

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Measuring precarious employment in Sweden: Translation, adaptation and psychometric properties of the Employment Precariousness Scale (EPRES)
AUTHORS	Jonsson, Johanna; Vives, Alejandra; Benach, Joan; Kjellberg, Katarina; Selander, Jenny; Johansson, Gun; Bodin, Theo

VERSION 1 - REVIEW

REVIEWER	Pasi Pyöriä Tampere University, Finland
REVIEW RETURNED	19-Feb-2019

GENERAL COMMENTS	<p>This is a good and clearly written paper. I have a few comments, though.</p> <p>1. In the Introduction, the authors state that "there has been a shift from standard contracts (i.e., open-ended full-time contracts) towards more atypical and flexible contracts such as part-time work, temporary work, temporary agency work, zero hour contracts, "gig" work arrangements and self-employment". The evidence, however, is not unequivocal. According to Eurofound (2017a; 2017b), There had been previously a significant increase in the temporary employment rate, particularly since the late 1980s. This occurred, for example, in France and Spain between 1985 and 1995, Sweden in the early 1990s and Germany in the early 2000s. However, in the last decade, there has been no upward trend in the rate of temporary contracts overall in the European Union; indeed, there was a slight decline from 14.5% in 2006 to 14.2% in 2016.</p> <p>Eurofound (2017a) Aspects of non-standard employment in Europe.</p> <p>Eurofound (2017b) Non-standard forms of employment: Recent trends and future prospects.</p> <p>2. On page 7, the authors state that "Around 10% of the employees in Sweden are not covered by collective bargaining agreements and around 9% have multiple jobs. The latter has seen an increase with 1.5% since 2005." In the latter case, are we talking about an increase of 1.5 per cent or 1.5 percentage points? Please check.</p> <p>3. Based on Table 1, I reckon that voluntary part-time workers are excluded from the precariat. Please clarify this in the main text.</p>
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	<p>4. I am aware that there are strong arguments according to which work has become more precarious than before (e.g. Kalleberg, 2018).</p> <p>Kalleberg, A.L. (2018) Precarious Lives: Job insecurity and well-being in rich democracies. Cambridge: Polity Press.</p> <p>However, empirical evidence remains inconclusive due to the lack of studies assessing changes over time. For critical accounts, see for example:</p> <p>Doogan, K. (2015) Precarity – Minority condition or majority experience? In della Porta, D., Hänninen, S., Siisiäinen, M. and Silvasti, T. (eds) The New Social Division: Making and Unmaking Precariousness. London: Palgrave MacMillan, pp. 43–62.</p> <p>Fevre, R. (2007) Employment insecurity and social theory: The power of nightmares. <i>Work, Employment and Society</i> 21(3): 517–535.</p> <p>Pyöriä, P. and Ojala, S. (2016) Precarious work and intrinsic job quality: Evidence from Finland, 1984–2013. <i>Economic and Labour Relations Review</i> 27(3): 349–367.</p>
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REVIEWER	Ingrid Esser Swedish Institute for Social Research, Stockholm University, Sweden
REVIEW RETURNED	23-Apr-2019

GENERAL COMMENTS	<p>Yes: no major re-runs of data, except verification of no bias due to small n:s as noted in review.</p> <p>This study provides an interesting and timely development and improvement of previous operationalization for measuring precarious employment in Spain so as to suit the Swedish labour market. It repeats and develops the previous questionnaire and empirical assessment to provide a multidimensional measurement of several distinct central dimensions of precarious employment in Sweden. With international labour markets undergoing fundamental transition, the development of internationally comparable definitions and measures is timely and necessary so as to improve our understanding, not only about changing work conditions, but also to develop proper measurement of precarious employment that may be used in studies of working condition outcomes, such as workrelated health, well-being and stress. The purpose of assessing multiple central dimensions is an important improvement, where each dimension may contribute substantially to perceived precariousness and job insecurity and poor work-related health and well-being. The methodological assessment seems overall both systematic and sufficiently robust.</p> <p>For this reason, I recommend the publication of this study. A published version would benefit greatly from updates concerning mainly framing of the study, clarifications on previous research, aim and scope.</p> <p>Much of comments are based on the understanding that this study is an attempt to create more precise and internationally comparative measures of precarious employment. If this is a misperception, an overall comment would be to clearly state this early on and/or else</p>
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elaborate the text with this specification in mind.

1. In the introduction the authors state how there is yet no single (international) definition of precarious employment. Yet, national and international comparisons of precarious employment are ample, wherefore it would be beneficial to review in somewhat more detail at least a few state-of-the-art examples of existing international definitions and operationalisations, and preferably how they draw on international comparative data.

In this context, it seems an implicit, if not explicit, aim of this study to provide a more precise definition of precarious employment so as to improve international comparability. If this is the case, how is the adjustment to a specific national context (Swedish) warranted? Would adjustments of the Spanish “tool” not benefit from an aim to also suit international/European comparison? There is also an issue of representativity not discussed in much length, although briefly mentioned in the conclusion. In relation to how the sampling procedure is non-random/not representative and skewed even for Swedish precariously employed persons, it seems to be of central importance to state more clearly and discuss the limitation of this study, especially if the aim is to improve internationally comparable measures of precarious employment.

