i) quantitatively summarize the mean difference in well-being between permanent and non-standard employees, and (ii) identify potential reasons for the dispersion of empirical results through moderator analyses. The meta-analysis will advance the study of non-standard employees in two ways. First, a quantitative summary is especially important for clarifying whether or not the social condition of being in a non-standard employment has an effect on well-being or not. Second, by clarifying the reasons for the previous inconsistent research findings, we contribute to further theoretical development on the topic.

## 2. Background information

### 2.1. Subjective well-being

The amount of research on the well-being of non-standard employees has continuously increased over the last few years. After familiarising ourselves with the literature and previous reviews on the topic (De Cuyper & De Witte, 2008; De Cuyper et al., 2008; Imhof & Andresen, 2018; Virtanen et al., 2005), it became apparent that a great number of different indicators and constructs are subsumed under the name of well-being. Most common

indicators encompassed under well-being include general health status, mental health, life satisfaction and job satisfaction (De Cuyper & De Witte, 2008; De Cuyper et al., 2008; Imhof & Andresen, 2018; Virtanen et al., 2005). The inconsistent results in previous research on the effect of non-standard employment on well-being could very well be caused by the multiple uses of well-being (definitions) and its operationalisations in previous research. Moreover, while previous meta-analyses on the topic have investigated job insecurity on mental health (Llosa et al., 2018), temporary employment on health (Virtanen et al., 2005), contingent workers and job satisfaction (Wilkin, 2013), none have investigated non-standard employment on subjective well-being. For these reasons, this meta-analysis will focus on, and be limited to, the effect of non-standard employment on global subjective well-being. This approach emphasises the subjective nature of the well-being that individuals experience and their own assessments thereof. Additionally, the choice to focus on a global, or whole life well-being, is that non-standard employment does not just affect one life domain, such as work, but likely has spill over effects to other parts of life, such as work life balance, family life, or one's position in society (Kalleberg, 2009). With that, it may well be that the entirety of life is affected by such employment. Following the definition of Diener (1994), we define (global) subjective well-being as an individual's own assessment of their happiness and satisfaction with life as a whole. This short definition encompasses both affective well-being and evaluative well-being (Organisation for Economic Co-operation and Development, 2013) but excludes alternative measurements of well-being, such as general health or domain specific well-being (job satisfaction).

## 2.2. Non-standard employment

Internationally, studies on the growth of non-standard employment relations, and its effect on individual and organisations, are marked by different vocabulary and definitions. In terms of vocabulary, *contingent employment* is most prevalent in US and Canadian literature (Polivka & Nardone, 1989), *temporary and fixed-term employment* is most used in European literature (Connelly & Gallagher, 2004; De Cuyper & De Witte, 2008; De Cuyper et al., 2008) and *casual employment* is the closest equivalent in Australia and New Zealand (Campbell, 2004). For reasons of consistency, we will use the term non-standard employment as an umbrella term that encompasses work that falls outside the realm of the "standard employment relations" (Kalleberg, 2000).

While mentioned differentiated vocabulary and definitions for non-standard employments encompass several distinct employment arrangements, an underlying commonality is that they depart from the traditional or standard employment relations (Campbell, 2004; Connelly & Gallagher, 2004; Gallagher & Parks, 2001; Kalleberg, 2000; Polivka & Nardone, 1989). Standard employment relation is what became the norm for salaried work, following the industrial revolution and as a result of the growing influence of collective bargaining and legislation (International Labor Office, 2016). The typical standard employment relation is characterised by: (i) permanency and continuity of employment; (ii) employment under the supervision of employer; and that (iii) the employment is associated with certain benefits and entitlements such as minimum wage, unemployment insurance and protection against unfair dismissal (Kalleberg, 2000). In contrast, non-standard employments often include a fixed termination date, can be market mediated by a third party and are not entitled to benefits and protections. Non-standard employment can therefore be defined as employment of limited duration or employment in which minimum working hours can vary in a non-systematic manner.

In this meta-analysis, we seek to control for the heterogeneity of non-standard employ-

ments. Following the employment relations argument, there are three kinds of non-standard employments: (i) direct hire temporaries, which are hired directly by the organisation to fulfil short-term or variable scheduling needs of the organisation itself (e.g. fixed-term employments, project work, casual work, on-call work); (ii) agency employment, which involve explicit short-term contracts mediated through a third-party agency or recruiting organisation to fulfil the needs of client organisations; and (iii) independent contractors, who are self-employed workers that sell their services to clients on a fixed term basis, and thus have their own worker client relationship (Gallagher & Sverke, 2005). Direct hire temporaries can be further classified into *fixed-term employees* and *casual employees*, following the employment relations argument, where the working hours and schedule of casual employees may vary in a non-systematic manner. Part-time work is sometimes included as a non-standard employment (International Labor Office, 2016). However, since most part-time working arrangements are based on ongoing mutually beneficial relationships, such work can be considered a stable and systematic work arrangement (Gallagher & Sverke, 2005; Polivka & Nardone, 1989). Although the above groupings are made with respects to certain shared characteristics among non-standard employments, the employment differ in respects to particular national contexts, institutional settings and legislations (Olsen & Kalleberg, 2004). Evidence suggests that the different non-standard employments are a widely heterogeneous group, which is also evident in their effects on well-being (De Cuyper & De Witte, 2008; De Cuyper et al., 2008; Imhof & Andresen, 2018).

### 2.3. Theory and antecedents

A wide variety of theories has been used in previous research to investigate the effects of non-standard employments on well-being (De Cuyper & De Witte, 2008; De Cuyper et al., 2008; De Witte et al., 2016). The most popular can be divided into two groups: (i) (Work) Stress theories and (ii) Social Comparison & Exchange theories.

Work stress theories typically start with some variation of labour market theories, such as Flexible Firm (Atkinson, 1984) or the Human Capital theory (Becker, 1993), to suggest that non-standard workers are considered peripheral workers in whom the employer is unlikely to invest. This fosters poor job characteristics most notably in self-experienced job insecurity, low wages, reduced autonomy and limited support from employer, which in turn will be appraised as stressful and reacted to by the employee, in accordance with Appraisal Theory (Lazarus, 1999) and Conservation of Resources (Hobfoll, 1989). These job stressors are thought to ultimately result in lower well-being for the non-standard employee. Identified relevant studies that can be included under work stress theories, include (Bardasi & Francesconi, 2004; Bernhard-Oettel et al., 2008; Dawson et al., 2017; De Cuyper et al., 2009; de Jong, 2014; Fontinha et al., 2018; Gracia et al., 2011; Green & Heywood, 2011; Green & Leeves, 2013; Klug, 2020; Lee & Baek, 2018; Silla et al., 2005, 2009).

Social comparison and social exchange theories explain how well-being is the result of social comparisons and evaluations of fairness. These theories suggest that individuals make social comparisons with other who are proximate (Kruglanski & Mayseless, 1990; Kulik & Ambrose, 1992). In the case of non-standard employees, permanent employees are argued to be the referent other from which they compare outcomes. Since non-standard employees typically receive inferior rewards for their work efforts relative to permanent employees—in addition to the insecurity of not being in a permanent job—the non-standard employees may experience a sense of deprivation. In turn, this generates lower well-being for the non-standard employees. Identified relevant studies, that can be included under social comparison theories or social exchange theories include (De Cuyper & De Witte,

2006, 2007; De Cuyper et al., 2011, 2019; Fontinha et al., 2018; Gundert & Hohendanner, 2014; Helbling & Kanji, 2018).

Both groups of theories suggest that non-standard employment will suffer lower well-being compared to permanent employees due to inferior reward for work. Following the assumptions presented in these theories, a similar approach has been adopted in this meta-analysis where the well-being of non-standard employees will be compared to the well-being of permanent employees. The primary antecedent in most research on the topic, and across both groups of theories, is therefore employment status as indicated by the employment contract.

Although both groups of theories emphasise the resources awarded for work, the mechanisms of why it influences well-being differ. In Work Stress Theories, it is the lack of resources that cause lower well-being, whereas in Social Comparison and Exchange theories it is the unfair distribution of resources in relation to the referent “other” that causes lower well-being. However, there does not seem to be any systematic difference in the antecedents used in the articles that use Stress theories and the articles that use Social Comparison & Exchange theories. Both groups of theories apply a narrative of a changed labour market that is more flexible, and where insecurity simply is a condition of being an employee. Consequently, the articles focus on insecurity. In extension of this, the other antecedent that is consistently used in articles on this topic is subjective job insecurity i.e. the fear of losing one’s job. Articles of both groups of theories consistently use subjective *job insecurity* as indicator of either work stress and/or socially comparable unfair treatment (Dawson et al., 2017; De Cuyper & De Witte, 2006, 2007; De Cuyper et al., 2019; Silla et al., 2009). We therefore have both objective job insecurity as indicated by employment contract, and subjective job insecurity. Some studies also use employability as buffers against the stressor of poor job characteristics (De Cuyper et al., 2019; Gracia et al., 2011; Silla et al., 2005, 2009). Employability has been suggested to be the new form of labour market security in the age of flexible employments where employers can no longer guarantee employment for life (Bernstrøm et al., 2019). In this meta-analysis, we use moderator analyses to control for the above-mentioned antecedents that have been used consistently throughout the included articles.

