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## **Social innovation of work and employment**

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### *Abstract*

*Social innovation of work and employment is a prerequisite to achieve the EU2020 objectives of smart, sustainable and inclusive growth. It covers labour market innovation on societal level and workplace innovation on organisational level. This paper focuses on the latter. Workplace innovations are social both in their ends (quality of working life, well-being and development of talents together with organisational performance) and in their means (employee participation and empowerment). Complementary to technological innovations they regard innovations in social aspects of organisations such as work organisation, HRM and work relations. Workplace innovation – or innovative workplaces as it is sometimes called – deserves to be better incorporated in EU-policies, as also has been recommended by the European Economic and Social Committee and the OECD. Some countries have experienced the benefits of national campaigns already.*

### **1. Workplace innovation**

European economies are facing a period of economic crisis and there is a political urgency for continuous innovation and growth in productivity in order to realise sustainable growth and welfare provision within the European Union (EU). To achieve this aim, it is not sufficient just to introduce new technologies and seek competitive advantage by means of cutting costs. It will require the full utilisation of the potential workforce and creation of flexible work organisations. Recently, a number of European countries (e.g. Finland, Germany, Ireland, UK, Belgium, and The Netherlands) have started national programmes or initiatives to meet these challenges. These programmes are launched under the heading of 'Social Innovation' or 'Workplace Innovation'.

Social innovation is usually defined as ways of societal renewal in a broad sense with reference to societal issues ranging from social inequality to environmental pollution (e.g. Caulier-Grice et al. 2010; Howaldt/Schwarz 2010). It refers to socio-economic topics of various kinds. This paper, however, will focus on social innovation of work and employment. A distinction is made between societal level (labour market innovations and related social security and education

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issues) and organisational level (Table 1). The term used for renewal on organisational level is *workplace innovation*. Since no uniform definition of workplace innovation is at hand, the following work definition is proposed: *workplace innovations are strategically induced and participatory adopted changes in an organisation's practice of managing, organising and deploying human and non-human resources that lead to simultaneously improved organisational performance and improved quality of working life* (Eeckelaert et al. forthcoming). In this definition economic and social goals are combined. Other concepts cover more or less the same topics: 'innovative workplaces', 'sustainable work systems', 'high involvement workplaces' etc. In the concept of 'high performance workplaces' the objective of quality of working life is not always covered and the concept of 'non-technological innovation' focuses on organisational innovation, new business and marketing models without paying attention to quality of working life.

Workplace innovation includes aspects of management (absorption of external knowledge), flexible organisation, working smarter, continuous development of skills and competences, networking between organisations and the modernisation of labour relations (including human resource management) and industrial relations (Totterdill et al. 2009; Totterdill 2010; Pot 2011). Workplace innovation is regarded as complementary and conditional to technological innovation. Empirical findings suggest that technological innovation accounts for 25% of the success in radical innovation, whereas workplace innovation accounts for 75% (Volberda et al. 2006). Research indicates that through workplace innovation a simultaneous improvement in quality of working life and productivity is possible, in particular in projects with strong employee participation (Eurofound 2005; Ramstad 2009). The evidence of the convergence of organisational performance and quality of working life can be found in the following reviews of surveys and case studies: Eeckelaert et al. forthcoming; Koningsveld et al. 2005; Oeij et al. forthcoming; Totterdill et al. 2002 and 2009; Pot/Koningsveld 2009; Pot 2011; Vink et al. 2006; Westgaard/Winkel 2011.

## **2. Organisational performance and quality of working life**

Workplace innovation does not cover the whole range of occupational safety and health (OSH) topics, but it does include low stress risks, high job autonomy, lower physical workload, continuous development of competences, better labour relations (Pot/Koningsveld 2009; Ramstad 2009; Westgaard/Winkel 2011; Oeij et al. forthcoming). This can be called 'quality of working life' (QWL) and its effect on individual level is well-being. There is a need for more research to develop this association. The systematic review of Westgaard and Winkel (2011) is the first to give an overview of the possible relationship between workplace innovation and OSH topics. The rationalisation strategy, High Performance Work System (HPWS), was associated with the highest fraction of positive studies. Worker participation, resonant management style, information, support, group autonomy and procedural justice were modifiers with favourable influence on OSH outcomes. The main advantage of this assumption is that it might help companies to not solely see QWL as a cost factor, but also as a strategic benefit. In the Community Strategy for OSH 2007 – 2012 'improving quality and productivity at work' are mentioned. However, productivity in this document relates primarily to the costs of absenteeism.