Would it be possible to clarify how this study compares to previous Swedish studies of precarious employment?

Could authors clarify if there is an implicit suggestion so as to include the proposed measurements (currently in a pilot-study format) in other comparative data or is the questionnaire to be received as an independent research tool given its encompassing and complex format?

The empirical analyses verify distinct dimensions of precarious employment. Each aspect is empirically found to be distinct and theoretically motivated as central and important. Would it be possible to include a short discussion about the relative importance of these dimensions, possibly relating to previous measurements/definitions of precarious employment. E.g. from research on work values and preferences, it is known how individuals universally and strongly value job security over and above several other central value dimensions. Could authors comment on the possible weighting of sub-scales of precarious employment, especially if an aim would be the construction of an overall index measure of precarious employment?

Could authors comment on how a sub-scale/one/few dimensions of the current study compares to existing measures of precarious employment? Would such comparability possibly “transfer” some of the comparability of other dimensions? This would even further strengthen the importance of exiting study.

2. For international comparison, it seems also central to mention/discuss/comment on the relativity of precarious employment in relation “regular employment”, which may be nearly equally precarious in some countries. This is noted quite briefly in the conclusion. E.g. in Sweden, some dimensions of precariousness may differ more between regular and temporary/precarious employment. But in other countries with lax overall labour market legislation (low scores on both regular and temporary EPL-measures), differences between regular and temporary employment

	<p>may be quite small.</p> <p>3. For comparative purposes of the sub-scale “rights” it would be central to include note/discussion about the sometimes large differences between “rights to benefits” as such, and what quality of rights are actually available (generosity in levels, duration etc.). Several countries provide (at least) two tier security arrangements in relation to how central/peripheral position an employee holds in the labour market.</p> <p>4. Given the gendered nature of labour markets, it is surprising the gender differences or relevance is not discussed at any length. Could authors say something in short on how operationalization is applicable to male and female precarious occupations alike?</p> <p>5. Could the arguments concerning self-employed persons “precariousness” be elaborated, substantiating the choice of excluding voluntarily self-employed in the study (p.10).</p> <p>6. Please clarify what “weighted” analyses imply (p. 12).</p> <p>7. In a few cases the very small n:s lead to suspecting weak reliability of sub-scales and measurements. Could the authors comment about cautions in this respect?</p>
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REVIEWER	Daniel Kopasker Health Economics Research Unit University of Aberdeen UK
REVIEW RETURNED	03-May-2019

GENERAL COMMENTS	<p>Ref: bmjopen-2019-029577</p> <p>Title: Measuring precarious employment in Sweden: Translation, adaptation and psychometric properties of the Employment Precariousness Scale (EPRES)</p> <p>Journal: BMJ Open</p> <p>Comments to author:</p> <p>This paper reports an initial attempt to construct a multidimensional index of precarious employment for Sweden. The index is based on the existing Employment Precariousness Scale (EPRES), which was originally written in Spanish. The authors take care to translate the question wording to Swedish (and English) and make a number of adjustments to account for the Swedish labour market context. Appropriate statistical analysis is competently conducted to evaluate the factor structure of the Swedish Employment Precariousness Scale (EPRES-Se). However, due to a bias introduced by selecting a sample of only individuals in non-standard employment, the paper is unable to determine if EPRES-Se can reliably identify precarious employment throughout the working population of Sweden. Furthermore, although the paper is motivated by an assertion that such an index is needed to understand the health consequences of precarious employment, and information on health outcomes appears to be available within the Swedish dataset, no attempt is made to investigate the usefulness of EPRES-Se in a health setting.</p>
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It would seem that the authors would be best placed to address the sample selection issues and develop the next iteration of EPRES-Se. Assuming this is not possible, a number of changes could be made to this paper to provide a foundation for other researchers to complete this worthwhile exercise:

1. The motivation and objective for the paper could be strengthened by simplification. The introduction states that evidence of the health consequences of precarious employment is limited due to a lack of a measurement instrument. This appears to disregard around 25 years of high-quality research on the health consequences of insecure employment, particularly from the Whitehall II study. Although precarious employment is not synonymous with insecure employment, the research remains relevant and is not overly limited by the lack of a measurement instrument. However, cross-country analysis of this issue remains scarce, in part due to the lack of a consistent measurement instrument. A scale of precarious employment would be useful in many settings and would enable reliable cross-country comparative policy evaluation.

I would suggest that the aim stated on page 7, rather than the objective on page 2, is more closely aligned to what paper actually does and this could be motivated by the need to enable cross-country analysis. Especially since the discussion of precarious employment in Sweden (from page 6) suggests that it would be possible to analyse health consequences without EPRES-Se.

2. Greater detail is needed regarding the basis for making adaptations to EPRES-2010 (from page 11) and these should not assume a detailed knowledge of the development of EPRES-2010. This section does a good job of documenting the adaptations, but the reader cannot make a judgement on the appropriateness of the changes without a clear and detailed justification being provided. A number of the changes suggest issues with EPRES-2010, rather than Sweden specific issues.