### 3. Method

#### 3.1. Search strategy

To identify all relevant studies, systematic literature searches were conducted in scholarly databases. The databases chosen for the search are Web of Science, Scopus and EBSCOhost, which were chosen for their extensive coverage. Together they cover more than 40 other databases and publishing houses, including Social Science Citation Index, MEDLINE and PsycArticles. The following keywords were used in the search: “(subjective) well-being”, “satisfaction with life”, “(whole) life satisfaction”, “quality of life or happiness”, and “precarious”, “insecure”, “contingent”, “temporary”, “fixed-term”, “casual”, “agency”, “atypical” or “non-standard”. The only condition applied in the search strategy is the link between global subjective well-being related search terms and non-standard employment related search terms, indicated by Boolean operator AND. Between synonyms of the concepts we used Boolean operator OR. The main search strategy was complemented with individual searches in selected journals relevant to the topics of well-being and/or organisational behaviour (e.g. Social Indicators Research). Additionally, we manually searched reference lists of retrieved relevant articles, books and reviews for any additional relevant studies. This process of



cross-referencing was continued until no new references could be identified. The systematic literature searches were performed in June 2019 and again in January 2021.

For the purpose of performing a meta-analysis, only quantitative peer-reviewed primary studies were included in the analysis. No language or publication year limitations were specified in the search, since the intention was to identify as many relevant studies as possible. To include all identified relevant articles, we contacted authors<sup>1</sup> of primary studies to provide additional data (e.g., means, standard deviations) that were omitted from the articles.

### 3.2. *Criteria for inclusion*

Several criteria decided whether studies were included in the meta-analysis. First, studies needed to report a standardised mean difference in global subjective well-being between non-standard employees and permanent employees. Studies that present outcomes in different effect sizes (e.g., means for both non-standard and permanent employees) were also included in the meta-analysis if the standardised mean difference could be calculated. The global subjective well-being measure could be affective and/or evaluative, and was accepted as single- and multi item indicator.

Second, studies needed to explore at least one type of non-standard employment, in accordance with previously established definition. We have chosen to exclude studies that focus on part-time employment compared to fulltime employment, because of the problematic overlapping of part-time and permanent employment. Thereby we limit the focus of this meta-analytic review to the absence of permanency in employment. We also excluded studies that focus on contractors/self-employed compared to standard employment for various reasons regarding the choice to stand out from the standardised employment structure. Even though self-employed may suffer from much of the same labour market- and income insecurity as other non-standard employed, self-employed typically have greater autonomy over their own labour and are regulated differently by laws (International Labor Office, 2016).

Third, samples in the original studies needed to present a general healthy working population. The focus of this study is specifically on the research problem of whether non-standard employment has an adverse effect of the well-being of employees. This means that studies that focus on the life satisfaction of working cancer patients, well-being of disabled in workplace etc. were excluded from the analysis.

Fourth, since part of the goal of this study is to get as close to the true mean score as possible, the meta-analysis only includes studies that perform and report results of multivariate analyses. Descriptive analyses such as simple zero-order correlations do not control for possible moderators and therefore present too simple a relationship between non-standard employment and global subjective well-being.

### 3.3. *Study identification*

The study identification process was supported by a pre-established review protocol aimed at systemising the review process for the involved researchers and reviewers. The purpose of a pre-established review protocol is to ensure transparency and reproducibility, in addition to minimizing bias in conduct and reporting, of the review. The review protocol is published on the international prospective register of systematic reviews (PROSPERO) (Fabrin-Petersen et al., 2019).

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<sup>1</sup>We thank researcher Katharina Klug for sending additional statistical data for effect size calculations.

Screening and the eligibility assessments were done with the assistance of two additional researchers in order to minimise any reviewer biases, and to ensure that we identify all studies that are relevant to this meta-analysis. The screening and eligibility assessments were done independently by each researcher, while differences in assessments—one reviewer having included a study while others did not—were resolved through discussion. All differences in assessments were resolved through re-examination of study following unanimous decision.

#### 3.4. Meta-analytic calculations

Hedges and Olkin (1985) meta-analytic approach was employed to estimate the effect sizes of categorical variables in the analysis of the difference in global subjective well-being between employees in non-standard employments and employees in permanent employment. Hedges and Olkin (1985) proposed a meta-analytic approach to determine the magnitude of the relationship a predictor  $X$  and a criterion  $Y$ , using Cohen's  $d$  or Hedges'  $g$ . Cohen's

$$d = \frac{M_1 - M_2}{SD_{\text{pooled}}}$$

is calculated by subtracting the mean of one group from the other ( $M_1 - M_2$ ) and divide the result by the standard deviation of the population sample (Cohen, 1988). The summary effect size estimate is computed as a weighted mean of the study means:

$$\overline{ES} = \frac{\sum_{i=1}^k w_i ES_i}{\sum_{i=1}^k w_i},$$

where the sum of the study effect size multiplied by the weight ( $w_i ES_i$ ) is divided by the sum of the weights ( $w_i$ ) for the studies  $i, \dots, k$  (Borenstein, 2009; Borenstein et al., 2009). The degree of variability of the effect size estimates across studies is assessed with the homogeneity statistic  $Q$ . A statistically significant  $Q$  suggest that the primary level effect size estimates do not estimate a common population effect size, which warrants a search for moderating effects (Aguinis et al., 2008).

For this meta-analysis, we used the standardised mean difference (Cohen's  $d$ ), with a confidence interval (CI) at 95 %, as the effect size measure. The reason for this choice is that the vast majority of the studies reported some variety of a mean in global subjective well-being. Another argument for using mean as effect size is that it is an intuitive indicator whose meaning resonates with a common sense understanding of the research problem. Since not all included studies use the same scale of outcome, a standardised mean is preferred over raw means for comparability (Cohen, 1988). Outcomes that were not reported in standardised mean difference—e.g. raw means of individual (independent) groups—were calculated or converted to standardised mean difference using formulas presented by Borenstein (2009) and Borenstein et al. (2009).

Regarding the central aspect of statistical inference, we used the random effects model, also called unconditional inference model, for the effect estimates. The inference model is chosen from the universe we want to make inference about. In this case it was a universe of populations (random effects model), rather than one population (fixed effect model). This implies that the populations in the included studies were not identical, that the procedures in the individual studies were not the same and the effect sizes were not the same (Borenstein et al., 2010). Consequently, we are not dealing with one true score, but many true scores of the effect of non-standard employment on global subjective well-being. In practice, this

means adjusting the weight that each individual study can have, so that a single study cannot skew the results.

The software used for the analysis is Comprehensive Meta-Analysis (CMA), developed by prominent researchers on the meta-analysis method (Borenstein et al., 2014). The CMA software combines powerful analytical tools in an intuitive platform, which is why it was chosen for this analysis.

### 3.5. Main- and moderator analyses

To identify the mean difference in global subjective well-being between employees in non-standard employments and employees in permanent employment, we conducted one main analysis in which we combined the different non-standard employment indicators into one category (comparing them to permanent employment) and combined the global subjective well-being indicators into one outcome. The characteristic of non-standard employment is therefore considered the interventions variable or main explanatory variable. The result of the main analysis is afterwards utilised as a basis for identifying the reason for why the results of previous research have been inconsistent and contrasting. In order to identify reasons for previous inconsistent research results, we used moderator analyses to test for variations (heterogeneity) among results. We used the  $Q$  statistic to test for heterogeneity in the effect sizes across the included studies. When the  $Q$  statistic showed heterogeneity, we ran moderator analyses on different operationalisation, population and theoretical distinctions in the included studies. Schmidt and Hunter (2015) approach of dividing primary studies into subsets and rerun  $Q$  statistic test was chosen for the method of moderator analysis.

First, moderator analyses were conducted for the different well-being concepts and operationalisations. In the moderator analysis of different well-being concepts, we divide the studies into subsamples of those that use an evaluative well-being indicator (evaluations of life or satisfaction with life) and those that use an affective well-being indicator (experience or absence of happiness). Since the concepts are slightly different from each other in philosophical foundation (Organisation for Economic Co-operation and Development, 2013), the respondent may associate different meanings to the concepts e.g. the question of how often they experience happiness versus how satisfied they are with life in general. A moderator analysis will show if there is a significant difference in evaluations between the concepts. Additionally, a moderator analysis was conducted for single- and multi-item well-being indicators. Since a composite measure is meant to be a better indicator of the latent phenomenon than a single item measure (DeVellis, 2012), it is clear that this better indicator must also be different in its effects. Although both single-item global well-being indicators and multi-item well-being indicators are empirically reliable and valid measures, we test if there is a significant difference between the measures.