How can the theoretical coherence of QWL, innovation and performance be understood? Individual and group performance is not directly the result of employee satisfaction or motivation, but through the involvement and commitment of workers' representation, HRM practices and work organisation (Judge et al. 2001; Taris et al. 2008). For instance, organisational commitment can be brought about by an organisational design that provides job autonomy, possibilities of consulting others, learning opportunities etc. (Karasek/Theorell 1990). These are exactly the same measures that are recommended to reduce psychological stress risks as a way of 'prevention at the source' (Pot et al. 1994; Cox et al. 2000). People do not suffer from severe strain because of problems and disturbances in their work, but because they are not able to solve these (De Sitter et al. 1997). Such problems reveal discrepancies, for example, between quantitative job demands and available time or staff, between qualitative job demands and education or training, between problems and disturbances on the one hand, and support from supervisors and colleagues on the other hand, between complexity of the job and control capacity (De Sitter et al. 1997).

Such reasoning has found a theoretical home in the so-called 'job demand - control model'. This model argues that - to understand performance - a proper work organisation is more important than satisfaction (Karasek/Theorell 1990). 'High demands and high control' provides opportunities for learning, whereas 'high demands and low control' is a stress risk and stress inhibits learning. Design and implementation of active jobs (high demands, control/autonomy and support) is an important sub dimension of workplace innovation. A recent review of 83 studies between 1998 and 2007 shows that there is almost always a positive effect on general psychological well-being where the sample size of the study was sufficient to calculate effect. For effects to job-related well-being (job satisfaction and

*Table 1 Social innovation of work and employment*

<b>Elements</b>	<b>Labour market innovation</b>	<b>Workplace innovation</b>
Needs	Increased labour productivity, development of competences, flexible organisation, innovative capacity.	Ibid
Societal challenges	Global competition, knowledge economy, decreasing/ageing workforce, technology gap.	Ibid
Values	Sustainable, smart and inclusive growth	Competitiveness and performance, development of talents, quality of working life

Process dimensions	New forms of collaboration with social partners, governments and research institutions, and industrial relations on national and sector level.	Participation of stakeholders, trust
Levels of action	European, national, regional and sector.	Public and private organisations, sector, region
Content dimensions	(National/European) Policy measures on labour market, social security, education, flexicurity, systems and infrastructure innovation and innovation programmes (e.g. Social Innovation Europe (SIE) and Flexicurity as active labour market & social protection policy (European Commission); and competencies & training (ESF), promotion of non-technological innovation and workplace innovation (Flagship Initiatives).	Organisational measures on work organisation, labour relations and network relations (e.g. The combination of organisational innovation, ergonomics, development of competences, employment relations within the organisation).

emotional exhaustion) there was consistent evidence in cross-sectional studies, but support rates were lower in longitudinal data (Häusser et al. 2010).

The relationship between work organisation and learning opportunities can be extended further. In much research, control is only measured by job autonomy (freedom of action within a specific job). Job autonomy makes it possible to learn how to do the job better. This could be called 'internal control capacity,' which is related to 'single loop learning': doing things better (Argyris/Schon 1978). Without job autonomy an employee can solve problems only in a standardised manner, without really learning anything new. Another question however is 'are we doing the right things': 'double loop learning'? This requires for the worker control of another kind, which could be called 'external control capacity' (participation in decision making, consultation on the shop floor, co-determination) as is elaborated in 'modern sociotechnology' (De Sitter et al. 1997; Kira/Eijnatten 2008), the 'action regulation theory' (Hacker 2003) and in theories of the 'learning organisation' (Senge 1990), 'high road organisations' (Totterdill et al. 2002 and 2009), 'the flexible firm' (Oeij et al. 2006; Goudswaard et al. 2009) and the 'innovative firm' (Sabel 2006).

The same kind of reasoning concerning autonomy, learning and control holds for ergonomic design of workplaces. This serves not only as the objective of the reduction of physical workload, prevention of musculoskeletal diseases (allowing better postures and movements; reducing lifting) and health improvement (physical exercise), but also that of enhancing productivity (easier and faster handling and processing; better lay-out). In particular if the design and implementation processes are characterized by a participatory approach (Koningsveld et al. 2005; Vink et al. 2006; Koningsveld 2008).

In this sense, workplace innovation is directed at both improved organisational performance and improved QWL. Workplace innovation serves both economic goals, namely performance and productivity (as is the case with non-technological innovation), and social goals (talent development and well-being).