3. Further explanation of the sample selection issue is required. Why were only non-standard employees selected, what are the consequences of this, and what would an ideal sample look like? It would also be useful to explain the further exclusions. Currently, "suspected deception" sounds rather arbitrary.

4. For a researcher to address the issues with EPRES-Se the section on "Temporariness" from page 21 is key. At present it is poorly written and difficult to follow. There must be clarity regarding each issue being referred to, an informed opinion of why this may have occurred, and a suggested solution. The statistical issues reported are symptoms of problems, not reasons for the problems.

REVIEWER	Chris L Peterson La Trobe University Australia
REVIEW RETURNED	05-May-2019

GENERAL COMMENTS	<p>The authors argue that knowledge of the extent of precarious employment and its health effects are limited due to not having a comprehensive measurement tool. They have adapted the Spanish Employment Precariousness Scale for use in Sweden and tested its psychometric properties. They found with some minor limitations it is useful in the Swedish context. I found this an interesting paper that was clearly presented.</p> <p>The introduction/background provides a rationale for testing the Spanish instrument, but there were some areas that could have been argued more forcefully.</p> <p>Page 4 In the early stages of the paper it is argued that in developed countries precarious employment is now becoming rife. However Quinlan, Mayhew and Bohle (2001) in their assessment of global expansion of precarious employment (International Journal of Health Services) argue then that internationally precarious employment was already becoming a significant problem in some developed countries. The development of neoliberal policies was seen as a major cause of precarious employment. Could the authors comment on this.</p> <p>In terms of deteriorating labour conditions there has been a rise in part time and underemployment in many developed countries. Could the authors provide a brief comment on the emergence of these trends and how the effects of neoliberalism and inequity can have significant costs to countries.</p> <p>Page 7 There was a good discussion of changes in the Swedish labour market as it relates to precariousness.</p> <p>Stress literature has shown that there are significant health effects from job insecurity and from having little control at work. Could the authors comment further on health effects of precarious employment, given that as the authors point out Sweden may have stronger employment policies than in many other countries.</p> <p>Overall I felt that there could have been a stronger discussion of the health effects of precarious employment and of the effects of inequity, given what is known from work stress and related research.</p> <p>The methodology was sound and there was a comprehensive approach taken with the translation of the Spanish version of the questionnaire. Testing of the psychometric properties of the adapted Swedish version of the scale was well presented. I have two particular issues.</p> <p>Firstly can the authors provide a rationale for using a Varimax rotation?' Could they comment on whether other rotation methods were used to investigate a stronger solution given the problems with 'temporariness'.</p> <p>In addition, 'temporariness' is an important concept. The authors rightly argue it is too weak to be sustained and they explore the</p>
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	possibility of a two factor solution to the problem, which may have been a solution. They then provide arguments for developing new items related to the concept. I found they provided an effective discussion of how to move forward.
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Pasi Pyöriä

Institution and Country: Tampere University, Finland

Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below

This is a good and clearly written paper. I have a few comments, though.

Thank you for your positive feedback and for all your valuable comments - greatly appreciated.

1. In the Introduction, the authors state that "there has been a shift from standard contracts (i.e., open-ended full-time contracts) towards more atypical and flexible contracts such as part-time work, temporary work, temporary agency work, zero hour contracts, "gig" work arrangements and self-employment". The evidence, however, is not unequivocal. According to Eurofound (2017a; 2017b), There had been previously a significant increase in the temporary employment rate, particularly since the late 1980s. This occurred, for example, in France and Spain between 1985 and 1995, Sweden in the early 1990s and Germany in the early 2000s. However, in the last decade, there has been no upward trend in the rate of temporary contracts overall in the European Union; indeed, there was a slight decline from 14.5% in 2006 to 14.2% in 2016.

Eurofound (2017a) Aspects of non-standard employment in Europe.

Eurofound (2017b) Non-standard forms of employment: Recent trends and future prospects.

Thank you for this feedback and suggested literature. I realize that the fact that there has been no upward trend in the proportion of temporary employment in the recent decades (since the 1990's in Sweden) was not made as clear as intended. I have clarified this and also included Eurofund 2017b as a reference in order to strengthen the statement. You can find this update on page 6

P 6: "The proportion of temporary employees has been stable around 15-17% since the late 1990's (37, 38)."

2. On page 7, the authors state that "Around 10% of the employees in Sweden are not covered by collective bargaining agreements and around 9% have multiple jobs. The latter has seen an increase with 1.5% since 2005." In the latter case, are we talking about an increase of 1.5 per cent or 1.5 percentage points? Please check.

Thank you, the correct statement reads 1.5 percentage points. This has been updated in the text on page 7.

P 7: "The latter has seen an increase with 1.5 percentage points since 2005 (39)."

3. Based on Table 1, I reckon that voluntary part-time workers are excluded from the precariat. Please clarify this in the main text.

