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# Job satisfaction and mental health of temporary agency workers in Europe: a systematic review and research agenda

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## ABSTRACT

The current systematic literature review aimed to analyse the associations between temporary agency work (TAW), job satisfaction, and mental health in Europe, as well as to outline a future research agenda. Twenty-eight scientific articles were identified by searching different data bases (i.e. PSYINDEX, PsycINFO, PubMed, and Web of Science) for the time span from January 2000 to December 2016. Our review reveals first that TAW is not consistently negatively related to job satisfaction. However, job insecurity and working conditions are important mediators in the relation of TAW and lowered job satisfaction. Second, TAW is not consistently related to all investigated types of mental health impairments. However, when focusing on specific outcomes and comparing temporary agency workers to permanent employees, we still find consistent evidence regarding higher levels of depression and fatigue among temporary agency workers. Inconsistent associations between TAW, job satisfaction and mental health can partly be attributed to unfavourable methodological aspects of the included primary studies. To address these aspects, future research should consider applying a standard measurement of TAW, including a minimum of meaningful confounding variables, improving the operationalisation of outcome variables and the study design.

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Precarious employment;  
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health outcomes; job  
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## 1. Introduction

Temporary agency work (TAW) is based on a tripartite employment relationship involving a worker, a company acting as a temporary work agency, and a user company. It is a type of flexible employment (De Cuyper, Notelaers, & De Witte, 2009), which refers to employers' "[...] desire for variable (flexible) labour inputs, in terms of numbers employed or hours worked, to match changes in demand for products or services" ("Flexibility," 2017, para. 1) and "[...] to employees' desire for variable (flexible) contractual arrangements and working conditions to match changing private and domestic needs" ("Flexibility," 2017, para. 2).

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Although temporary agency workers are a minority in the labour market (note, however, that based on our own calculation using the European Union Labour Force Survey [EU-LFS] data from 2016 3.7 million European people were employed in TAW at the time), there are important reasons why research should focus on this group of employees. For instance, TAW contracts are typically based on short utilisation times and temporary agency workers are forced to change workplaces and fulfil new requirements (Arrowsmith, 2006). TAW is also experienced as the most insecure contractual form in Europe (Eichhorst & Tobsch, 2017).

The literature widely assumes that TAW is a more unfavourable employment status than permanent work arrangements and is often associated with precarious labour and life situations (Dütsch, 2011; Isaksson & Bellagh, 2002; Kvasnicka & Werwatz, 2003; Wagenaar et al., 2012). This unfavourable status is often due to an unequal and unfair treatment of temporary agency in comparison to core workers (Arrowsmith, 2006). Temporary agency workers often receive lower pay and fewer benefits, they can only infrequently participate in career planning and training, typically hold lower professional ranks (Mitlacher, 2008), get less occupational health and safety trainings, and less access to health promotion activities (Becker & Engel, 2015). In addition, they often work under stressful and hazardous conditions (De Cuyper et al., 2009; De Witte & Näswall, 2003; Kvasnicka & Werwatz, 2003; Silla, Gracia, & Peiró, 2005). All these circumstances account for a specific risk potential of TAW.

As a result of TAW's assumed associations with precarious labour situations, researchers have raised concerns about how it affects work-related attitudes (e.g. organisational commitment, job satisfaction, and turnover intentions; Kim et al., 2012; M. Virtanen et al., 2005; Wilkin, 2013) and employees' health (e.g. self-rated health, anxiety, and depression; Eichhorst & Tobsch, 2017; Isaksson & Bellagh, 2002; Kompier, Ybema, Janssen, & Taris, 2009). Although these concerns are comprehensible, it is currently difficult to judge whether they are empirically justified because there is no systematic review focusing on TAW and mental health. Extant reviews did not differentiate between different forms of atypical work (e.g. fixed-term employment, seasonal/casual work, and on-call work; Ferrie, Westerlund, Virtanen, Vahtera, & Kivimäki, 2008; Kim et al., 2012; Vancea & Utzet, 2016; M. Virtanen et al., 2005). To address this state, we systematically review the existing literature focusing on TAW as predictor variable and job satisfaction as well as mental health as criterion variables to clarify whether TAW in Europe is related to employees' job satisfaction and mental health.

### ***1.1. Why is a review on TAW and mental health in Europe important?***

In many European countries, temporary agency work is a recent and particularly fast growing form of employment (Arrowsmith, 2006; Eurofound, 2017). For instance, from 2009 to 2016 the proportion of temporary agency workers in the Netherlands increased by 51.8 percentage points (Europe: 21.4%, Eurostat, 2018a). In comparison, the proportion of fixed-term employees in the Netherlands increased by 14.4% (Europe: 4.4%) in the same time period (Eurostat, 2018b). In 2016, 1.7% of the European workforce (or 3.7 million people) was working as temporary agency workers. Moreover, temporary agency employment relationships are disproportionately held by younger people (i.e. 57% of the temporary agency workers in Europe are under 30 years, International Confederation of Private

Employment Agencies, 2013). Considering the mere number of European people working in TAW and their often young age, it is crucial to know whether their health may be affected by their specific employment status.

### **1.2. Why do we focus on job satisfaction and mental health?**

In this review, we are interested in both, short-term and long-term consequences of TAW (Faragher, Cass, & Cooper, 2005). Job satisfaction results from a comparison of the desired and actual work situation (Gebert & von Rosenstiel, 2002) and, thus, is a short-term consequence of TAW. One of the most common definitions describe job satisfaction as “the extent to which people like (satisfaction) or dislike (dissatisfaction) their jobs” (Spector, 1997, p. 2). It is a critical component of psychological well-being (Diener, Oishi, & Lucas, 2003) and an indicator of strain. Moreover, it is often conceptualised as a health-related outcome (e.g. Benavides, Benach, Diez-Roux, & Roman, 2000; De Cuyper et al., 2009).

As a potential long-term consequence of TAW, we focus on mental health. It is defined “as a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community” (World Health Organisation, 2007, p. 1).

### **1.3. Theoretical models explaining the associations between TAW and the outcomes**

In this section, we will give an overview of theories predicting associations between TAW and (i) work-related attitudes and (ii) mental health. We apply those theories that are predominantly used in the empirical studies included in our review and, accordingly, focus on segmentation, work-stress, organisational justice, and social exchange theories.

Segmentation theories (Kalleberg, 2003; Reich, Gordon, & Edwards, 1973) focus on social and economic reasons to explain why TAW may be related to unfavourable (mental) health outcomes and they stress the precarious work and life situation of temporary agency workers. These theories suggest that the labour market is divided into core and peripheral workers and that it differentiates between insider (permanent employees) and outsider groups (e.g. temporary agency workers). Employers accordingly offer high-quality employment including learning opportunities, job security, and appropriate salaries to retain core workers while they are unlikely to invest in peripheral workers (Hudson, 2007). Lacking investments foster adverse work-related attitudes (De Cuyper et al., 2007), can be experienced as work stress and, in the long term, can lead to poor mental health (De Witte & Näswall, 2003). According to segmentation theories, TAW is often insecure, related to economic strain (Benach & Muntaner, 2007; Benavides et al., 2000) and implies adverse working conditions (e.g. low control, low social support, more repetitive tasks, and/or monotonous work; Aletraris, 2010; Biggs, 2003; Mitlacher, 2008).