Second, a moderator analysis was conducted for the different types of non-standard employment, by dividing non-standard employees into subgroups of *fixed-term employees*, *casual employees* and *agency temps*. This moderator analysis is motivated by previous research, which suggests that non-standard employments are a heterogeneous group and qualitatively different from each other in terms of working conditions and employer/employee relations (Gallagher & Parks, 2001; Wagenaar et al., 2013). Research results indicate that there is already a difference in outcomes of health and job satisfaction among the different types of non-standard employments (Kompier et al., 2009; Wilkin, 2013). A moderator analysis will test whether these differences are reflected in the global subjective well-being.

Third, moderator analyses were conducted for the consistently used antecedents. A



moderator analysis was conducted for the presence of *job insecurity* in the explanatory models of the original studies, consistent with both Work Stress theories and Social Comparison theories. This moderator will reveal if, or how much, the subjective job insecurity takes away from the effect of non-standard employment (objective job insecurity) on global subjective well-being. We also conducted a moderator analysis for subjective employability, which is believed to work as a buffer against the work stressors associated with non-standard employment.

We also conducted a variety of sensitivity analyses to test for different contextual characteristics associated with the study samples—representative sample, population subgroup sample. In addition, we test for original study outcome and data source to test whether the chosen analyses or data sources have significant influence on the observed effect.

Lastly, we conducted a publication bias analysis to test for bias like the “file drawer” problem, where studies are conducted but not published (Duval & Tweedie, 2000). To test for this we used the funnel plot as exploratory tool to detect the presence of publication bias and assess its impact on the analysis.

## 4. Results

### 4.1. Identified studies

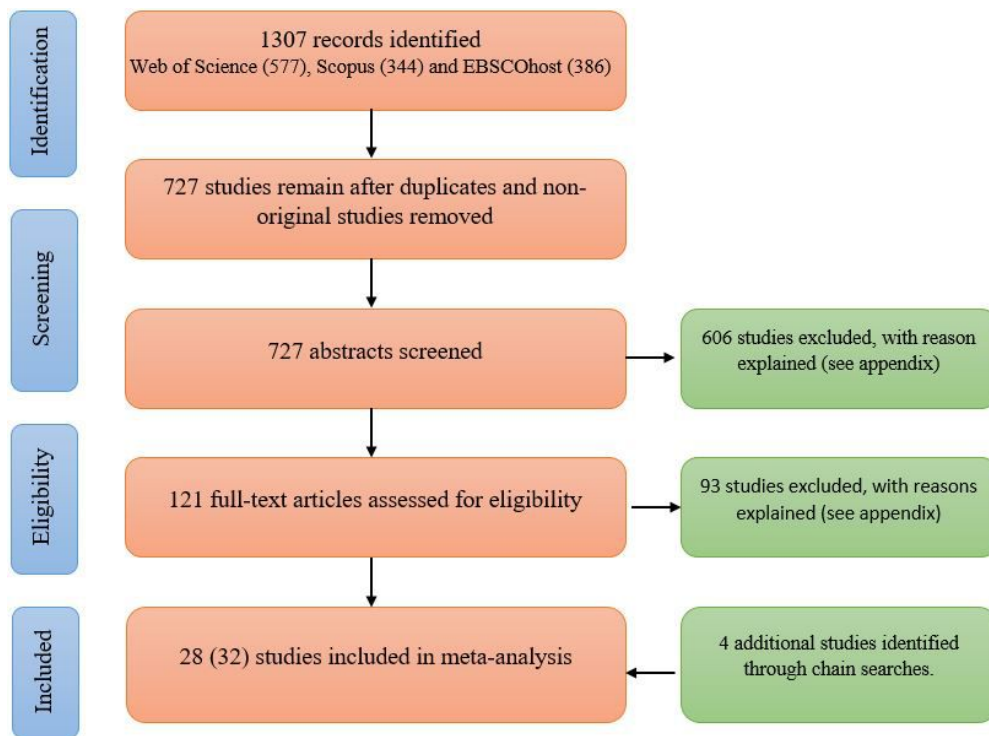
In accordance with previously established inclusion and exclusion criteria, the systematic literature search identified 32 relevant studies that investigate the difference in global subjective well-being between employees in non-standard employments and permanent employment. Out of these studies, four new studies were identified through reference list chain searches. To visualize the study identification process, we utilize the resources from the PRISMA reporting standards, namely the PRISMA flow diagram (Page et al., 2021). Figure 1 below presents the diagram, which highlights the key stages of the study identification process:

The systematic literature searches identified 1307 potentially relevant studies from the three databases. Once duplicates and non-original studies had been removed, 727 potentially relevant unique studies remained to be analysed. We each screened the 727 remaining studies for relevance according to pre-established inclusion and exclusion criteria. At this stage, we only excluded studies if the title and abstract examination enabled us to determine beyond any doubt that the study was not eligible to be included in the meta-analysis. In this screening process, we excluded a total of 606 studies, which left 121 studies for further evaluation. We retrieved the full-text contents of the remaining 121 studies and assessed the eligibility according to established inclusion and exclusion criteria. We concluded that 28 studies were eligible to be included in the meta-analysis. A 29th study (Burnay et al., 2005) was identified as relevant to the meta-analysis, but was eventually excluded as we were unable to obtain the necessary data to calculate (or estimate) the standardised mean difference. An additional four relevant studies we identified through reference list chain searches of either included studies or topic related reviews.

### 4.2. Study characteristics

The identified eligible studies are summarised in Table 1, along with their study characteristics. The 32 eligible studies provided 55 independent effect sizes, with 476 454 person observations included in the analysis.

Although there were no language or publication year limitations in the literature search, the resulting studies were all published from 2004 to 2021, with the majority coming from



**Figure 1:** PRISMA flowchart for identification of relevant studies

Europe (80 %). One reason for this could be the focus on non-standard employments, which has occasionally received criticism for being too Eurocentric, as standardised employment only became the norm in post-industrial countries. Consequently, we mostly see rich and western countries focus on this issue. Another reason could be if studies do not make a distinction between standard and non-standard employment in their analyses, in favour of more elaborate precarity typologies (Blustein et al., 2020), which may explain why there are no studies from the US and Canada. Additionally, we see an over representation of some countries, which is due to the research focus of a few dedicated researchers.

**Table 1:** Study characteristics of identified relevant studies

ID	Study
1	Mochón Morcillo et al. (2012) • <i>Sample and location:</i> population subsample, Spain • <i>Study design and year:</i> pooled cross-sectional, 2002–2006 • <i>Sample size:</i> 4972 • <i>Sample characteristics:</i> 15–29 years olds, mean age of 22 years, 49 % female • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> life satisfaction, single item • <i>Type of non-standard employment:</i> temporary employments, other non-standard employees
2	Appau et al. (2020) • <i>Sample and location:</i> representative population sub-sample, United Kingdom • <i>Study design and year:</i> longitudinal, 2002–2016 • <i>Sample size:</i> 19 762 • <i>Sample characteristics:</i> over 50 years old, mean age of 64 years • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> evaluative well-being, multi item • <i>Type of non-standard employment:</i> fixed-term employment

*Continued on next page*

**Table 1:** Study characteristics of identified relevant studies (Continued)

ID	Study
3	Bardasi and Francesconi (2004) • <i>Sample and location:</i> panel data survey, United Kingdom • <i>Study design and year:</i> longitudinal and cross-sectional, 1991–2000 • <i>Sample size:</i> 32 464 • <i>Sample characteristics:</i> 16–60 years olds, 53 % female • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> life satisfaction, single item • <i>Type of non-standard employment:</i> temporary employment
4	Lee and Baek (2018) • <i>Sample and location:</i> stratified regional population sample, South Korea • <i>Study design and year:</i> cross-sectional, 2016 • <i>Sample size:</i> 8710 • <i>Sample characteristics:</i> mean age of 48 years, 13 % female • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> affective happiness, single item • <i>Type of non-standard employment:</i> fixed-term contract
5	Bernhard-Oettel et al. (2008) • <i>Sample and location:</i> employment sectors (manufacturing, education and retail), Sweden • <i>Study design and year:</i> cross-sectional, 2004 • <i>Sample size:</i> 648 • <i>Sample characteristics:</i> mean age of 37 years, 55 % female • <i>Antecedents considered:</i> employment contract, jobcontract preference • <i>Global subjective well-being measure:</i> life satisfaction, multi item • <i>Type of non-standard employment:</i> fixed-term employment, on-call employment
6	Carrieri et al. (2014) • <i>Sample and location:</i> population survey, subsample population, Italy • <i>Study design and year:</i> cross-sectional, 2004–2005 • <i>Sample size:</i> 8280 • <i>Sample characteristics:</i> 15–30 years olds, 43 % female • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> evaluative happiness, single item • <i>Type of non-standard employment:</i> fixed-term contract
7	Choi et al. (2020) • <i>Sample and location:</i> population sample, South Korea • <i>Study design and year:</i> cross-sectional, 2017 • <i>Sample size:</i> 4423 • <i>Sample characteristics:</i> over 15 years old, 47 % female • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> evaluative well-being, single item • <i>Type of non-standard employment:</i> fixed-term employment, casual/daily employment
8	Dawson et al. (2015) • <i>Sample and location:</i> panel data survey, United Kingdom • <i>Study design and year:</i> longitudinal and cross-sectional, 1991–2008 • <i>Sample size:</i> 60 058 • <i>Sample characteristics:</i> mean age of 38 years, 50 % female • <i>Antecedents considered:</i> employment contract, job insecurity • <i>Global subjective well-being measure:</i> life dissatisfaction • <i>Type of non-standard employment:</i> fixed-term contract, casual employment contract
9	de Jong (2014) • <i>Sample and location:</i> stratified multi-level sampling of organisations, five EU countries (Spain, Germany, Belgium, The Netherlands, and Sweden) • <i>Study design and year:</i> cross-sectional, unknown year • <i>Sample size:</i> 2598 • <i>Sample characteristics:</i> mean age of 36 years, 51 % female • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> life satisfaction, multi item ( $\alpha = 0.83$ ) • <i>Type of non-standard employment:</i> temporary contract