Yes, you are correct. As one of the objectives with the PREMIS-project was to sample a population of only precarious employees – in this case defined as a group of non-standard employees considered at risk of precarious employment conditions – voluntary part-time employees were excluded (as were voluntary self-employed). I have clarified this in the main text on page 9 and 10.

P 9: "PREMIS aims at methodological development in terms of sampling strategies and assessment of precarious employment, as well as at studying health outcomes of precarious employment."

P 10: "As one of the aims of PREMIS was to sample precarious employees with webRDS, a process which has been described elsewhere (43), participation in the study was restricted to individuals considered particularly vulnerable to precarious employment conditions, such as individuals with temporary employment, on-demand employment, involuntary part-time employment and involuntary self-employment."

4. I am aware that there are strong arguments according to which work has become more precarious than before (e.g. Kalleberg, 2018).

Kalleberg, A.L. (2018) *Precarious Lives: Job insecurity and well-being in rich democracies*. Cambridge: Polity Press.

However, empirical evidence remains inconclusive due to the lack of studies assessing changes over time. For critical accounts, see for example:

Doogan, K. (2015) Precarity – Minority condition or majority experience? In della Porta, D., Hänninen, S., Siisiäinen, M. and Silvasti, T. (eds) *The New Social Division: Making and Unmaking Precariousness*. London: Palgrave MacMillan, pp. 43–62.

Fevre, R. (2007) Employment insecurity and social theory: The power of nightmares. *Work, Employment and Society* 21(3): 517–535.

Pyöriä, P. and Ojala, S. (2016) Precarious work and intrinsic job quality: Evidence from Finland, 1984–2013. *Economic and Labour Relations Review* 27(3): 349–367.

Thank you for this comments and the suggested literature. I have included Pyöriä, P. and Ojala, S and updated the text on page 7.

P7: “Thereby, despite the stable levels of temporary employment in Sweden, it could be assumed that the level of precariousness has increased on the Swedish labour market. A study from Finland, however, indicate that the precariat (as defined by atypical employment, previous unemployment, fear of job-loss, poor prospects of employment and low earnings) has not seen an increase the past couple of decades (40). Without longitudinal studies assessing changes in precarious employment over time, evidence in Sweden remains inconclusive.”

Due to your feedback in this comment and in comment 1, parts of the section “Precarious employment in Sweden” has been restructured in order to give a clearer picture of the situation in Sweden.

Reviewer: 2

Reviewer Name: Ingrid Esser

Institution and Country: Swedish Institute for Social Research, Stockholm University, Sweden

Please state any competing interests or state ‘None declared’: None declared

Please leave your comments for the authors below

Yes: no major re-runs of data, except verification of no bias due to small n:s as noted in review.

Thank you for your review. We assume, however, that this comment was not intended for us to base revisions on, as indicated by its short and uncontextualized nature. We have therefore not been able to change anything in the manuscript based on this comment.

Reviewer: 3

Reviewer Name: Daniel Kopasker

Institution and Country: Health Economics Research Unit

University of Aberdeen, UK

Please state any competing interests or state 'None declared': None declared.

Please leave your comments for the authors below

Ref: bmjopen-2019-029577

Title: Measuring precarious employment in Sweden: Translation, adaptation and psychometric properties of the Employment Precariousness Scale (EPRES)

Journal: BMJ Open

Comments to author:

This paper reports an initial attempt to construct a multidimensional index of precarious employment for Sweden. The index is based on the existing Employment Precariousness Scale (EPRES), which was originally written in Spanish. The authors take care to translate the question wording to Swedish (and English) and make a number of adjustments to account for the Swedish labour market context. Appropriate statistical analysis is competently conducted to evaluate the factor structure of the Swedish Employment Precariousness Scale (EPRES-Se). However, due to a bias introduced by selecting a sample of only individuals in non-standard employment, the paper is unable to determine if EPRES-Se can reliably identify precarious employment throughout the working population of Sweden. Furthermore, although the paper is motivated by an assertion that such an index is needed to understand the health consequences of precarious employment, and information on health outcomes appears to be available within the Swedish dataset, no attempt is made to investigate the usefulness of EPRES-Se in a health setting.

It would seem that the authors would be best placed to address the sample selection issues and develop the next iteration of EPRES-Se. Assuming this is not possible, a number of changes could be made to this paper to provide a foundation for other researchers to complete this worthwhile exercise.

Thank you for your feedback and insightful comments. I will provide a response to each of your comments below.

1. The motivation and objective for the paper could be strengthened by simplification. The introduction states that evidence of the health consequences of precarious employment is limited due to a lack of a measurement instrument. This appears to disregard around 25 years of high-quality research on the health consequences of insecure employment, particularly from the Whitehall II study. Although precarious employment is not synonymous with insecure employment, the research remains relevant and is not overly limited by the lack of a measurement instrument. However, cross-country analysis of this issue remains scarce, in part due to the lack of a consistent measurement instrument. A scale of precarious employment would be useful in many settings and would enable reliable cross-country comparative policy evaluation.

I would suggest that the aim stated on page 7, rather than the objective on page 2, is more closely aligned to what paper actually does and this could be motivated by the need to enable cross-country analysis. Especially since the discussion of precarious employment in Sweden (from page 6) suggests that it would be possible to analyse health consequences without EPRES-Se.