How working conditions and economic strain lead to impairments of temporary agency workers' health can also be explained by stress theories like the Job-Demand-Control Model (R. A. Karasek, 1979), the Effort-Reward-Imbalance Model (Siegrist, 1996), or the Job-Demands-Resources Model of Demerouti, Bakker, Nachreiner, and Schaufeli (2001). These models stress the causal effect of unfavourable working conditions

like low decision latitude (R. A. Karasek, 1979), low rewards (Siegrist, 1996), and job insecurity (Demerouti et al., 2001) on stress.

As a further theoretical approach, organisational justice (Greenberg, 1987) helps to explain the associations of TAW with work-related attitudes and with mental health. It refers “to the extent to which employees perceive workplace procedures, interactions, and outcomes to be fair in nature” (Baldwin, 2006, p. 1). Employees experience their organisation as fair when the benefits are distributed proportionally to the expended efforts (distributive justice), when they have influence on organisational decisions and change processes (procedural justice), when they receive all the necessary information through their supervisors and the social interaction with these supervisors is experienced as respectfully and empathetically (interpersonal justice; Adams, 1965; Colquitt, 2001; Leventhal, 1980). Studies focusing on the consequences of organisational justice have shown systematic associations between justice perceptions and (i) employees’ satisfaction and (ii) health (Cohen-Charash & Spector, 2001; Greenberg, 2010; Robbins, Ford, & Tetrick, 2012).

Social Exchange Theories (SETs; Blau, 1964; Homans, 1961; Thibaut & Kelley, 1959), and especially the Psychological Contract Theory (Rousseau, 1989) also explain the associations of TAW with (i) work-related attitudes and (ii) mental health. SETs emphasise the reciprocity norm and postulate that “[...] voluntary actions of individuals [...] are motivated by the returns they are expected to bring and typically do in fact bring from others” (Blau, 1964, p. 91). The term psychological contract refers to situations “when an individual perceives that contributions he or she makes obligate the organization to reciprocity (or vice versa)” (Rousseau, 1989, p. 124). Temporary agency workers contribute loyalty, commitment, and performance and, in return, they expect job security, prospects for personal growth, educational opportunities, and/or appropriate salaries (Coyle-Shapiro & Parzefall, 2008; Robinson, 1996). Psychological contract breach may occur if employers do not respond as expected to the efforts of temporary agency workers. Those workers’ responses may in turn occur in the form of reduced loyalty, commitment, and inner resignation (Kirpal & Biele Mefebue, 2007; Rousseau, 1989). Furthermore, violating the contract on the part of the employer may lead to stress experiences and long-term adverse health effects among temporary agency workers (Guest & Conway, 2003).

Against the backdrop of these theoretical approaches, we give an up-to-date overview of the literature regarding the relations of TAW in Europe with (i) work-related attitudes and (ii) mental health. We generate a systematic empirical review of the scientific evidence to answer the following research questions:

- (1) Is TAW in Europe empirically related to job satisfaction?
- (2) Are the observed associations of job insecurity and/or working conditions with TAW and job satisfaction consistent with mediation (i.e. job insecurity and/or working conditions as mediators of the TAW-job satisfaction relation)?
- (3) Is TAW in Europe empirically related to mental health?
- (4) Are the observed associations of job insecurity and/or working conditions with TAW and mental health consistent with mediation (i.e. job insecurity and/or working conditions as mediators of the TAW-mental health relation)?

## 2. Method

### 2.1. Study selection

We performed a systematic literature review to examine the existing studies on TAW and its associations with (i) job satisfaction in the client organisation and (ii) various mental health outcomes. Of course, meta-analysing would be a powerful tool if the identified studies are comparable with regard to dependent variables and included confounders. However, studies comprised in our review are too heterogeneous with regard to these aspects; thus, summarising the evidence in a narrative way appeared more useful. In addition, the number of studies with available data to compute effect sizes was not sufficient to perform a meta-analysis, especially regarding mental health outcomes studied in prior research: The included studies use different mental health outcomes, which are not directly comparable and, thus, need to be analysed separately. Our narrative approach allows analysing the associations of TAW (i.e. the predictor), job insecurity/working conditions (as potential mediator variables), and outcome variables in depth and simultaneously considering the heterogeneity of mental health outcomes in the studies.

TAW is often analysed together with further temporary employment forms and scholars do often not differentiate between these forms, for instance between TAW and fixed-term employment. To allow for unambiguous conclusions, mixed samples of temporary agency workers and other forms of atypical employment were excluded from the current review. We included studies published in English and German that explicitly compared temporary agency workers and permanent employees with full-time contracts in Europe.

In general, a comparative analysis of TAW worldwide is rather difficult because there is international heterogeneity concerning the definition of TAW and the labour laws regulating this employment form (Gleason, 2006). However, the Directive on Temporary Agency Work (European Commission, 2014) defines a general framework applicable to the working conditions of temporary workers in the European Union. The aim of the Directive is to guarantee a minimum level of effective protection for temporary workers. For instance, regarding the essential conditions of work and of employment the Directive determines the principle of non-discrimination between temporary agency workers and workers who are recruited by the user company (see also European Commission, 2018). We accordingly limited this review to member states of the European Union to reach sufficient comparability for our review. We are, however, aware that TAW in Europe is characterised by different national regulations and that TAW may refer to different employment arrangements in European countries (Peck & Theodore, 2002).

### 2.2. Search strategy

The search was performed in two steps. As part of a larger research project, a first search was performed in January 2015 for all types of atypical employment (i.e. temporary agency work, fixed-term employment, part-time employment, self-employment, and multiple job holding). In December 2016, the procedure was repeated to identify studies on TAW published since the first search.

Scientific articles were identified from the following databases: PSYNDEX, PsycINFO, PubMed, and Web of Science. The search was complemented by manually searching the bibliographies of included and not included articles, previous reviews (e.g. Ferrie et al., 2008; M. Virtanen et al., 2005), and pertinent books (e.g. Barling & Frone, 2004; Guest & Clinton, 2010). The keywords and search terms to identify studies of TAW include general terms for atypical employment forms like “flexible work arrangements” and “contingent employment” as well as specific search terms for TAW like “temporary agency work,” “employment agency work,” and “temporary employment agency.” The search was limited to the period from 2000 until 2016 because previous evidence suggests a rapid increase in TAW and changes in several regulations of TAW since the end of the 1990s (European Commission, 2014; Manske & Scheffmeier, 2015; Michon, 1999).

After excluding duplicates, the search yielded 2936 references for different atypical employment forms, job satisfaction, and mental health for the period from January 2000 to December 2016. Based on abstract and full-text screening we identified 28 studies on the association between TAW and job satisfaction as well as TAW and mental health. Some of the 28 studies include more than one association. Thus, 45 effect sizes are described and interpreted below.

Studies that did not compare temporary agency workers to permanent employees ( $k = 2046$ ) or did not study relevant outcomes (e.g. performance, motivation, physical health status or musculoskeletal disorders;  $k = 578$ ) were excluded from our review. Also, qualitative studies and studies with insufficient information on data (e.g. ambiguity whether temporary agency workers were examined) and methods were excluded ( $k = 284$ ).