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**Table 1:** Study characteristics of identified relevant studies (Continued)

ID	Study
10	De Cuyper and De Witte (2006) • <i>Sample and location:</i> employment sectors (industry, service and government), Belgium • <i>Study design and year:</i> cross-sectional, 2002 • <i>Sample size:</i> 554 • <i>Sample characteristics:</i> mean age of 37 years, 60 % female • <i>Antecedents considered:</i> employment contract, job insecurity • <i>Global subjective well-being measure:</i> life satisfaction, multi item ( $\alpha = 0.83$ ) • <i>Type of non-standard employment:</i> temporary contract
11	De Cuyper and De Witte (2007) • <i>Sample and location:</i> employment sectors (industry, public enterprise and retail), Belgium • <i>Study design and year:</i> cross-sectional, 2004 • <i>Sample size:</i> 447 • <i>Sample characteristics:</i> mean age of 34 years, 63 % female • <i>Antecedents considered:</i> employment contract, job insecurity • <i>Global subjective well-being measure:</i> life satisfaction, multi item ( $\alpha = 0.86$ ) • <i>Type of non-standard employment:</i> fixed-term employment
12	De Cuyper and De Witte (2008) • <i>Sample and location:</i> employment sectors (industry, service and public organisations), Belgium • <i>Study design and year:</i> cross-sectional, 2005 • <i>Sample size:</i> 623 • <i>Sample characteristics:</i> mean age of 33 years, 51 % female • <i>Antecedents considered:</i> employment contract, volition/reasons • <i>Global subjective well-being measure:</i> life satisfaction, multi item ( $\alpha = 0.84$ ) • <i>Type of non-standard employment:</i> temporary contract
13	De Cuyper et al. (2009) • <i>Sample and location:</i> web based survey, Belgium • <i>Study design and year:</i> longitudinal, 2003–2005 • <i>Sample size:</i> 1343 • <i>Sample characteristics:</i> mean age of 36 years, 54 % female • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> life satisfaction, single item • <i>Type of non-standard employment:</i> (permanently on) temporary contract
14	De Cuyper et al. (2011) • <i>Sample and location:</i> employment sectors (industry and retail), Belgium • <i>Study design and year:</i> cross-sectional, 2004 • <i>Sample size:</i> 560 • <i>Sample characteristics:</i> mean age of 34 years, 65 % female • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> life satisfaction, multi item ( $\alpha = 0.87$ ) • <i>Type of non-standard employment:</i> temporary contract
15	De Cuyper et al. (2019) • <i>Sample and location:</i> continental Europe (Belgium, France Germany), mediterranean Europe (Greece, Portugal, Spain) • <i>Study design and year:</i> cross-sectional, 2010 • <i>Sample size:</i> 8506 (4933/3573) • <i>Sample characteristics:</i> mean age of 48/484 years, 51/46 % female • <i>Antecedents considered:</i> employment contract, job insecurity, employability • <i>Global subjective well-being measure:</i> life satisfaction, single item • <i>Type of non-standard employment:</i> temporary contract
16	Fontinha et al. (2018) • <i>Sample and location:</i> university employee surveys, United Kingdom • <i>Study design and year:</i> cross-sectional, 2011–2013 • <i>Sample size:</i> 510 • <i>Sample characteristics:</i> academics employees, 50 % women • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> general well-being, multi item ( $\alpha = 0.90$ ) • <i>Type of non-standard employment:</i> temporary contract

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**Table 1:** Study characteristics of identified relevant studies (Continued)

ID	Study
17	Gracia et al. (2011) • <i>Sample and location:</i> employment sectors (temporary help, retail and health care), Israel, EU countries (Belgium, Germany, Israel, the Netherlands, Sweden and the United Kingdom) • <i>Study design and year:</i> cross-sectional, 2004 • <i>Sample size:</i> 1287 • <i>Sample characteristics:</i> mean age of 36 years, 64 % female • <i>Antecedents considered:</i> employment contract, contract preference, employability • <i>Global subjective well-being measure:</i> life satisfaction, multi item ( $\alpha = 0.85$ ) • <i>Type of non-standard employment:</i> temporary employment
18	Green and Heywood (2011) • <i>Sample and location:</i> panel data surveys, United Kingdom • <i>Study design and year:</i> cross-sectional and longitudinal, 1999–2004 • <i>Sample size:</i> 39 138 • <i>Sample characteristics:</i> mean age of 39 years, 50 % female • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> life satisfaction, single item • <i>Type of non-standard employment:</i> fixed-term employment, agency temporary employment, other non-standard employment
19	Green and Leeves (2013) • <i>Sample and location:</i> panel data survey, Australia • <i>Study design and year:</i> longitudinal, 2001–2008 • <i>Sample size:</i> 17 621 • <i>Sample characteristics:</i> 15–64 years olds, all male • <i>Antecedents considered:</i> employment contract, job insecurity • <i>Global subjective well-being measure:</i> life satisfaction, single item • <i>Type of non-standard employment:</i> casual employment contract
20	Gundert and Hohendanner (2014) • <i>Sample and location:</i> panel data survey, Germany • <i>Study design and year:</i> longitudinal, 2007–2011 • <i>Sample size:</i> 16 240 • <i>Sample characteristics:</i> mean age 43 years, 50 % female • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> social well-being, single item • <i>Type of non-standard employment:</i> fixed-term employment, agency temporary employment
21	Helbling and Kanji (2018) • <i>Sample and location:</i> panel data, subsample, Germany • <i>Study design and year:</i> longitudinal, 2010–2014 • <i>Sample size:</i> 1874 • <i>Sample characteristics:</i> 27–30 year olds • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> life satisfaction, single item • <i>Type of non-standard employment:</i> fixed-term employment
22	Park and Kim (2020) • <i>Sample and location:</i> population sample, South Korea • <i>Study design and year:</i> cross-sectional, 2017 • <i>Sample size:</i> 37 059 • <i>Sample characteristics:</i> over 15 years old, 43 % female • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> affective well-being, multi item • <i>Type of non-standard employment:</i> fixed-term employment, casual/daily employment
23	Karabchuk and Soboleva (2020) • <i>Sample and location:</i> population samples, 27 European countries • <i>Study design and year:</i> pooled cross-sectional, 2004/2010 • <i>Sample size:</i> 34 699 • <i>Sample characteristics:</i> mean age of 41 years, 49 % female • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> happiness and life satisfaction, multi item • <i>Type of non-standard employment:</i> temporary employment, informal employment

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**Table 1:** Study characteristics of identified relevant studies (Continued)

ID	Study
24	Klug (2020) • <i>Sample and location:</i> panel data subsample, Germany • <i>Study design and year:</i> longitudinal, 2001–2014 • <i>Sample size:</i> 1521 • <i>Sample characteristics:</i> 18–30 years, 49 % women • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> life satisfaction, single item • <i>Type of non-standard employment:</i> temporary contract
25	Russo and Terraneo (2020) • <i>Sample and location:</i> population samples, United Kingdom, Ireland, Germany, France, Denmark, Sweden, Spain and Italy • <i>Study design and year:</i> pooled cross-sectional, 2012/2016 • <i>Sample size:</i> 10 234 • <i>Sample characteristics:</i> mean age of 43 years, 51 % female • <i>Antecedents considered:</i> employment contract, job insecurity, employability • <i>Global subjective well-being measure:</i> affective well-being, multi item • <i>Type of non-standard employment:</i> fixed-term contract
26	Scheuring (2020) • <i>Sample and location:</i> population samples, 23 European countries • <i>Study design and year:</i> cross-sectional • <i>Sample size:</i> 18 596 • <i>Sample properties:</i> mean of 44 years, 54 % female • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> evaluative well-being, single item • <i>Type of non-standard employment:</i> temporary employment
27	Schumann and Kuchinke (2020) • <i>Sample and location:</i> panel data, subsample, Germany • <i>Study design and year:</i> cross-sectional and longitudinal • <i>Sample size:</i> 10372 • <i>Sample properties:</i> 27–30 year olds • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> affective and evaluative well-being, multi item • <i>Type of non-standard employment:</i> temporary employment
28	Silla et al. (2005) • <i>Sample and location:</i> employment sectors (temporary help, retail and health care), Spain • <i>Study design and year:</i> cross-sectional, 2004 • <i>Sample size:</i> 382 • <i>Sample properties:</i> mean age of 32 years, 73 % female • <i>Antecedents considered:</i> employment contract, contract preference, employability • <i>Global subjective well-being measure:</i> evaluative well-being, multi item ( $\alpha = 0.78$ ) • <i>Type of non-standard employment:</i> temporary employment
29	Silla et al. (2009) • <i>Sample and location:</i> employment sectors (industry, temporary help and research & development), Belgium • <i>Study design and year:</i> cross-sectional • <i>Sample size:</i> 639 • <i>Sample properties:</i> mean age of 36 years, 62 % female • <i>Antecedents considered:</i> employment contract, job insecurity, employability • <i>Global subjective well-being measure:</i> evaluative well-being, multi item ( $\alpha = 0.84$ ) • <i>Type of non-standard employment:</i> Temporary contract
30	Vancea et al. (2019) • <i>Sample and location:</i> representative sub-population survey, Czech Republic, Denmark, Germany, Spain and United Kingdom • <i>Study design and year:</i> cross-sectional • <i>Sample size:</i> 5570 • <i>Sample properties:</i> 18–35 year olds, female: Czech Republic (40 %), Denmark (45 %), Germany (45 %), Spain (50 %) and UK(49 %) • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> evaluative well-being, single item • <i>Type of non-standard employment:</i> fixed-term contract