Thank you for this comment. Despite the fact that insecure employment have features in common with precarious employment, it is – as you mention – not synonymous with precarious employment. In an effort to 1) avoid using the concepts interchangeably and 2) keep the focus on the EPRES-Se and its psychometric properties, inclusion of insecure employment conditions and their health effects, as well as health outcomes of precarious employment, was intentionally kept to a bare minimum. We have, however, reconsidered slightly and included a short section of health outcomes (with a brief mention of job insecurity), considering that one of the primary aims with a Swedish validated EPRES-scale is to be able to estimate health outcomes of precarious employment. You can find this updated section on page 5.

P 5: “By the means of a cross-national multidimensional definition and measurement instrument of precarious employment, comparative and more precise estimations of health effects are made possible. Previously, PE has been linked to an array of health issues including mental and physical health (2, 27) and occupational injuries (28). Previous research on related concepts such as job insecurity and temporary employment also show consistent associations with various health outcomes (29-32). Mechanisms linking precarious employment and health are not yet fully understood but pathways that have been suggested include more harmful working conditions, limited control over one’s professional and personal lives, feelings of insecurity and incomes below the subsistence level, which consequently can affect other social determinants of health such as housing quality, lifestyles and so on (33).”

Furthermore, you are completely right in the fact that there was too little emphasis on cross-country comparisons in the manuscript, which of course is one of the primary aims with this work. Revisions have therefore been made on page 2 and page 7.

P 2: “This lack also brings about challenges in terms of capturing the size of the population in precarious employment, conducting occupational health and safety surveillance (6, 7), as well as cross-country comparisons.”

P 7: “A translation and adaptation of EPRES to Swedish and the Swedish context is thus an important step in the direction to fully comprehend the distribution and trends of precarious employment in the Swedish population, as well as to allow for cross-country comparisons. Such an instrument would also enable well-needed studies on the health outcomes of precarious employment.”

2. Greater detail is needed regarding the basis for making adaptations to EPRES-2010 (from page 11) and these should not assume a detailed knowledge of the development of EPRES-2010. This section does a good job of documenting the adaptations, but the reader cannot make a

judgement on the appropriateness of the changes without a clear and detailed justification being provided. A number of the changes suggest issues with EPRES-2010, rather than Sweden specific issues.

Thank you for this feedback. Although a table comparing both the Spanish EPRES (in English) and the Swedish EPRES (in English) would have given the reader a better overview of the adaptations, we did not want to do the EPRES-2010 injustice by translating it to English without involvement of all of the original creators. This will have to be another paper. Therefore, attempts of clarifying the text have been made in places where rationale might have been lacking. You can find these updates on page 11 and page 12.

P 11: "The response alternatives in 'temporariness' were stated as categories, as opposed to free text values of number of days, months or years in EPRES-2010, in order to increase usability in the web-survey context. For the same reason, the question on contract duration which contained three dependent items in EPRES-2010, was collapsed into one question in EPRES-Se."

P 12: "In EPRES-2010, the two response alternatives capturing working conditions that were decided unilaterally by the employer, were merged into one response option in the Swedish adaptation in order to enhance usability."

P 12: "However, a new item assessing the right to sickness benefit was added in the subscale instead, capturing both long term sick leave and shorter spells of sickness absence."

3. Further explanation of the sample selection issue is required. Why were only non-standard employees selected, what are the consequences of this, and what would an ideal sample look like? It would also be useful to explain the further exclusions. Currently, "suspected deception" sounds rather arbitrary.

Thank you for stressing this issue. Clarifications and expansions have been made in several sections in the method and discussion. Updates can be found on page 9, page 10, page 19 and page 23.

P 9: "PREMIS aims at methodological development in terms of sampling strategies and assessment of precarious employment, as well as at studying health outcomes of precarious employment."

P 10: "As one of the aims of PREMIS was to sample precarious employees with webRDS, a process which has been described elsewhere (43), participation in the study was restricted to individuals considered particularly vulnerable to precarious employment conditions, such as individuals with temporary employment, on-demand employment, involuntary part-time employment and involuntary self-employment."

P 10: "Out of the 483 participants included in the sample, 68 participants were excluded due to not matching criteria of county (n=6), re-using or giving an incorrect personal number (n = 8 and n=17,

respectively), being underage ($n = 1$) or suspected cheating (i.e., systematic repeated participation; $n=36$), giving a final sample of 415 participants.“

P 19: “Firstly, it is important to acknowledge the sample selection. As the sample was restricted to non-standard employees (i.e., permanent, full-time, employees were excluded), the lower end of the precariousness scale had a smaller proportion than what would be expected if standard employees with longer duration and tenure would have been included in the sample. This limitation is likely to have contributed to the lack of correlation between the items. However, considering that the sample was intentionally recruited in order to capture a population of precariously employed individuals, the poor psychometric properties of temporariness also shows that these items are not necessarily related in a meaningful way when measuring precariousness among non-standard employees.”