## **2.3. Measures**

### **2.3.1. Job satisfaction as the first criterion variable**

The included studies predominantly used two job satisfaction measures. First, participants were asked how satisfied they were with their (main) jobs (e.g. Benavides et al., 2000; Busk, Jahn, & Singer, 2015). Second, participants were asked how satisfied they were with the working conditions in their (main) job (e.g. Benach, Gimeno, Benavides, Martinez, & Del Mar Torné, 2004; Nienhüser & Matiaske, 2003; Wagenaar et al., 2012). One study measured job satisfaction with both questions (Wagenaar et al., 2012) and some studies measured job satisfaction with four to eight items covering satisfaction with different job facets (e.g. working conditions, wage, job security, working time; De Cuyper et al., 2009; De Graaf-Zijl, 2012; Flickinger, Allscher, & Fiedler, 2016).

### **2.3.2. Mental health as the second criterion variable**

Mental health refers to emotional, psychological, and social well-being. We found the following indicators for mental health in our literature search: Mental health (general), affective symptoms, anxiety, burnout/exhaustion/fatigue, depressive symptoms, and stress. Studies on mental health in general ( $k = 3$ ) used the General Health Questionnaires (GHQ) or collected various mental health aspects and calculated additive indexes. Studies on specific mental health outcomes ( $k = 13$ ) like depression, burnout or anxiety predominantly used established scales (e.g. 10-item Center for the Epidemiological Studies of Depression Short Form [CES-D-10; Radloff, 1977]; Utrechtse Burnout Schaal [UBOS; Schaufeli & Van Dierendonck, 2000], State-Trait Anxiety Inventory [STAI; Spielberger,

Gorsuch, & Lushene, 1970; Spielberger, 1989], Maslach Burnout Inventory – General Survey [MBI-GS; Schaufeli, Leiter, Maslach, & Jackson, 1996]). Studies on stress ( $k = 5$ ) predominantly used an one-item measure and asked participants whether stress is one of the reasons why their work affects their health (e.g. Benach et al., 2004; Benavides et al., 2000). Only the study by Boscolo et al. (2009) used the Italian version of the Job Content Questionnaire (R. Karasek et al., 1998), which is composed of 46 items measuring stress.

### 2.3.3. *Job insecurity as the first mediator*

Job insecurity can be defined as “[...] overall concern about the continued existence of the job in the future” (Heaney, Israel, & House, 1994, p. 1431). Five studies included job insecurity in the analyses. Four of the included studies measured job insecurity with one question (e.g. “How concerned are you about the following issues?” and the subsequent response option, “Your job security (if employed)”; Busk et al., 2015; Green & Heywood, 2011; Grund, Martin, & Minten, 2015; Jahn, 2015). Only one study used a two question-scale to measure job insecurity (Wagenaar et al., 2012).

### 2.3.4. *Working conditions as the second mediator*

In the included studies, the term “working conditions” refers to various job dimensions: First, physical working conditions (e.g. constrained posture or working in noisy conditions), second psycho-social working conditions (e.g. demands, autonomy, or social support), third working time conditions (e.g. overtime or weekly working hours), and fourth organisational working conditions (e.g. wage, provided training, or compensation for overtime). Ten of the included studies empirically investigated working conditions in their analyses (i.e. as covariates). Four of these ten studies included only one specific working condition. For instance, the studies of Grund et al. (2015) and Forde and Slater (2006) focused on working hours and the study of Dütsch (2011) focused on autonomy. The remaining six studies included a minimum of two working conditions. Most of these studies assessed working conditions from each of the categories mentioned above (e.g. Jahn, 2015; Kvasnicka & Werwatz, 2003; Nienhüser & Matiaske, 2003).

## 3. Results

We present the results grouped by job satisfaction (see Table 1) and mental health (see Table 2). In our tables, information about authors, year of publication and country of origin, study characteristics as well as study results are given. The tables also report the included covariates. If the analyses included several working conditions from different job dimensions (see the above description), the tables contain the general note “working conditions.” Otherwise the specific working condition is named. To render the studies comparable, Cohen’s  $d$  was calculated as effect size metric if all necessary information was available. The effect sizes were interpreted in line with Cohen (1988) as small ( $d < 0.5$ ), moderate ( $d = 0.5–0.8$ ), or large ( $d > 0.8$ ). The results were sorted by country and author to allow for first impressions of potential country-specific results.



**Table 1.** Selected studies on TAW and job satisfaction sorted by country.

No.	Authors and year	Study Design (survey year)	N	Outcome measures	Statistical analysis	Association <sup>a</sup> / Direction <sup>b</sup> / (Effect size <sup>c</sup> )	Covariates included
<b>Belgium</b>							
1	De Cuyper et al. (2009)	Cross-sectional (2005)	418	Job satisfaction	Correlation	no→ (.10)	no
<b>Europe</b>							
2	Benach et al. (2004)	Cross-sectional (1995)	15,146	Job satisfaction	Logistic regression*	yes↓ (.43 <sup>c</sup> ) yes↓ <sup>d</sup> (.50 <sup>c</sup> )	Age
3	Benach et al. (2004)	Cross-sectional (2000)	19,405	Job satisfaction	Logistic regression*	yes↓ (.29 <sup>c</sup> ) yes↓ <sup>d</sup> (.43 <sup>c</sup> )	Age
4	Benavides et al. (2000)	Cross-sectional study (1995)	15,146	Job satisfaction	Logistic regression*	yes↓ (.45 <sup>c</sup> ) yes↓ <sup>d</sup> (.50 <sup>c</sup> )	Age, sex
5	Nienhüser and Matiaske (2003)	Cross-sectional study (2000)	16,350	Job dissatisfaction	Logistic regression*	no→ (.25) no→ <sup>d</sup> (.40)	Types of employment, firm size, age, sex, (further) education, qualification, income, working conditions, current equality principle
6	Wagenaar et al. (2012)	Cross-sectional (2001, 2005)	44,194	Work satisfaction	MANOVA*	yes↓ (.29)	Age, demand, control, insecurity
<b>Germany</b>							
7	Bornewasser (2010)	Cross-sectional study (2010)	140	Job satisfaction	Not reported*	no→	no
8	Brenke (2015)	Cross-sectional (2013)	Not reported	Job satisfaction	Means*	yes↓	no
9	Busk et al. (2015)	Longitudinal (2002-2006)	2029	Job satisfaction	Ordinary least squares regression	men: yes ↓ (.35 <sup>c</sup> )	Hartz reforms (2004), age, education, citizenship, children in the household, marital status, indicator for being sick for more than 6 weeks, blue collar worker, duration of unemployment experience, region, the yearly regional unemployment rate, year and a wave dummy indicating how many times the worker previously answered the questionnaire
10	Dütsch (2011)	Cross-sectional (2006)	1098	Job satisfaction	Propensity scoreMatching*	yes↓	Sex, age, nationality, region, marital status, children, education, occupation, firm size, former employment status, working conditions, job insecurity
11	Flickinger et al. (2016)	Cross-sectional (2006)	593	Job satisfaction	Correlation	no→	no
12	Grund et al. (2015)	Longitudinal (2001-2012)	15,309	Job satisfaction	Ordinary least squares regression/ fixed-effects model*	no→ (.08)	Age, marital status, child below 16 years in household, health status, years of unemployment, distance to workplace, job in learned profession, education, occupational status, weekly working time (actual and favoured), job insecurity, region

(Continued)

Table 1. Continued.