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**Table 1:** Study characteristics of identified relevant studies (Continued)

ID	Study
31	Voßemer et al. (2018) • <i>Sample and location:</i> population surveys, 26 European countries • <i>Study design and year:</i> pooled cross-sectional, 2002–2012 • <i>Sample size:</i> 76 703 • <i>Sample properties:</i> mean age of 41 years, 49 % female • <i>Antecedents considered:</i> employment contract • <i>Global subjective well-being measure:</i> evaluative well-being, single item • <i>Type of non-standard employment:</i> insecure job (fixed-term employment or no contract)
32	Wang and Raymo (2021) • <i>Sample and location:</i> population survey, Japan • <i>Study design and year:</i> longitudinal, 2005–2006/2008–2018 • <i>Sample size:</i> 20 750 • <i>Sample properties:</i> mean 45 years, 52 % female • <i>Antecedents considered:</i> employment contract, volition of employment • <i>Global subjective well-being measure:</i> affective and evaluative well-being, multi item • <i>Type of non-standard employment:</i> voluntary fixed-term, involuntary fixed term, other non-standard employment

### 4.3. Main effect

The results of the main effect indicate that the standardised mean difference in subjective well-being between employees in non-standard employments and employees in permanent employment, is  $d = -0.05$  with a 95 % CI  $[-0.07, -0.04]$ . This indicates that non-standard employees experience slightly lower global subjective well-being compared to permanent employees. The main effect is statistically significant but at a very small magnitude, according to Cohen (1988) and Sawilowsky (2009) rule(s) of thumb for effect sizes: *very small* (0.01), *small* (0.2), *medium* (0.5), *large* (0.8), *very large* (1.2) and *huge* (2.0). We can therefore conclude that there is a (very) small but statistically significant difference in global subjective well-being between employees in non-standard employments and employees in permanent employments. Table 2 displays an overview of all the individual effect sizes (Cohen's  $d$  and 95 % CI) included in the analysis, in addition to their relative weight contribution to the mean effect.

**Table 2:** Individual study effect sizes

ID	Subgroup	$N$	$n$	$d$ (SE)	95 % CI	$W$
1	Fixed-term	4972	2819	-0.11 (0.03)	$[-0.17, -0.05]$	2.66
1	Other non	4972	410	-0.09 (0.06)	$[-0.20, 0.02]$	1.43
2		19 762	810	-0.10 (0.04)	$[-0.18, -0.03]$	2.10
3 <sup>l</sup>	Men casual emp.	15 634	485	-0.09 (0.05)	$[-0.18, 0.00]$	1.78
3 <sup>l</sup>	Men fixed-term	15 634	485	-0.04 (0.05)	$[-0.13, 0.05]$	1.78
3 <sup>l</sup>	Women casual emp.	16 831	589	-0.09 (0.04)	$[-0.16, -0.02]$	2.35
3 <sup>l</sup>	Women fixed-term	16 831	842	-0.08 (0.04)	$[-0.17, 0.00]$	1.98
4 <sup>b</sup>		8710	2098	-0.13 (0.03)	$[-0.18, -0.08]$	3.04
5	Fixed-term	648	135	0.04 (0.10)	$[-0.15, 0.23]$	0.58
5	On-call emp.	648	45	-0.03 (0.16)	$[-0.34, 0.28]$	0.25

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**Table 2:** Individual study effect sizes (Continued)

ID	Subgroup	<i>N</i>	<i>n</i>	<i>d</i> ( <i>SE</i> )	95 % CI	<i>W</i>
6 <sup>b</sup>		8280	1840	-0.10 (0.03)	[-0.15, -0.04]	2.94
7 <sup>c</sup>	Casual/daily emp.	4423	550	-0.26 (0.05)	[-0.35, -0.17]	1.74
7 <sup>c</sup>	Fixed-term	4423	1460	-0.11 (0.03)	[-0.18, -0.05]	2.49
8 <sup>c,d</sup>	Casual emp.	60 058	1181	0.00 (0.03)	[-0.06, 0.05]	2.74
8 <sup>c,d</sup>	Fixed-term	60 058	1310	0.00 (0.03)	[-0.05, 0.06]	2.84
9		2598	1032	0.02 (0.04)	[-0.06, 0.10]	2.08
10 <sup>a,e</sup>		554	148	-0.07 (0.10)	[-0.25, 0.12]	0.60
11 <sup>a,e</sup>		447	142	0.20 (0.10)	[ 0.00, 0.40]	0.54
12 <sup>f,g</sup>		623	271	0.00 (0.08)	[-0.16, 0.16]	0.80
13 <sup>h,i</sup>		1343	90	-0.05 (0.11)	[-0.26, 0.17]	0.48
14 <sup>a,e</sup>		560	189	-0.18 (0.09)	[-0.35, 0.00]	0.68
15 <sup>j</sup>	Continental EU	4933	772	-0.05 (0.04)	[-0.12, 0.03]	2.13
15 <sup>j</sup>	Mediterranean EU	3573	825	0.03 (0.04)	[-0.05, 0.11]	2.10
16 <sup>b</sup>		510	255	0.20 (0.09)	[ 0.03, 0.38]	0.69
17 <sup>b</sup>	Fixed-term	1287	381	-0.06 (0.06)	[-0.17, 0.05]	1.44
18 <sup>c</sup>	Men Agency emp.	19 190	137	-0.05 (0.09)	[-0.21, 0.12]	0.73
18 <sup>c,d</sup>	Men Fixed-term	19 190	335	-0.01 (0.06)	[-0.11, 0.10]	1.42
18 <sup>c,d</sup>	Men Other non	19 190	150	-0.19 (0.08)	[-0.35, -0.03]	0.78
18 <sup>c,d</sup>	Women Agency emp.	19 948	161	-0.15 (0.08)	[-0.30, 0.01]	0.83
18 <sup>c,d</sup>	Women Fixed-term	19 948	521	-0.04 (0.04)	[-0.12, 0.05]	1.86
18 <sup>c,d</sup>	Women Other non	19 948	268	-0.13 (0.06)	[-0.25, -0.01]	1.22
19 <sup>c</sup>		17 621	2919	-0.03 (0.02)	[-0.07, 0.01]	3.39
20 <sup>c,k</sup>	Agency emp.	6888	756	-0.08 (0.04)	[-0.16, 0.00]	2.08
20 <sup>c,k</sup>	Fixed-term	6888	2539	-0.05 (0.03)	[-0.10, 0.00]	2.98
21 <sup>c</sup>		976	214	0.06 (0.08)	[-0.09, 0.22]	0.86
22 <sup>l</sup>	Men Casual/daily emp.	21 050	843	-0.08 (0.05)	[-0.18, 0.02]	1.59
22 <sup>l</sup>	Men fixed-term	21 050	1230	0.03 (0.04)	[-0.05, 0.12]	1.91
22 <sup>l</sup>	Women Casual/daily	16 009	254	-0.11 (0.09)	[-0.28, 0.07]	0.66
22 <sup>l</sup>	Women Fixed-term	16 009	1414	0.00 (0.04)	[-0.08, 0.08]	1.98
23 <sup>a</sup>	Fixed-term	34 699	4284	-0.05 (0.02)	[-0.09, -0.02]	3.67
23 <sup>a</sup>	Informal	34 699	2094	-0.04 (0.02)	[-0.09, 0.00]	3.22
24		1521	385	-0.07 (0.06)	[-0.19, 0.04]	1.30
25 <sup>c</sup>		10 234	1408	0.06 (0.03)	[ 0.00, 0.12]	2.79