P 23: “The main limitation is the sample. As this study lies within the frame of the PREMIS-project (43), the sample was restricted to employees with a non-standard employment. EPRES, however, is developed to measure precariousness independent of the type of employment (8). By only assessing the psychometric properties of the scale in a population of non-standard employees, the scale properties cannot be directly compared to similar studies as the heterogeneity of the sample is limited. A sample representative of the entire work force would have provided better insights as to how the scale behaves among Swedish employees. A next step which this study has provided strong grounds for.”

4. For a researcher to address the issues with EPRES-See the section on “Temporariness” from page 21 is key. At present it is poorly written and difficult to follow. There must be clarity regarding each issue being referred to, an informed opinion of why this may have occurred, and a suggested solution. The statistical issues reported are symptoms of problems, not reasons for the problems.

Thank you. This section has been rewritten in order to be more clearly express our reasoning around temporariness. The updated section can be found on page 19-20.

P 19: “As opposed to previous studies, (8-10), temporariness yielded very poor psychometric properties. The items in the subscale did not correlate, there was a negative Cronbach’s alpha coefficient and a low factor loading for the item on contract duration. Only minor changes in terms of correlation and Cronbach’s alpha was initiated by the removal of informal workers and self-employed. This subanalysis did, however, split the temporariness dimension in two separate factors, both of which had higher factor loadings. On the basis of these results, we believe that the temporariness dimension needs further development and evaluation in a population of both standard and non-standard employees. Based on the results from the present study, we offer the following thoughts on this matter:

Firstly, it is important to acknowledge the sample selection. As the sample was restricted to non-standard employees (i.e., permanent, full-time, employees were excluded), the lower end of the precariousness scale had a smaller proportion than what would be expected if standard employees with longer duration and tenure would have been included in the sample. This limitation is likely to have contributed to the lack of correlation between the items. However, considering that the sample was intentionally recruited in order to capture a population of precariously employed individuals, the

poor psychometric properties of temporariness also shows that these items are not necessarily related in a meaningful way when measuring precariousness among non-standard employees.

Secondly, In the current context, the Swedish legislation (the Employment Protection Act SFS 1982:80) prevents an employer to hire an employee for more than two years during a five-year period (consecutive or in shorter repeated contracts) without having to employ (or dismiss) the employee in a permanent contract (46). Thereby, an employee with an 18-month tenure might be more precarious than an employee with a 6-month tenure as the latter has longer time left before being forced in or out. Further, approximately 50% of temporary employees in Sweden has had repeated contracts with the same employer (37), which is an additional reason that could contribute to the lack of correlation between tenure and duration of contract.

Thirdly, we found that several participants were employed by the hour or on demand while still indicating an indefinite contract length. This highlights the difficulties in assessing temporariness only by contract duration (and tenure). Temporariness is the dimension most likely to be dependent on context. Given the proposed mechanism of temporariness leading to ill-health mediated via feelings of insecurity, temporariness is most relevant in labour markets which do not offer regulatory protection for certain groups of workers, such as permanent employees in most European countries, which does not apply to the same extent in the USA (47).

However tempting it would be to suggest the inclusion of questions regarding “contract type” in a future development of EPRES, the continuous flexibilization of the labour market and fast changes in employment practices in combination with contextual differences, makes it increasingly difficult – at least if international comparison using similar scales is sought after.

From a mechanistic standpoint and with an aspiration to develop a scale which could be used in international comparison independent of context, we believe that an item that measures the future employment opportunities with the current employer as objectively as possible should be developed. EPRES-Se and other translations could further be adapted, for example by combining the contract duration and tenure-items with an item assessing the number of repeated contracts with the same employer or an item assessing how often during a specific time interval the employment contract is up for renewal. Contract duration could also be complemented or replaced by a question more explicitly assessing the remaining duration of the contract at the time of answering the survey.”

Reviewer: 4

Reviewer Name: Chris L Peterson

Institution and Country: La Trobe University, Australia

Please state any competing interests or state ‘None declared’: None declared

Please leave your comments for the authors below

The authors argue that knowledge of the extent of precarious employment and its health effects are limited due to not having a comprehensive measurement tool. They have adapted the Spanish Employment Precariousness Scale for use in Sweden and tested its psychometric properties. They

found with some minor limitations it is useful in the Swedish context. I found this an interesting paper that was clearly presented.

Thank you for your feedback, greatly appreciated.

The introduction/background provides a rationale for testing the Spanish instrument, but there were some areas that could have been argued more forcefully.

Page 4 In the early stages of the paper it is argued that in developed countries precarious employment is now becoming rife. However Quinlan, Mayhew and Bohle (2001) in their assessment of global expansion of precarious employment (International Journal of Health Services) argue then that internationally precarious employment was already becoming a significant problem in some developed countries. The development of neoliberal policies was seen as a major cause of precarious employment. Could the authors comment on this.

In terms of deteriorating labour conditions there has been a rise in part time and underemployment in many developed countries. Could the authors provide a brief comment on the emergence of these trends and how the effects of neoliberalism and inequity can have significant costs to countries.