No.	Authors and year	Study Design (survey year)	N	Outcome measures	Statistical analysis	Association <sup>a</sup> / Direction <sup>b</sup> / (Effect size <sup>c</sup> )	Covariates included
13	Jahn (2015)	Longitudinal (2001-2008)	14,235 women: 6865 men: 7370	Job satisfaction	Fixed-effects model*	women: no→ (.17 <sup>c</sup> ) men: yes↓ (.17 <sup>c</sup> )	Age, marital status, child below 16 years in household, sick leave, education, weekly working time, job tenure, overtime, blue-collar worker, time spent unemployed, public firm, firm size, workplace benefits, regional growth rate, regional employed rate, perceived employment security, working conditions
14	Kvasnicka and Werwatz (2003)	Cross-sectional (2001)	2222	Job satisfaction	Mean*	no→	Work related characteristics
15	Lemanski (2012)	Case study	18	Work dissatisfaction	Correlation	no→ (.02)	No
16	Pietrzyk (2004)	Cross-sectional study (2001)	98	Job satisfaction	MANOVA*	yes↓	Occupational field, qualification, sex
17	Schlese, Schramm, and Bulling-Chabalewski (2005) <sup>e</sup>	Cross-sectional (2001, 2003, 2004)	27.993600–29.024400	Job satisfaction	Mean*	yes↓	no
<b>Netherlands</b>							
18	De Graaf-Zijl (2012)	Cross-sectional and longitudinal (1995-2002)	6952	Job satisfaction	Fixed-effects model*	yes↓	Personal characteristics, job characteristics
19	Kompier et al. (2009)	Cross-sectional (2004)	2454	General work satisfaction	ANOVA*	yes↓ (.55 <sup>c</sup> )	Age
20	Wagenaar et al. (2012)	Cross-sectional (2008)	18,142	Work satisfaction	MAN(C)OVA*	yes↓	Age, demand, control, insecurity
<b>Portugal</b>							
21	Chambel (2014)	Cross-sectional	444	Job satisfaction	Mean	no→ (.17)	no
<b>United Kingdom</b>							
22	Forde and Slater (2006)	Cross-sectional (2000)	2466	Job satisfaction	Ordered probit analysis*	yes↓	Sex, age, dependent children, marital status, education, other qualification, occupation, industry, sector, hours, tenure, region
23	Green and Heywood (2011)	Longitudinal (1999-2004)	11,433	Job satisfaction	Fixed-effect ordered probit analysis*	Women: no→, Men: no→	Region, year, industry, occupation, tenure, wage, performance/bonus pay, hours, overtime, union member, sector, manager, firm size, employer pension, employer training, working conditions
24	Toms and Biggs (2014)	Qualitative study supplemented by cross-sectional quantitative data	96	Job satisfaction	Mean*	no→ (.07)	no

<sup>a</sup>Significant association between TAW and job satisfaction

<sup>b</sup>↑ significantly higher level of job satisfaction, ↓significantly lower level of job satisfaction, → no statistically significant difference

<sup>c</sup>Effect size while controlling for included covariates

<sup>e</sup>Results apply to part-time temporary agency workers.

<sup>f</sup>This is an unusual sample size because the authors extrapolate their results from their original sample size. However, they only report the extrapolated sample size.

\*Explicit aim is to examine the association of TAW and job satisfaction.

**Table 2.** Selected studies on TAW and mental health sorted by outcome measures and country: mental health (general), affect, anxiety, burnout/exhaustion/fatigue, depressive symptoms, and work-related stress.

No.	Authors and year	Study Design (survey year)	N	Outcome measures	Statistical analysis	Association <sup>a</sup> / Direction <sup>b</sup> / (Effect size <sup>c</sup> )	Covariates included
<b>Mental health (general)</b>							
<b>Germany</b>							
1	Becker, Brinkmann, and Engel (2013)	Cross-sectional (2005)	78	Mental health impairment	Mean/t-test*	no→ (.01)	no
2	Pietrzyk (2003, 2004)	Cross-sectional (2001)	98	Mental health	MANOVA*	yes↑	Occupational field, qualification, sex
3	Richter (2006)	Cross-sectional	577	Mental health	MANOVA*	no → (.38)	no
<b>Affective symptoms</b>							
<b>Germany</b>							
4	Dütsch (2011)	Cross-sectional (2006)	1074	Felt relaxed and well-balanced- last 4 weeks	Propensity scoreMatching*	no→	Sex, age, nationality, region, marital status, children, education, occupation, firm size, former employment status, working conditions, job insecurity
5	Dütsch (2011)	Cross-sectional (2006)	1074	Felt full of energy – last 4 weeks	Propensity scoreMatching*	yes↑	Sex, age, nationality, region, marital status, children, education, occupation, firm size, former employment status, working conditions, job insecurity
6	Martin (2006)	Cross-sectional (2002)	945	Positive affect	ANOVA*	no→ (.11)	no
7	Martin (2006)	Cross-sectional (2002)	945	Negative affect	ANOVA*	no→ (.06)	no
<b>Anxiety</b>							
<b>Italy</b>							
8	Boscolo et al. (2009)	Cross-sectional	55	Anxiety	ANOVA*	no→ (.82)	no
<b>Depressive symptoms</b>							
<b>Germany</b>							
9	Dütsch (2011)	Cross-sectional (2006)	1074	Felt run-down and melancholy- last 4 weeks	Propensity scoreMatching*	yes↑	Sex, age, nationality, region, marital status, children, education, occupation, firm size, former employment status, working conditions, job insecurity
<b>Netherlands</b>							
10	Kompier et al. (2009)	Cross-sectional (2004)	2454	Depressive symptoms	ANOVA*	yes↑ (.50)	Age
<b>Burnout, exhaustion, fatigue</b>							
<b>Europe</b>							
11	Benach et al. (2004)		15,146	Overall fatigue	Logistic regression*		Age

(Continued)

Table 2. Continued.

No.	Authors and year	Study Design (survey year)	N	Outcome measures	Statistical analysis	Association <sup>a</sup> / Direction <sup>b</sup> / (Effect size <sup>c</sup> )	Covariates included
12	Benach et al. (2004)	Cross-sectional (1995)	19,405	Overall fatigue	Logistic regression*	yes↑ (.22 <sup>c</sup> )	Age
						no→ <sup>d</sup> (.05 <sup>c</sup> )	
13	Benavides et al. (2000)	Cross-sectional (1995)	15,146	Overall fatigue	Logistic regression*	no→ (.10 <sup>c</sup> )	Age, sex
					no→ <sup>d</sup> (.28 <sup>c</sup> )		
<b>Netherlands</b>							
14	Kompier et al. (2009)	Cross-sectional (2004)	2454	Emotional exhaustion	ANOVA*	no→ (.13)	Age
15	Wagenaar et al. (2012)	Cross-sectional (2008)	18,142	Emotional exhaustion	MAN(C)OVA*	no→	Age, demand, control, insecurity
<b>Portugal</b>							
16	Mendes, Claro, and Robazzi (2014)	Cross-sectional	95	Burnout	ANOVA*	no→	no
<b>Work-related stress</b>							
<b>Europe</b>							
17	Benavides et al. (2000)	Cross-sectional (1995)	15,146	Stress	Logistic regression*	yes↓ (.28 <sup>c</sup> )	Age, sex
					yes↓ <sup>d</sup> (.20 <sup>c</sup> )		
18	Benach et al. (2004)	Cross-sectional (1995)	15,146	Stress	Logistic regression*	yes↓ (.28 <sup>c</sup> )	Age
					no→ <sup>d</sup> (.20 <sup>c</sup> )		
19	Benach et al. (2004)	Cross-sectional (2000)	19,405	Stress	Logistic regression*	yes↓ (.38 <sup>c</sup> )	Age
					yes↓ <sup>d</sup> (.51 <sup>c</sup> )		
<b>Germany</b>							
20	Lemanski (2012)	Case study	18	Acute stress	Correlation*	yes↓ (1.09)	no
<b>Italy</b>							
21	Boscolo et al. (2009)	Cross-sectional	55	Occupational stress	ANOVA*	no→ (.08)	no