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**Table 2:** Individual study effect sizes (Continued)

ID	Subgroup	<i>N</i>	<i>n</i>	<i>d</i> (SE)	95 % CI	<i>W</i>
26 <sup>a</sup>		18 596	2975	-0.08 (0.02)	[-0.12, -0.04]	3.41
27 <sup>c,k</sup>		10 372	3734	-0.01 (0.03)	[-0.05, 0.03]	3.38
28 <sup>b</sup>	Fixed-term	382	130	0.01 (0.10)	[-0.18, 0.20]	0.60
29 <sup>a,e</sup>		639	181	0.06 (0.09)	[-0.11, 0.23]	0.70
30		5570	1148	-0.10 (0.29)	[-0.68, 0.48]	0.07
31 <sup>c,d</sup>		76 703	13 075	-0.06 (0.01)	[-0.08, -0.05]	4.08
32	Men involuntary fixed-term	10 349	464	-0.12 (0.05)	[-0.21, -0.03]	1.72
32	Men other non-standard emp.	10 349	390	-0.12 (0.05)	[-0.22, -0.02]	1.55
32	Men voluntary fixed-term	10 349	192	-0.07 (0.07)	[-0.21, 0.08]	0.95
32	Women involuntary fixed-term	8993	2896	-0.10 (0.03)	[-0.15, -0.04]	2.99
32	Women other non-standard emp.	8993	937	-0.08 (0.04)	[-0.15, -0.01]	2.24
32	Women voluntary fixed-term	8993	2030	-0.02 (0.03)	[-0.08, 0.04]	2.80
Mean effect				-0.05 (0.01)	[-0.07, -0.04]	

<sup>a</sup> Cohen's *d* is calculated from raw difference in means, group sizes and *p*-value.

<sup>b</sup> *d* is calculated from independent group means, standard deviations and group sizes.

<sup>c</sup> *d* is calculated from raw difference in means standard error and group sizes.

<sup>d</sup> Effect size calculated as mean of fixed effect and pooled effect outcomes.

<sup>e</sup> *P*-value conservatively estimated according to star(s).

<sup>f</sup> *d* is calculated from independent group means, group sizes and *p*-value.

<sup>g</sup> *d* calculated from ANCOVA model.

<sup>h</sup> *d* is calculated from group pre/post means, standard deviations and group sizes.

<sup>i</sup> Treated group is the employees that remain in temporary employment.

<sup>j</sup> *d* is calculated as mean of two model outcomes with control variables (job insecurity and employability).

<sup>k</sup> *d* calculated as mean of RE between effect and RE within effect outcomes.

<sup>l</sup> *d* is calculated from odds ratio and confidence limits.

Notes: ID = study identifier, *N* = sample size, *n* = number of non-standard employees, *d* = Cohen's *d*, CI = confidence interval, SE = standard error, *W* = relative weight.

#### 4.4. Moderator analysis

After establishing the significance of the effect size, we calculated the *Q* statistic to test for heterogeneity in variance cross all the included studies. Since the test were statistically significant ( $Q = 122.64$ ,  $df = 54$ ,  $p < 0.001$ ), the main effect is heterogeneous. The observed heterogeneity is expected, as per the aim of this study to identify possible reasons for the inconsistent and contrasting research results, which means that there is good reason to commence moderator analyses. To test for moderators, we divided the data into subsets and analysed the difference in variance and mean effects between the subsets (Schmidt & Hunter, 2015).

##### 4.4.1. Evaluative and affective well-being

The first moderator analysis controls for the different types of global subjective well-being indicator. Specifically, we distinguish between affective well-being, evaluative well-

being and mixed well-being. The affective well-being is the positive and/or negative experiences of happiness; evaluative well-being is the evaluation and satisfactions with life; and mixed well-being is a combination of the two types. The results indicate that there is not a statistically significant difference between these types of well-being indicators. Even so, there does appear to be hierarchical ordering to the outcomes according to type; the affective well-being is least negative, evaluative well-being is most negative and mixed well-being is in between well-being. Table 3 shows a comparison of the subgroups. Studies that use affective well-being have a mean effect of  $-0.05$  with a 95 % CI  $[-0.10, 0.00]$ , while studies that use evaluative well-being have a mean effect of  $-0.05$  with a 95 % CI  $[-0.08, -0.02]$ . We can therefore conclude that the types of global subjective well-being does not have a significant influence on the effect of non-standard employment.

**Table 3:** Moderator analyses

Variable	<i>k</i>	<i>N</i>	<i>d</i> (SE)	95% CI
Main effect				
All studies	54	476 454	$-0.05$ (0.01)	$[-0.07, -0.04]$
Evaluative and affective well-being				
Affective well-being	9	80 526	$-0.05$ (0.03)	$[-0.10, 0.00]$
Mixed well-being	10	118 354	$-0.05$ (0.02)	$[-0.08, -0.02]$
Evaluative well-being	35	277 574	$-0.06$ (0.01)	$[-0.08, -0.04]$
Well-being indicator				
Multi item indicator	24	110 990	$-0.03$ (0.01)	$[-0.06, 0.00]$
Single item indicator	30	365 464	$-0.07$ (0.01)	$[-0.09, -0.05]$
Non-standard employment type (direct hire vs agency)				
Agency temps	3	46 026	$-0.09$ (0.03)	$[-0.15, -0.02]$
Casual/informal employment	11	197 453	$-0.10$ (0.02)	$[-0.14, -0.05]$
Fixed-term employment	12	218 197	$-0.05$ (0.01)	$[-0.07, -0.02]$
Job insecurity variable in original studies				
Job insecurity	10	99 035	$0.01$ (0.02)	$[-0.02, 0.04]$
Job insecurity not present	44	377 419	$-0.07$ (0.01)	$[-0.09, -0.05]$
Employability variable in original studies				
Employability	6	21 048	$0.01$ (0.02)	$[-0.04, 0.06]$
Employability not present	48	455 406	$-0.06$ (0.01)	$[-0.08, -0.05]$

Notes: *k* = subgroup size, *N* = sample size, *d* = Cohen's *d*, SE = standard error, CI = confidence interval.

#### 4.4.2. Multi and single item well-being

Second moderator analysis controls for the use of single- or multi-item well-being indicator in the included studies. The analysis shows that there is a statistically significant difference ( $p = 0.036$ ) in the effect sizes of the two sub-grouping. Table 3 shows a comparison between the subgroups. In studies that use multi item well-being indicator the mean effect is  $-0.03$  with 95 % CI  $[-0.06, 0.00]$ , while studies that use single item well-being indicator have a mean effect size of  $-0.07$  with a 95 % CI  $[-0.09, -0.05]$ . Therefore, studies that use a



multi-item well-being indicator generate a less negative effect of non-standard employments on global subjective well-being indicator, compared to those that use a single item, indicator.

#### 4.4.3. Type of non-standard employment

Third moderator analysis controls for moderation by the type of employment contract. We here distinguish between *fixed-term employees*, *casual employees* and *agency temps*. We did not include there studies that did not distinguish between the types of non-standard employments, as the inclusion of these would obscure the results of the moderator analysis. Table 3 shows the comparison between the sub-groupings. The mean effect of fixed-term employees were  $-0.05$  with a 95 % CI  $[-0.02, -0.07]$ , the means effect of casual employees were  $-0.10$  with a 95 % CI  $[-0.14, -0.05]$ , and the mean effect of agency temps were  $-0.09$  with a 95 % CI  $[-0.15, -0.02]$ . The sub-groupings are not statistically significantly different from each other due to the large variance in both sub-groups of causal employees and agency temps. However, in accordance with the argument for better employment relations, it does appear that fixed-term employees are slightly better off than casual employees and agency temps. All sub-groupings report a statistically significant difference negative effect of their respective non-standard employments compared to permanent employment.

#### 4.4.4. Antecedents

Moderator analyses were conducted for the antecedents that had consistently been used and controlled for in the original studies. A moderator analysis controls for the moderation of subjective job insecurity. If the original studies control for subjective job insecurity in their reported multivariate analyses, the negative effect of non-standard employment disappears and there is no longer a significant difference in global subjective well-being between non-standard and permanent employees ( $d = 0.01$ , 95 % CI  $[-0.02, 0.04]$ ). This could indicate that a large part of the negative effect of non-standard employments can be attributed to the subjective experience of job insecurity, rather than the objective position of non-standard employment.

Another antecedent that was used in several studies was the subjective experience of *employability*. A moderator analysis for the presence employability in the models of the original studies, shows that the negative effect of non-standard employments disappears, and that there is no longer significant difference on global subjective well-being between non-standard and permanent employees ( $d = 0.01$ , 95 % CI  $[-0.04, 0.06]$ ). This could indicate that the non-standard employees who feel employable and more marketable will enjoy higher subjective well-being, than the non-standard employees who do not feel employable.