Thank you for the suggested literature and for pointing out 1) our mistake in not incorporating neoliberalism in the paper as one of the (primary) drivers of precarious employment as we know it today and 2) our mistake in arguing that precarious employment is growing, although studies on trends of precarious employment is lacking, making the statement weak. Precarious employment is not a new phenomenon, as it was present both under the 19th and 20th century, although it has received more attention the last couple of decades due to changes in labour market conditions initiated by stronger unionization and influences of neoliberal ideas and policies. Neoliberal economies and ideas has speeded up globalization, trade competition and technological advancement, as well as it has decreased unionization and collective bargaining, thereby creating more uncertain and demanding contexts for workers in both developed and developing countries. So, by that said, I have made slight moderations to the initial sections of the paper. These can be found on page 3.

P 3: "Precarious employment (PE) is considered a social determinant of poor health and health inequality (1-3). PE is present in both developing as well as developed countries (4, 5)."

P 3: "During the past decades, neoliberal economics and policies together with increased globalization, trade competition, technological innovation and financial crises, has had a considerable impact on the dynamics of the labour market (5, 13, 14). These impacts have had several implications, including an increase in privatization, downsizing, outsourcing, a weakening of union input and collective regulation, and a more competitive and uncertain context for workers, with increases in flexible work, unemployment and non-standard employment arrangements (5, 13, 14). Furthermore, there has been a decline in attachment to employers, risk shifting from employer to employees, growth in perceived and actual job insecurity and work-based stress, as well as diminished bargaining power and rights (13, 14)."

Page 7 There was a good discussion of changes in the Swedish labour market as it relates to precariousness.

Thank you for the positive feedback.

Stress literature has shown that there are significant health effects from job insecurity and from having little control at work. Could the authors comment further on health effects of precarious employment, given that as the authors point out Sweden may have stronger employment policies than in many other countries.

I take the liberty of assuming that “stronger employment policies” refers to the employment protection act mentioned under “temporariness” in the discussion and its potential influence on the experience of precariousness of the employee. In this section, we discuss the influence of the Swedish context on the psychometric properties and adaptation to the EPRES-Se, as the paper does not directly relate to health outcomes of precarious employment. I did, however, include a short section on precarious employment and health outcomes in the introduction as well as a developed section in the discussion on temporariness.

Briefly, in the case of repeated temporary employment with an employer, it is likely that a longer temporary contract contributes more to stress and its related health effects, as we argue for precariousness, in comparison to shorter term contracts. Especially in economic sectors know for a large proportion temporary employees, where the likelihood of permanent employment after years of temporary employment, is less likely.

You can find the revisions on page 5 and page 20.

P 5: “Previously, PE has been linked to an array of health issues including mental and physical health (2, 27) and occupational injuries (28). Previous research on related concepts such as job insecurity and temporary employment also show consistent associations with various health outcomes (29-32). Mechanisms linking precarious employment and health are not yet fully understood but pathways that have been suggested include more harmful working conditions, limited control over one’s professional and personal lives, feelings of insecurity and incomes below the subsistence level, which consequently can affect other social determinants of health such as housing quality, lifestyles and so on (33).”

P 20: “Secondly, in the current context, the Swedish legislation (the Employment Protection Act SFS 1982:80) prevents an employer to hire an employee for more than two years during a five-year period (consecutive or in shorter repeated contracts) without having to employ (or dismiss) the employee in a permanent contract (46). Thereby, an employee with an 18-month tenure might be more precarious than an employee with a 6-month tenure as the latter has longer time left before being forced in or out. Further, approximately 50% of temporary employees in Sweden has had repeated contracts with the same employer (37), which is an additional reasons that could contribute to the lack of correlation between tenure and duration of contract.

Thirdly, we found that several participants were employed by the hour or on demand while still indicating an indefinite contract length. This highlights the difficulties in assessing temporariness only by contract duration (and tenure). Temporariness is the dimension most likely to be dependent on

context. Given the proposed mechanism of temporariness leading to ill-health mediated via feelings of insecurity, temporariness is most relevant in labour markets which do not offer regulatory protection for certain groups of workers, such as permanent employees in most European countries, which does not apply to the same extent in the USA (47).”

Overall I felt that there could have been a stronger discussion of the health effects of precarious employment and of the effects of inequity, given what is known from work stress and related research.

Thank you. Although we agree that the discussion on health effects of precarious employment is important and relevant, we intentionally held it to a minimum in order to keep the focus on the paper on EPRES-Se and its properties. To assess health outcomes by the means of the EPRES-Se is of course (one of) the ultimate goal, therefore I have included a short paragraph on health outcomes on page 5. This section is included in my answer above.

The methodology was sound and there was a comprehensive approach taken with the translation of the Spanish version of the questionnaire. Testing of the psychometric properties of the adapted Swedish version of the scale was well presented.

I have two particular issues.

Firstly can the authors provide a rationale for using a Varimax rotation?’ Could they comment on whether other rotation methods were used to investigate a stronger solution given the problems with ‘temporariness’.