<sup>a</sup>Significant association between TAW and Mental health (general), Affect, Anxiety, Burnout/Exhaustion/Fatigue, Depression, and Work-related stress

<sup>b</sup>↑ significantly higher level of mental health impairments, ↓significantly lower level of mental health impairments, → no statistically significant difference

<sup>c</sup>Effect size while controlling for included covariates

<sup>d</sup>Result apply to part-time temporary agency workers.

\*Explicit aim is to examine the association of TAW and mental health.

### 3.1. The relation of TAW and job satisfaction: description of studies

Results of twenty-four studies on TAW and job satisfaction were retrieved and are summarised in Table 1. Most of the studies were conducted in Germany ( $k = 11$ ), followed by European-level studies ( $k = 5$ ). Three studies were conducted each in the Netherlands and in the United Kingdom and one study in Belgium as well as in Portugal. Seventeen studies are cross-sectional, four studies are longitudinal, one study uses both methodological designs (study: 18, cf. Table 1), one study is a case study (study: 15), and one study includes a mix of qualitative and cross-sectional quantitative data (study: 24). Sample sizes vary from 18 to 29,024,400 participants. Most of the studies have sample sizes with a minimum of 2000 participants. One study (study: 9) includes only men while the rest of the studies comprises both men and women. Only two studies report gender-stratified results (studies: 13, 23). Moreover, four studies report (studies: 2, 3, 4, 5) results for part-time and full-time temporary agency workers separately. In most samples, participants were recruited from the unselected general working population covering various industries and occupations (79% of the included studies). One of the remaining studies is each carried out in an industrial enterprise (study: 7), an industrial service (study: 15), the technical professional sector (study: 16), a call-center (study: 21), and a retail/service company (study: 24). Only six studies (studies: 1, 15, 16, 20, 21, 24) use job satisfaction scales with two or more items.

The main statistical methods in this group of studies are linear or logistic regression analysis. Five out of 24 studies include covariates reflecting only demographic characteristics (e.g. sex, age, education etc.). Eleven studies additionally include covariates on the organisational level like job insecurity, working conditions, firm size etc., and two German studies (studies: 9, 13) also include macroeconomic factors as covariates like labour market reforms or regional employment rate. Nineteen out of 24 studies (studies: 2-8, 10, 12-14, 16-20, 22-24) in this review explicitly aim to analyse the association between TAW and job satisfaction. Thirteen out of 24 studies report all necessary information to calculate Cohen's  $d$ . These studies observe predominantly small effect sizes. Only two studies report medium effect sizes (studies: 4, 19). The average value of Cohen's  $d$  for all studies is .30 [.02; .55].

Below, we first report the results of studies that only present adjusted results or results with no adjustment for confounding variables (17 studies). Afterwards, we focus on studies reporting adjusted as well as unadjusted results to analyse the role of job insecurity and working conditions as potential mediators (seven studies).

### 3.2. The relation of TAW and job satisfaction (research question 1)

Seven studies from several countries (e.g. Germany, Netherlands, and United Kingdom; studies: 2, 3, 4, 10, 16, 19, 22) report statistically significant negative associations between TAW and job satisfaction, i.e. temporary agency workers report lower job satisfaction as compared to permanent employees (mean Cohen's  $d = .45$  [.29, .55]). In these studies, adjustment for confounding variables is made (e.g. age, sex, education, or qualification). Two German studies (studies: 8, 17) show significant negative associations between TAW and job satisfaction as well, but only report bivariate results (i.e. no adjustments for potential confounders were made).

Six studies (studies: 1, 7, 11, 15, 21, 24) do not find a statistically significant association of TAW and job satisfaction. In these studies, no adjustment for confounding variables is made (i.e. no covariates are included in the analyses; mean Cohen's  $d = .09$  [.02; .17]). Moreover, the remaining two studies (studies: 9, 14) report only adjusted results. The study of Busk et al. (2015, study 9) finds a statistically significant negative relation of TAW and job satisfaction while controlling for different variables (e.g. age, education, and duration of unemployment experience, Cohen's  $d = .35$ ). However, the association of TAW and job satisfaction does not persist after including the variable "reform," which refers to the changes in the regulation of TAW in Germany in 2003. The study of Kvasnicka and Werwatz (2003, study 14, not all necessary information to calculate Cohen's  $d$  are reported) does not find a statistically significant relation.

### **3.3. Potential mediators of the relation of TAW and job satisfaction (research question 2)**

In seven studies (studies: 5, 6, 12, 13, 18, 20, 23), adjusted and unadjusted results regarding the association of TAW and job satisfaction are presented (mean Cohen's  $d = .23$  [.08; .40]). Three studies control only for working conditions (such as physical working conditions, autonomy, and social support; study: 5, 18, 23), three studies control for job insecurity and working conditions separately (studies: 6, 12, 20) and one study (study: 13) analyses the effect of working conditions separately as well as the combined effect of job insecurity and working conditions. All these seven studies show in the unadjusted analyses that temporary agency workers are less satisfied than permanent employees are.

Regarding job insecurity, either the association of TAW and job satisfaction does not persist after adjustment or a significant reduction in variance explained by TAW occurs after controlling for job insecurity. A parallel pattern is observed when working conditions are included in the analyses. These results patterns are consistent with the possibility that higher job insecurity and less favourable working conditions in fact mediate the potential impact of TAW on job satisfaction.

Three of the studies reporting only adjusted results (studies: 10, 14, 22) include job insecurity and/or working conditions as potential confounding variables. One of the studies (study 14), does not show a statistically significant relation of TAW and job satisfaction when controlling for the covariates influences while the two remaining studies do show a significant relation. Given that no unadjusted values are reported, a mediating role of job insecurity and working conditions can neither be excluded nor confirmed for this group of studies.

### **3.4. The relation of TAW and mental health: description of studies**

Our findings are based on 21 associations of TAW and mental health. The results are summarised in Table 2 and are classified into five outcome groups: General mental health ( $k = 3$ ), affective symptoms (e.g. feeling balanced or full of energy;  $k = 4$ ), anxiety ( $k = 1$ ), burnout/exhaustion/fatigue ( $k = 6$ ), depressive symptoms ( $k = 2$ ), and work-related stress ( $k = 5$ ). With respect to national contexts, most of the included associations are based on German samples ( $k = 9$ ). Three studies are based on European-level samples. Furthermore, three studies were conducted in the Netherlands, two in Italy, and one in

Portugal. With the exception of one case study (study: 20, cf. Table 2) all studies in this category are cross-sectional. Sample sizes vary from 18 to 19,405 participants. Eleven out of 21 studies have sample sizes with a minimum of 2000 participants. The majority of the included studies neither specify participants' occupations nor focused industries but uses representative samples of the general working population. One study each focuses on technical professions (study: 2), nurses (study: 16), and industrial services (study: 20). Two studies analyse university staff (studies: 8, 21).