#### 4.5. Sensitivity analyses

We conducted a variety of sensitivity analyses to control for certain methodological characteristics that may influence the outcomes of the analyses. Specifically, we control for outliers, original study outcome and original study data. Additionally, we perform ad-hoc analyses on the effects of different contextual characteristics associated with the sample population, which may also influence the outcome. Specifically, we test for representative sample and population sub-samples. These analyses are done in much of the same way as the moderator analyses, by dividing studies into subgroups of different characteristics.

We first conducted an analysis to see whether removing the outlier studies would affect the result of both main and moderator analyses. An outlier is defined by a study's effect size, where the individual effect is more than two standard residuals from the main effect mean (Harrer et al., 2021; Viechtbauer & Cheung, 2010). This identifies the studies

**Table 4:** Sensitivity analyses of population characteristics and artefacts

Variable	$k$	$N$	$d$ (SE)	95% CI
Main effect				
All studies	55	476 454	-0.05 (0.01)	[-0.07, 0.04]
Excluding outliers	50	464 713	-0.06 (0.01)	[-0.07, -0.04]
Same original data issue				
All studies	55	476 454	-0.05 (0.01)	[-0.07, -0.04]
All studies (nested studies subsumed)	37	476 454	-0.06 (0.01)	[-0.08, -0.04]
Original outcome type				
Group means, standard deviations	5	19 169	-0.05 (0.04)	[-0.01, 0.03]
Mean differences, $p$ -values	9	60 467	-0.06 (0.02)	[-0.09, -0.03]
Mean differences, standard errors	25	279 773	-0.06 (0.01)	[-0.08, -0.03]
Representative sample				
All studies	55	476 454	-0.05 (0.01)	[-0.07, -0.04]
Representative samples only	42	466 863	-0.06 (0.01)	[ 0.08, -0.05]
Population subsample				
30 years old or younger	6	31 068	-0.06 (0.03)	[-0.11, -0.01]
Over 30 years average	47	445 386	-0.05 (0.01)	[-0.07, -0.04]

Notes:  $k$  = subgroup size,  $N$  = sample size,  $d$  = Cohen's  $d$ , SE = standard error, CI = confidence interval.

whose confidence intervals do not overlap with the confidence interval of the main effect mean. Since such studies are statistically different from the main effect mean, they can indeed be considered outliers in the meta-analysis. The outliers are the study names: Lee and Baek (2018) ( $d = -0.13$ , 95 % CI [-0.18, -0.08]), Choi et al. (2020) – casual/daily ( $d = -0.26$ , 95 % CI [-0.35, -0.17]), De Cuyper and De Witte (2007) ( $d = 0.20$ , 95 % CI [0.00, 0.40]), Fontinha et al. (2018) ( $d = 0.20$ , 95 % CI [0.03, 0.38]) and Russo and Terraneo (2020) ( $d = 0.06$ , 95 % CI [0.00, 0.12]) (see Table 2). Table 4 shows a comparison of the main effect size with and without the outliers. From the analysis, it appears that the outliers have minimal impact on main effect both in terms of standardised difference in means, standard error and confidence interval. The same is true for the moderator analyses, where the outliers have very little influence on the result. However, it is worth noting that a lot of the unexplained variance<sup>2</sup> between the studies can be explained by the outliers, as the unexplained variance is estimated to 56 % with the outliers and 33 % without the outliers.

We then tested for what can be referred to as the *same original data issue*. The objective of this is to deal with the similarities and study level dependence that arise from using the same (public) data for multiple articles. As a rule, all effect sizes that are included in a meta-analysis must be statistically independent from each other in order not to compromise the results. When you include studies that use the same original public data for their analyses,

<sup>2</sup>Higgins (2003) suggest that unexplained variance up to 25 % is considered low, up to 50 % is considered moderate and up to 75 % is considered high. The Cochrane Handbook for Systematic Reviews (Higgins et al., 2019) suggest that heterogeneity under 40 % is considered low and may not be important.

you risk violating independence rule. However, since studies do not use the same sample (from years included), method of analysis, control variables or sub-groupings of respondent, it is difficult to ascertain if the independence rule has been violated. There are three ways to deal with this issue: (i) pick one of the nested studies and exclude the rest; (ii) weighted average for the studies; or (iii) sensitivity analysis (Shin, 2009). Since picking one study would result in a biased choice, and averaging across 12 studies would dramatically reduce nuances and possibility for moderator analyses, we opted for a sensitivity analysis. Table 4 presents a comparison of the main effect with all nested studies subsumed under one effect size. Specifically, it was the British Household Panel Data, the European Social Survey and the German Socio-Economic Panel that had been used for more than one study. The analyses indicated that there was minimal difference between the main effect with the nested studies subsumed and the main effect of the studies divided. Consequently, we decided to keep the studies individual, in order to allow for moderator analyses.

We also tested for outcome types of the original studies, which were subsequently converted or calculated into standardised mean difference. It appears that there is a slight, although not significant, difference between the different outcome types: group means, sample size ( $d = -0.08$  with 95 % CI  $[-0.13, -0.03]$ ), mean difference,  $p$ -value ( $d = -0.06$  with 95 % CI  $[-0.15, 0.03]$ ), mean difference, SE ( $d = -0.04$  with 95 % CI  $[-0.06, -0.02]$ ) and standardised mean difference ( $d = -0.01$  with 95 % CI  $[-0.06, 0.05]$ ). This may be explained by the small number of studies in some of the outcome type groups.

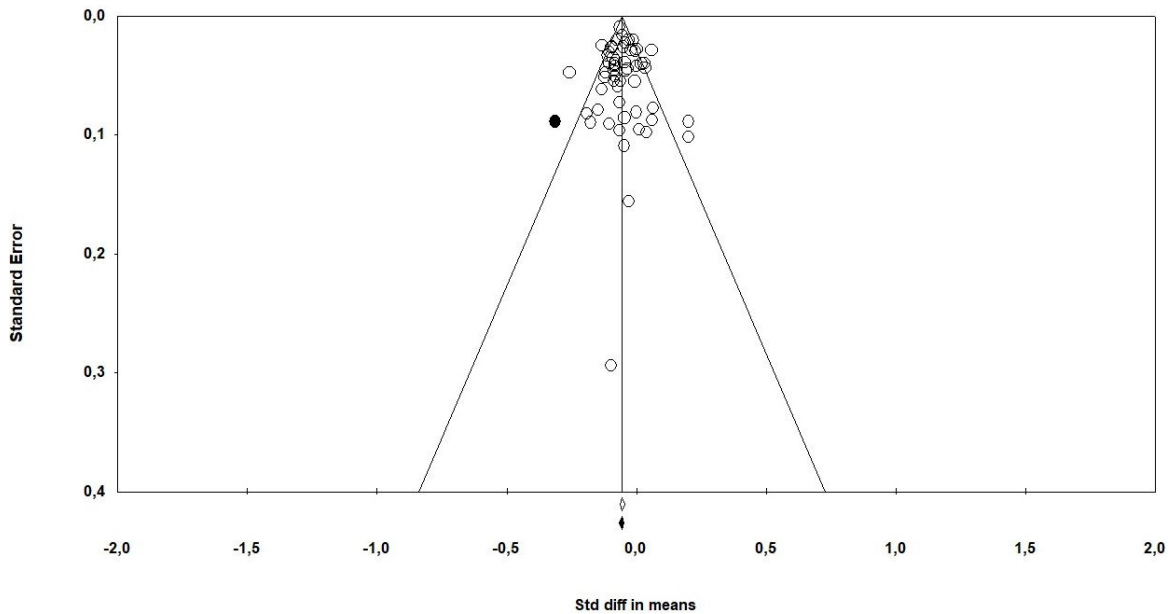
Another sensitivity analysis tested whether studies with non-representative samples had an influence on the outcome of the main effect. The presence of studies with non-representative samples do seem to have a minor influence on the main effect, from  $d = -0.05$  with non-representative samples to  $d = -0.06$  with representative samples only. Lastly, we looked at the difference of the main effect between studies that use subpopulations under 30 years old and studies with regular full age coverage samples. Although the variation is greater among the subgroup under 30 years of age, there is no statistically significant difference between the sub-groupings.

#### 4.6. Publication bias analysis

To account for publication bias like the “file drawer” problem, where studies are conducted but not published, we conducted a publication bias analysis. The method uses the funnel plot as exploratory tool to visually assess the possibility of publication bias in the meta-analysis. The funnel plot is essentially a scatter plot of effect sizes against some measure of the studies’ variability. For this analysis we included the standardised mean differences on the  $x$ -axis and standard error on the  $y$ -axis (Figure 2).

In the absence of publication bias, the studies will be distributed symmetrically on both sides of the combined effect size, as we would expect from many individual observations. By contrast, in the presence of possible publication bias, the plot would show a higher concentration of studies on one side of the combined effect size than the other size. As evident by the funnel plot, we see relatively high precision in our studies, as the majority of the studies are placed towards the top of the pyramid (small standard errors) with means distributed evenly around the centre.