Thank you for initiating this clarification. Varimax rotation was used in order to conduct analyses as similar to previous EPRES-papers. Therefore, other rotation methods were not explored in order to minimize going on a “fishing-expedition”. The reason as to why varimax rotation was used is added in the main text on page 10.

P 10: “Principal axis factoring, with varimax rotation, extracting eigenvalues >1 was used, which is the method used in previous EPRES-studies (8-10).”

In addition, ‘temporariness’ is an important concept. The authors rightly argue it is too weak to be sustained and they explore the possibility of a two factor solution to the problem, which may have been a solution. They then provide arguments for developing new items related to the concept. I found they provided an effective discussion of how to move forward.

Thank you for your positive feedback on this section. Due to a comment from another reviewer, the discussion on temporariness have been restructured in order to more clearly express our standpoints in the matter. You can find the revised section on page 19-20.

P 19: “As opposed to previous studies, (8-10), temporariness yielded very poor psychometric properties. The items in the subscale did not correlate, there was a negative Cronbach’s alpha coefficient and a low factor loading for the item on contract duration. Only minor changes in terms of

correlation and Cronbach's alpha was initiated by the removal of informal workers and self-employed. This subanalysis did, however, split the temporariness dimension in two separate factors, both of which had higher factor loadings. On the basis of these results, we believe that the temporariness dimension needs further development and evaluation in a population of both standard and non-standard employees. Based on the results from the present study, we offer the following thoughts on this matter:

Firstly, it is important to acknowledge the sample selection. As the sample was restricted to non-standard employees (i.e., permanent, full-time, employees were excluded), the lower end of the precariousness scale had a smaller proportion than what would be expected if standard employees with longer duration and tenure would have been included in the sample. This limitation is likely to have contributed to the lack of correlation between the items. However, considering that the sample was intentionally recruited in order to capture a population of precariously employed individuals, the poor psychometric properties of temporariness also shows that these items are not necessarily related in a meaningful way when measuring precariousness among non-standard employees.

Secondly, in the current context, the Swedish legislation (the Employment Protection Act SFS 1982:80) prevents an employer to hire an employee for more than two years during a five-year period (consecutive or in shorter repeated contracts) without having to employ (or dismiss) the employee in a permanent contract (46). Thereby, an employee with an 18-month tenure might be more precarious than an employee with a 6-month tenure as the latter has longer time left before being forced in or out. Further, approximately 50% of temporary employees in Sweden has had repeated contracts with the same employer (37), which is an additional reason that could contribute to the lack of correlation between tenure and duration of contract.

Thirdly, we found that several participants were employed by the hour or on demand while still indicating an indefinite contract length. This highlights the difficulties in assessing temporariness only by contract duration (and tenure). Temporariness is the dimension most likely to be dependent on context. Given the proposed mechanism of temporariness leading to ill-health mediated via feelings of insecurity, temporariness is most relevant in labour markets which do not offer regulatory protection for certain groups of workers, such as permanent employees in most European countries, which does not apply to the same extent in the USA (47).

However tempting it would be to suggest the inclusion of questions regarding "contract type" in a future development of EPRES, the continuous flexibilization of the labour market and fast changes in employment practices in combination with contextual differences, makes it increasingly difficult – at least if international comparison using similar scales is sought after.

From a mechanistic standpoint and with an aspiration to develop a scale which could be used in international comparison independent of context, we believe that an item that measures the future employment opportunities with the current employer as objectively as possible should be developed. EPRES-Se and other translations could further be adapted, for example by combining the contract duration and tenure-items with an item assessing the number of repeated contracts with the same employer or an item assessing how often during a specific time interval the employment contract is up for renewal. Contract duration could also be complemented or replaced by a question more explicitly assessing the remaining duration of the contract at the time of answering the survey."

VERSION 2 – REVIEW

REVIEWER	Daniel Kopasker Health Economics Research Unit University of Aberdeen UK
REVIEW RETURNED	17-Jul-2019

GENERAL COMMENTS	<p>The comprehensive responses to points raised by the reviewers are appreciated. The paper has been improved by the changes made, which seem appropriate in all cases. The influence of sample selection remains, but this issue has been adequately discussed within the paper. The paper now provides a solid foundation for development of EPRES-Se.</p> <p>A further check for typing errors is advised, particularly within the discussion. However, this is a very minor point and does not impact on the contribution of the paper.</p>
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REVIEWER	Chris I Peterson La Trobe University Australia
REVIEW RETURNED	30-Jun-2019

GENERAL COMMENTS	<p>Comments on revisions to the manuscript</p> <p>Changes to the abstract are fine.</p> <p>Under the following headings: Introduction – changes OK Precarious employment – changes good. Precarious employment in Sweden – many changes and these were OK. Implementation of the EPRES-Se – changes good. Statistical analyses – changes OK Patient and public involvement – Inclusions OK Results Adaptation of EPRES-Se – changes OK EPRES-Se – changes OK Psychometric properties of EPRES-Se – changes good Discussion Temporariness – Para 5 line 1 suggest rephrasing the 1st sentence. A lot of changes. The rest were good. Wages – changes OK Strengths and limitations – changes OK Conclusion – changes good.</p>
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