Main statistical methods in this group of studies are (M)ANOVA as well as linear or logistic regression analysis. Thirteen studies include covariates in the analyses. Only two studies (Dütsch, 2011; Wagenaar et al., 2012) include job insecurity and/or working conditions as covariates beyond demographic information. All included studies explicitly aim to analyse the association between TAW and mental health outcomes. Fifteen out of 21 studies report the necessary information to calculate Cohen's  $d$ . The included studies predominantly show small effect sizes ( $k = 9$ ). Four studies report medium effect sizes (studies: 8, 10, 19, 20). The average value of Cohen's  $d$  for all studies is .28 [.00; 1.09] (the mean for general mental health is  $d = .20$  [.01; .38], for affective symptoms  $d = .09$  [.06; .11], for anxiety  $d = .82$ , for burnout/exhaustion/fatigue  $d = .14$  [.00; .28], for depressive symptoms  $d = .50$ , and for work-related stress  $d = .38$  [.08; 1.09]).

Again, we first report the results of studies that present only adjusted results or results with no adjustment for confounding variables (20 studies). Afterwards, we focus on studies reporting adjusted as well as unadjusted results (1 study).

### 3.5. The relation of TAW and mental health (research question 3)

Regarding general mental health and several psychological disorders, six studies from Germany, the Netherlands, and on the European level find statistical associations between TAW and poor mental health, whereas ten German, Dutch, Italian, Portuguese, and European studies do not empirically confirm the presumed associations.

In detail, worse general mental health among temporary agency workers is reported in one German study (study: 2) while controlling for potential confounding variables (occupational field, professional qualification, and sex). The other two studies show no significant correlations (studies: 1, 3). Regarding affective symptoms, one of four studies reports a significant result: Temporary agency workers feel less energy than permanent employees in Germany (study: 5). Again, this result is observed while controlling for potential confounding variables like sex, education, working conditions, and job insecurity.

The single study from Italy on TAW and anxiety shows a high effect size (Cohen's  $d = .82$ ), but does not find a significant result, potentially due to low statistical power (study: 8). Two studies (studies: 11, 13) on the European level based on the same database (European Working Condition Survey [EWCS] 1995; Paoli, 1997) report TAW to be significantly associated with overall fatigue only in full-time but not in part-time temporary agency workers (Benach et al., 2004; Benavides et al., 2000). While the study of Benach et al. (2004) considers age as potential confounding variable, the study of Benavides et al. (2000) additionally includes participants' sex. In contrast, the study based on the EWCS data from 2000 (study: 12) does not find a significant association of TAW and overall fatigue, neither for full-time nor for part-time temporary agency workers. Despite differences in national contexts, included confounding variables (see Table 2),

and the specific measurement of depressive symptoms, both studies (one study from Germany [study: 9] and one study from the Netherlands [study: 10]) show that TAW is significantly associated with depressive symptoms.

Concerning the perception of work-related stress, four studies (one from Germany and three on the European level) report lower stress levels among temporary agency workers compared to permanent employees. The three European-level studies include control variables. Another study from Italy does not find an association between employment status and the observed stress-level.

### **3.6. Potential mediators of the relation of TAW and mental health (research question 4)**

Only the studies of Dütsch (2011) and Wagenaar et al. (2012) include job insecurity and/or working conditions (demands and autonomy/control) in the analyses. However, only Wagenaar et al. (2012) report unadjusted as well as adjusted results. These authors do not find differences in the level of exhaustion between temporary agency workers and permanent employees. This result also persists after including working conditions and job insecurity in the model.

Dütsch (2011) shows that temporary agency workers on the one hand feel less energy and report more depressive symptoms than the control group of permanent employees, which is similar to the temporary agency workers with respect to demographic and work-related characteristics. On the other hand, this study does not show any difference between the two groups with regard to the feeling of mental balance.

## **4. Discussion**

### **4.1. Overview of results**

In this paper, we systematically reviewed the existing European studies on the associations between TAW as a predictor and job satisfaction and mental health as criterion variables. Based on various theoretical approaches we assumed that TAW is negatively related to job satisfaction and temporary agency workers' mental health. Furthermore, we expected that job insecurity and working conditions may play a mediating role in the associations of TAW, job satisfaction, and mental health. Our systematic review reveals that TAW is not consistently associated with job satisfaction. Nonetheless, half of the studies reveal less job satisfaction of temporary agency workers in comparison with permanent employees. Moreover, in line with the selected theoretical approaches, we find initial evidence that job insecurity and unfavourable working conditions may mediate the impact of TAW on job satisfaction.

Similarly, as a broad conclusion, most of the included studies do not find an association between TAW and various mental health outcomes, but, as a more specific conclusion, a few studies provide consistent evidence for a given association of TAW and specific mental health outcomes, in particular regarding depression. Furthermore, because we could only include one study addressing this aspect we do not find clear evidence for job insecurity and unfavourable working conditions as potential mediators of the impact of TAW on mental health.



## 4.2. Comparison with existing reviews

The existing reviews mostly investigate different forms of flexible employment without specifically analysing results for temporary agency workers (Ferrie et al., 2008; Kim et al., 2012; Vancea & Utzet, 2016; M. Virtanen et al., 2005). Furthermore, the reviews focus only on health outcomes and not on job satisfaction. The narrative and less specific reviews of Ferrie et al. (2008) and Kim et al. (2012) and also the meta-analysis of M. Virtanen et al. (2005) show mixed findings with regard to (i) temporary work, (ii) precarious work and various mental health outcomes. However, Ferrie et al. (2008) concluded that there was evidence for associations of temporary work with most measures of mental health. M. Virtanen et al. (2005) suggest a specific relationship of temporary employment and increased psychological morbidity. Despite this initial evidence and although we provide the first systematic review specifically focusing on TAW and mental health, we do not find consistent overall evidence for this association. We assume that the previously reported inconsistent findings were not solely due to the rather broad analysis of atypical employment (ATE) versus the more specific analysis of TAW, but also due to other reasons (see the next section for the related discussion).

Furthermore, the review of Kim et al. (2012) reveals that welfare regimes may be an important determinant in the association of ATE and mental health. Precarious workers in Scandinavian welfare states report a better or equivalent health situation as compared to permanent employees. By contrast, Kim et al. (2012) show that in Bismarckian (e.g. Belgium, Netherlands, and Germany) and Southern (e.g. Spain and Italy) welfare states precarious forms of employment are significantly associated with higher risks of mental illness. As one potential explanation, this result may be attributed to the relative strength of organised labour in different welfare systems. Compared to Scandinavian states, Bismarckian welfare states are characterised by a weaker labour organisation with regard to rates of unionisation, bargaining coverage, and unemployment benefits (Kim et al., 2012). In our systematic review, we did not observe comparable evidence for welfare regimes as a moderator of the TAW-mental health relationship. Future research is, thus, desirable that analyses the role of welfare regimes in this relationship.

## 4.3. Heterogeneity between studies and related limitations of the review

This review uncovers a high degree of heterogeneity between studies with regard to national context, study design, study sample, included potential confounding variables, and operationalisation of outcome measures. The observed inconsistent study results can be partly explained by different aspects of this heterogeneity.