Since a purely visual test can be misleading, we apply the trim-and fill asymmetry test (Duval & Tweedie, 2000), which impute missing studies to the plot based on distribution of studies around the combined mean. As we can see from Table 2, the trim-and-fill test has imputed one study on the left side of the centre, indicating that the studies are slightly skewed to the right side. If we include the imputed study, the main effect changes from



**Figure 2:** Funnel plot

$d = -0.05$  with 95 % CI  $[-0.07, -0.04]$  to  $d = -0.06$  with 95 % CI  $[-0.07, -0.04]$ , showing very limited difference in the mean estimate. We can conclude that the possibility of publication bias is minimal, and if there are missing publications, they are likely to be on the negative side of the effect. This further adds to the findings of our main analysis, confirming a stable statistically significant effect of non-standard employment.

## 5. Discussion

### 5.1. Main results

The purpose of this meta-analysis was to address the inconsistent and contrasting results on the effect of non-standard employment on global subjective well-being. This was done by quantitatively summarising the mean difference in global subjective well-being between employees in non-standard employments and employees in permanent contract, and, afterwards, conducting moderator analyses to identify possible explanations for the inconsistent and contrasting results of previous research. To the best of our knowledge, application of meta-analysis to systematically appraise and calculate the effect of non-standard employments on subjective well-being has not been done before.

As evident by the identified studies, all 32 included primary studies investigate some aspect of the relationship between non-standard employment and global subjective well-being. The study limitations and inclusion criteria ensured relative homogeneity in the study designs included in the meta-analyses, by setting specific criteria for population, intervention and outcome. This was done as the first step to address the inconsistent and contrasting results on previous research on the topic, as (especially) non-standard employment indicator as intervention and well-being as outcome have previously been subsumed under all-encompassing terminologies (De Cuyper & De Witte, 2008; De Cuyper et al., 2008; Imhof & Andresen, 2018).

In the inclusion of relevant studies, we made certain concessions in order to include as many relevant studies as possible and keep nuances across studies. This included estimation of  $p$ -value, calculation of different outcomes from different statistical models in addition to including studies of non-representative samples. Wilkin (2013) made similar choices in a

meta-analysis on the effect of non-standard employment on job satisfaction. To statistically control for the various concessions made, we performed various sensitivity analyses, which all indicated that these the choices made no statistical difference to the results of both main and moderator analyses.

The main effect indicates that non-standard employees, as a group, experience slightly lower global subjective well-being ( $d = -0.05$ ) than permanent employees do. The magnitude of this effect size is very small and may be considered negligible in practical importance for outcome. However, even though the magnitude of the difference is small, the result remains highly statistically significant ( $p < 0.00$ ). The statistically significant result is further supported by the publication bias analysis, which suggest that the findings are stable and of relatively high precision. Thus, there is systematic difference in global subjective well-being between employees in non-standard employment and permanent employment. This leads us to conclude that non-standard employments do have a very small negative effect of subjective well-being.

## 5.2. Theoretical implications

The theories on the topic can be divided into two groups: (i) (Work) Stress theories and (ii) Social Comparison & Exchange theories. Both groups of theories suggest that non-standard employment will suffer lower well-being compared to permanent employees due to inferior reward for work. In Work Stress Theories, it is the lack of resources itself that cause the lower well-being through the stress it causes whereas in Social Comparison and Exchange theories it is the unfair distribution of resources in a social relation to the referent “other” that causes lower well-being. Although they differ on the mechanism for why non-standard employment results in lower well-being, the primary antecedent is the employment contract in both groups of theories. Following the assumptions of these theories, the main analysis of the meta-analysis was conducted on the difference in global subjective well-being between the non-standard employees compared to permanent employees.

As previously mentioned, there does not seem to be any systematic difference in the antecedents used in the studies that use Stress theories and the articles that use Social Comparison & Exchange theories. Both groups of theories apply a narrative of a changed labour market that is more flexible, and where insecurity simply is a condition of being an employee. Consequently, the studies focus on insecurity for employees. In extension of this, some studies include measures of job insecurity i.e. the fear of losing one’s job. We therefore have both an objective job insecurity as indicated by employment contract, and a subjective job insecurity as indicated by fear of losing one’s job. In a moderator analysis we identified that the negative effect of non-standard employment on global subjective well-being, completely disappears once job insecurity was included in the explanatory model of the studies’ multivariate analyses. This could indicate that the subjective experience of job security is more important for subjective well-being than the objective employment contract. However, it should be said that subjective job insecurity is known to be strongly correlated with type of employment contract, which means that subjective job insecurity likely is a mediating factor to the outcome of well-being (De Cuyper & De Witte, 2008; De Cuyper et al., 2008; Virtanen et al., 2005). The result of this moderator analyses speaks to the contemporary trend, and condition of the labour market, where employees no longer have a job for life and therefore have to change jobs several times throughout their working lives (International Labor Office, 2016). Similarly, a moderator analysis on the subjective assessment of employability indicates that the negative effect of non-standard employment disappears if employability is included as explanatory variables in the studies’ multivariate



analyses. Employees that feel employable or marketable are therefore not affected by being in non-standard employment.

We also included moderator analyses on the different kinds of well-being indicator as well as the operationalisation of them. Although there does not appear to be any significant difference in the results of studies with affective well-being and studies of evaluative well-being, there is a significant difference between studies that use a single item well-being and those that use a multi item well-being indicator. The moderator analysis indicates that a multi-item well-being indicator, results in a less negative effect, bordering on removing a significant negative effect, of non-standard employment on global subjective well-being. Since the indicators evidently lead to different results, this may have potential implications for future research on global subjective well-being.

Lastly, we included a moderator analysis on the different types of non-standard employment. The rationale for doing this was based on previous research and theory on the topic, which suggests that non-standard is a too heterogeneous grouping of employees. The non-standard employments were grouped into regular (full-time) fixed-term employment, casual employment and agency employment following the argument of who has more reliable working hours and better employment relations with their employer. The results indicate that there is no significant difference in the effect of the respective sub-contracts on global subjective well-being. It does appear that the more reliable contract, the regular (full-time) fixed employment, has slightly better well-being than the two other contracts. The statistical insignificance is most likely due to the large variance of well-being of casual workers and agency workers, which would be rectified with additional studies added to the meta-analysis.

### 5.3. Conclusion and limitations

Thus, the relationship between non-standard employments and subjective well-being in the current framework has been demonstrated. Moreover, enough basis has been provided to reach conclusions on a number of aspects on the topic. First, non-standard employees have slightly lower global subjective well-being than permanent employees, with statistical certainty. Second, the subjective experience of job insecurity is more determining for lower global subjective well-being than the objective position of an employment contract. Third, caution is warranted to the operationalisation of global subjective well-being, as the choice of single or multi item well-being have an influence on the outcome. Throughout the process of conducting this meta-analysis, some critical conceptual and methodological issues have been systematically studied, and some limitations have been identified.

There are some limitations regarding the relatively small number of studies that relate to the framework of investigating the effect of non-standard employment on global subjective well-being. Due to the choice to base the meta-analysis on peer-reviewed studies, we naturally miss some of the grey literature, including studies from agencies, think tanks and NGOs. The inclusion of additional studies in the meta-analysis would enable even more elaborate moderator analyses on the topic, and explore some of the aspects that the currently published data did not allow. Such aspects include distinctions in gender, age, partner status, voluntarism of employment etc. Additionally, the moderator analysis on the different types of non-standard employment would also be more clear-cut, showing a distinction between the contracts. That being said, it is unlikely that more results to the meta-analysis would change the direction or magnitude of outcomes in the main and moderator analyses dramatically, following the highly significant result as well as the publication bias analysis, which testified to the stability of the result.

This study contributes to the research on changing employment arrangement and its effects. More specifically, this study addresses the inconsistent and contrasting results published on the effect of non-standard employment on global subjective well-being and identifies reasons for the inconsistent and contrasting results. Additionally, it gets us closer to a true effect of non-standard employment on global subjective well-being. Compared to other meta-analyses on the topic that study related outcomes, we see results that are very similar to what we find in this meta-analysis. Wilkin (2013) finds a small statistically significant difference in job satisfaction between contingent employees (non-standard employees) and permanent employees at  $d = -0.06$ . Llosa et al. (2018) find the statistically significant result that job insecurity is correlated with risk of poor mental health at  $r = 0.21$ . Cheng and Chan (2008) found with statistical significance that job insecurity is related to trust ( $r = -0.49$ ), work performance ( $r = -0.21$ ) and physical health ( $r = -0.23$ ). The small statistically significant effect ( $d = -0.05$ ) of non-standard employment on global subjective well-being that we find in this meta-analysis is therefore in line with related research on the topic. The assumption that we had going into this analysis, namely that non-standard employment has a negative effect on the well-being of life in general, can therefore be confirmed. However, the results also convey that we might be reaching the limit of what can be measured with such all mean calculation of global subjective well-being, job satisfaction, physical and mental health. The authors of this study would therefore like to encourage future research on the topic to focus on the mechanisms of how non-standard employments affect well-being through either qualitative approach or an individualised well-being approach. Since non-standard employments are a heterogeneous group and the making of well-being may be different from individual to individual, such approaches could provide better insights on the topic of employment relations.

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