*First*, mixed findings can be partly explained by national contexts. The studies were conducted in six European countries, which all have their own labour organisations including specific regulations of TAW. Several authors point out that these regulations result in differing workforce characteristics and work situations of temporary agency workers (e.g. Gleason, 2006; Peck & Theodore, 2002; Vanselow & Weinkopf, 2009). However, studies from identical national backgrounds report inconsistent results as well. For instance, three out of eleven German studies report a significant negative association of TAW and job satisfaction and the remaining eight German studies do not find any

significant association. Therefore, the different national contexts of the included studies are probably only a partial explanation of differing results.

*Second*, mixed findings result from study design aspects with regard to cross-sectional versus longitudinal designs, participant selection, data collection, and data analysis strategies. Because the majority of the included studies are cross-sectional and thus do not observe changes over time, there might be an overestimation of effect sizes (for instance, due to common method biases; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Longitudinal study designs are more effective in analysing causality given that inter-individual differences can be observed over time and confounding variables can be more effectively controlled. However, in our specific field of research, selection biases and selective participant attrition in longitudinal designs can lead to an underestimation of negative health consequences and the “healthy worker effect” (Baillargeon, 2001) must be considered as a possible bias. TAW is more common among younger people with shorter tenure who are also healthier. In case of a positive selection of young healthy individuals into TAW, less healthy workers remain in unemployment (“healthy hire effect”). Besides, we might observe an out-selection of less healthy temporary agency workers that drop back into unemployment while healthier employees remain (“healthy worker survivor effect”; Carpenter, 1987; Fox & Collier, 1976). Non-significant associations of TAW and job satisfaction could also be caused by participant attrition (i.e. systematic drop-out): While satisfied temporary agency workers have a higher probability of staying in the organisation (and possibly also in this employment form), unsatisfied temporary agency workers have a higher probability to leave the organisation (Lambert, Hogan, & Barton, 2001; Slattery & Rajan Selvarajan, 2005).

Chadi and Hetschko (2016) additionally point to the important role of the point in time when an observation takes place. According to the authors fixed-term workers are more likely to be observed in the happy period right after starting in a new job than permanent workers (“honeymoon-effect,” see Boswell, Boudreau, & Tichy, 2005). This might explain why both groups report similar levels of job satisfaction on average and the neglect of the honeymoon-effect might be responsible for the inconclusive evidence found in different studies (e.g. Näswall & De Witte, 2003; Waaijer, Belder, Sonneveld, van Bochove, & van der Weijden, 2016; Zeytinoglu et al., 2013). This phenomenon could also explain the inconclusive results regarding TAW and job satisfaction. While temporary agency workers have to more often switch their jobs they might be more often observed in the happy period when starting a new assignment.

*Third*, studies are based on different samples with regard to sample size, age, sex, and industry/occupation. Most of the samples include women and men but authors mostly do not report gender-stratified results. Three studies do report gender-stratified results on the association of TAW and job satisfaction but do not observe any clear gender-specific relation of TAW and job satisfaction (Busk et al., 2015; Green & Heywood, 2011; Jahn, 2015). However, several studies emphasise the importance of gender for the association of TAW, job satisfaction, and mental health (Green & Heywood, 2011; Jahn, 2015; Wooden & Warren, 2004) and stress gender-specific patterns in work-related attitudes and health (Ferrie, Shipley, Marmot, Stansfeld, & Smith, 1998; Kim, Khang, Muntaner, Chun, & Cho, 2008; Loutfi, 2001). Moreover, studies are based on different occupations and industries. Certainly, determinants of health inequalities in terms of pay and benefits, the socio-cultural environment at work, and working conditions are not

comparable between occupations and industries (Benach, Muntaner, Benavides, Amable, & Jodar, 2002; Tompa, Scott-Marshall, Dolinschi, Trevithick, & Bhattacharyya, 2007; Vahtera, Virtanen, Kivimäki, & Pentti, 1999). Thus, occupation- and industry-based patterns are further explanatory factors for mixed results concerning the health situation of temporary agency workers.

*Fourth*, differences in study results can at least partly be attributed to the varying inclusion of confounding variables. Several authors suggest that job satisfaction and the health situation of atypical employees are affected by work-related factors, in particular job insecurity and unfavourable working conditions, mediating the relationship between atypical employment forms, job satisfaction, and health (Benach et al., 2014; Benavides et al., 2006; Chambel & Farina, 2015; Ferrie, 2001; Waenerlund, Virtanen, & Hammarström, 2011). Atypical employment is strongly associated with job insecurity (Benach et al., 2014; P. Virtanen, Janlert, & Hammarström, 2011; P. Virtanen, Liukkonen, Vahtera, Kivimäki, & Koskenvuo, 2003) and with adverse working conditions such as low control, low social support, more repetitive tasks, and monotonous work (Benach et al., 2014; Eurofound, 2010; Schuring, van Oosten, & Burdorf, 2013). These working conditions (Benach, Benavides, Platt, Diez-Roux, & Muntaner, 2000; Kalleberg, 2000; Kalleberg, Reskin, & Hudson, 2000) as well as job insecurity (Cheng & Chan, 2008; Sverke, Hellgren, & Näswall, 2002) are associated with reduced job satisfaction and unfavourable mental health outcomes (M. Virtanen et al., 2005).

Differences in study results could furthermore occur due to unobserved potential confounding variables like, for instance, relation to supervisor (Forde & Slater, 2006; Siu, 2002), voluntariness of TAW (Ellingson, Gruys, & Sackett, 1998; Krausz, Brandwein, & Fox, 1995), organisational climate (Batlis, 1980; Ibarra & Andrews, 1993; Jyoti, 2013; Trombetta & Rogers, 1988), or personal traits (Judge, Heller, & Mount, 2002).

*Fifth* and finally, differences in study results can be explained by the selection and operationalisation of the applied outcome measures. Forde and Slater (2006) indicate that the operationalisation of the measured constructs affects the results on work-related attitudes including job satisfaction. In this context, De Graaf-Zijl (2012) shows that temporary agency workers have distinct job satisfaction structures, i.e. for them, wage satisfaction receives a lower weight than it does among regular workers. In contrast, further job aspects like social relations with co-workers, career opportunities, and resource adequacy are more important than for permanent employees (De Graaf-Zijl, 2012). Therefore, deliberately differentiating between job satisfaction structures could lead to more unambiguous results.

The included studies furthermore suggest that mixed findings may at least partly stem from varying operationalizations of stress. The three studies revealing statistically significant associations of TAW and stress used a one-item measure of stress, while the only non-significant study used the occupational stress measure typically employed in research on the JDC-Model, in which stress is determined by high job demands and low decision latitude (R. Karasek et al., 1998). Lemanski (2012) confirms that TAW often goes along with low decision latitude. However, temporary agency work is not invariably characterised by high demands, but may in fact sometimes also be characterised by low demands. In such cases, temporary agency work does not represent a “high strain job” but a “passive job” (Lemanski, 2012). Thus, the JDC-specific operationalisation may contribute to the observed non-significant effect.

To conclude, the inconsistent findings in our review probably result from diverse social and work realities in different countries as well as from limitations in study designs and in operationalizations of outcome measures. These limitations prevent us from deducing clear conclusions regarding the associations between TAW, job satisfaction, and mental health. Consequently, in the remainder of this article, we will develop a research agenda for future investigations on TAW and job satisfaction as well as mental health outcomes. In general, our systematic review reveals that the association of TAW, job satisfaction and especially various indicators of mental health is currently not well understood and more research is needed. To improve this state, we suggest that various methodological aspects should be considered with regard to (i) the applied theoretical frameworks, (ii) a standard measurement of TAW, (iii) a minimum of meaningful confounding variables, (iv) the operationalisation of outcome variables, (v) the study design, and (vi) comparison standards.

#### 4.4. Research agenda

A *first* suggestion for the improvement of further research refers to theoretical approaches on the psychological and health impact of TAW. The included studies predominantly use segmentation, stress, social exchange, and social comparison theories, which are approved theoretical approaches in explaining attitudes and well-being of permanent employees (De Cuyper et al., 2007). However, the overall rather inconclusive results raise the question whether new theoretical approaches need to be developed to better describe the mechanism how TAW potentially impacts job satisfaction and mental health.

The employment-strain model (Clarke, Lewchuk, de Wolff, & Kind, 2007) and the Pressures, Disorganization, and Regulatory Failure (PDR) model (Quinlan & Bohle, 2004, 2009) represent important theoretical further developments in this context. However, these models have so far been used predominantly in studies in the American and Australian context to explain the greater OHS vulnerability of precarious workers. Both models take into account different specific conditions and consequences of atypical employment like regulation of employment and unemployment periods, gaps in employment protection or poor supervision at work (Quinlan, 2013; Underhill & Quinlan, 2011). Different studies each focusing on a specific form of atypical employment – including temporary agency work – show that the factors described in the two models contribute to the explanation of the health situation of atypical employees (Bohle, Harold, Quinlan, & McNamara, 2011; Lewchuk, Clarke, & de Wolff, 2008; McNamara, 2009; Underhill & Quinlan, 2011). The integration of these models into the research of TAW in the European context may help to further develop theorising on TAW in Europe. As these models have been developed for the analysis of atypical employment in its broadest sense, TAW-specific characteristics are currently partially neglected. Therefore, in future theoretical approaches, TAW-specific factors (e.g. quality of the tripartite collaboration of temporary work workers, their agency, and the user company or given legal regulations), the temporary agency workers' individual characteristics (e.g. employment/life history, occupational preferences or motives) as well as resources and demands outside of work (e.g. employment status of the partners of temporary agency workers, care duties for family members or specific financial burdens) should be taken into account when building theory about the impacts of TAW.

*Second*, an appropriate operationalisation and examination of TAW in future studies is essential. Notwithstanding that De Cuyper et al. (2009) and Wagenaar et al. (2012) have already suggested to separately analyse the various forms of temporary work, many studies jointly examine temporary agency workers and employees on fixed-term contracts (e.g. Lee, 2013; Tuisku, Houni, Seppanen, & Virtanen, 2016). As existing studies have shown, these groups differ in factors that influence satisfaction and health such as socio-demographic characteristics and working conditions (De Graaf-Zijl, 2012; Silla et al., 2005). In the future, it is necessary to investigate these groups separately. In addition, more studies from the same national background are needed to analyse the impact of TAW depending on national regulations. Furthermore, in studies with the same national background, a standard measurement of TAW is important (i.e. a standard set of questionnaire items tapping into, for instance, employment contract, contract duration, and occupational status). Besides, future international studies should pay specific attention to the national definitions and national regulations of TAW.

*Third*, future research should establish the comparability of studies with regard to potential confounding variables. A major drawback of existing studies is that most of them do not explicitly account for important confounders like gender, age, voluntariness of TAW, or private situation. Future studies should – at least – include the mentioned confounding variables to allow for subgroup analyses and to identify group-specific patterns in satisfaction and health. Furthermore, a greater number of industry-/occupation-specific studies is needed to detect whether the effects on job satisfaction and mental health are industry-/occupation-specific. In particular, the knowledge about the relationships between TAW, job satisfaction, and mental health can be enhanced when the work design and the resulting working conditions of temporary agency workers are studied. Our review provides initial evidence that job insecurity and unfavourable working conditions as results of poor work design may be important factors for job satisfaction. It is desirable that future studies are aware of this finding and consider these constructs.

*Fourth*, our review uncovers the necessity to improve the selection and operationalisation of outcome variables. More studies are needed that use standardised multi- rather than one-item measures to obtain a greater number of comparable studies using psychometrically sound instruments.

*Fifth*, we recommend study design modifications. Our review of extant studies investigating the associations between TAW, job satisfaction, and mental health reveals the need for systematic longitudinal studies to identify occupational careers of temporary agency workers and potential mechanisms underlying the relation of TAW and mental health. From a life-course perspective (Elder & Giele, 2009; Wadsworth, 1997), it is necessary to analyse the whole life course or at least critical work-related phases of the life course of temporary agency workers and to examine accumulations of potential risk factors to identify constellations, in which TAW is a health risk. Moreover, longitudinal designs should be combined with dropout analyses to identify if the dropout of survey participants is systematically associated with individual or structural characteristics (e.g. sex, age, sector, unemployment rate, etc.) of temporary agency workers. Additionally, scholars should be aware of the honeymoon-effect (Boswell et al., 2005) and critically think about suitable points in time for their observations. Another important modification refers to the combination of data from different sources to avoid common method biases, e.g. self-reports on the employment status

on the one hand and psychological or psychiatric diagnoses or physiological data on the other hand (Podsakoff et al., 2003).

A *sixth* and last suggestion for the improvement of further research refers to employed comparison standards: Comparisons between temporary workers and unemployed persons would be useful in addition to the comparison with permanent employees. This is of high relevance because a high proportion of temporary agency workers are recruited from the unemployed. This reference group could, thus, reveal interesting insights above and beyond permanent employees as the hitherto standard reference group.

## 5. Conclusion and practical implications

This systematic review shows first that TAW is not consistently related to low job satisfaction. However, in studies confirming this relation, job insecurity and working conditions appear to mediate this relation. Second, TAW is not consistently related to mental health impairments. However, when focusing on specific outcomes and comparing temporary agency workers to permanent employees, we still find consistent evidence for instance regarding higher levels of depression as well as predominant evidence regarding higher fatigue among temporary agency workers. Third, we derive from this review that future research should consider new ways of theorising about TAW, a standard measurement of TAW, a minimum of meaningful confounding variables, a better operationalisation of outcome variables, improved study designs, and meaningful comparison groups to investigate the relationships between TAW, job satisfaction, and mental health more conclusively.

The findings of our review have also practical implications as they underline the effects of job quality on job satisfaction of temporary agency workers. Due to the tripartite employment relationship of TAW, these implications should concern user companies as well as temporary work agencies. We first recommend that organisations design the jobs of temporary agency workers along well-known beneficial aspects of work like (social) integration in the organisation, clear communication or specific training programmes for personnel development. Second, working conditions of temporary agency workers should not differ from those of permanent employed staff in user companies to improve perceived fairness among temporary agency workers. The adverse effect of job insecurity could be alleviated by avoiding gaps in workers' assignments and increasing their chances of follow-up contracts. These and related measures for improving job quality and working conditions can have positive effects on job satisfaction – and potentially also on mental health – of temporary agency workers.

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