### **3. Different meanings of ‘social’ and disputable contradictions**

Some conceptual confusion is caused by the different meanings of ‘social’. One meaning refers to political objectives such as ‘good for people’, either on individual or on societal level (empowerment, health, well-being), opposed to business innovation or economic innovation. A second meaning refers to intervention domains, complementary to technological innovation, such as institutional arrangements, behaviours, work organisation, HRM and work relations. A third meaning refers to change agents: civil society, social entrepreneurs, employees, opposed to public authorities and management.

So, sometimes innovations are not considered to be social innovations if they are primarily focussed on business targets or if they are initiated by public authorities or management. However, the contradictions concerning agents and objectives are not tenable. When we look at the first EU pilot project social innovation on ‘active and healthy ageing’ it becomes clear immediately that public authorities, technology industry, pharmaceutical industry, commercial and not-for-profit (health)care institutions, patients associations, families and neighbourhoods have to participate and collaborate in finding solutions. Looking at work and employment on societal level, employment policies by the EU, member states and social partners need to become social innovative to achieve inclusive growth. Workplace innovation is needed to achieve smart and sustainable growth through ‘working smarter’ and competence development for ‘sustainable employability’. Of course it is possible to initiate non-technological innovation only for business targets, without any concern for competence development and/or quality of working life. We would not call that workplace innovation or social innovation at work.

### **4. Workplace innovation not yet clearly defined in EU policy**

Within the context of European policy, social innovation is conceived as a broad topic, as it is a means to combat both social and societal challenges such as the financial and economic crisis, unemployment, participation, social cohesion, climate change and innovation, productivity and growth through societal innovation. ‘Social innovation refers to new responses to pressing social demands, by means which affect the process of social interactions. Social innovations are characterised by the production of a social return and the creation of new social relationships or

partnerships which involve the end users and thereby make policies more effective' (European Commission 2010a). A study on social innovation by the Social Innovation eXchange (SIX) and the Young Foundation (Caulier-Grice et al. 2010: 17-18) provides another definition of social innovations as being: '...social both in their ends and in their means. Specifically, we define social innovations as new ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) *and* create new social relationships or collaborations. In other words they are innovations that are both good for society *and* enhance society's capacity to act'. The European Commission has embraced this definition (European Commission 2010a: 2), arguing that just as stimulating innovation, entrepreneurship and the knowledge society was at the core of the Lisbon strategy for growth and jobs, social innovation should now be part of a new strategy to reach sustainable growth in the EU.

Unfortunately workplace innovation programmes have been overlooked in these documents, not taking into account EU's own history. Looking at the European policy on workplace innovation at the end of last century we find the Commission's initiative to prepare a 'Green Paper on Partnership for a new Organisation of Work' (European Commission 1997). This paper was a first attempt to organise the field of work organisation as a separate policy goal. In the framework of that paper, Totterdill, Dhondt and Milsome (2002) investigated 100 cases in six countries and developed the concept of 'the high road of organisational innovation'. This so-called 'high road of organisational innovation' aims at sustainable innovation by employee involvement and a high quality of working life. The alternative for this strategy is characterised in this study as 'mainly oriented at cutting costs'. The authors also list several benefits of the high road, which could be measured: productivity, quality of products, and costs. Less tangible effects were: knowledge, innovation, technological efficacy, and quality of working life (Totterdill et al. 2002).

The relation between work organisation, competence development, QWL and social innovation has recently been mentioned in the draft guidelines for the employment policies (European Commission 2010b) and in the accompanying document for the Flagship Initiative Innovation Union (European Commission 2010c). At the launch event of Social Innovation Europe (SIE), initiated by DG Enterprise and Industry, on 16/17 March 2011 a workshop on Workplace Innovation was organised (Dhondt et al. 2011) as well as at Challenge Social Innovation in Vienna on 19 – 21 September 2011. In other words, it is observed that Europe seems at the brink of uniting the concepts of social innovation and workplace innovation. We give some more examples to support this optimistic view.

In the draft 'Guidelines for the employment policies of the Member States' we find the following text in proposed guideline 7: "Work-life balance policies with the provision of affordable care and innovation in work organisation should be geared to raising employment rates, particularly among youth, older workers and women, in particular to retain highly-skilled women in scientific and technical fields. Member States should also remove barriers to labour market entry for newcomers, support self-employment and job creation in areas including green employment and care and promote social innovation" (European Commission, 2010b: 8). Guideline 8 is mainly on developing a skilled workforce: "Investment in human resource development, up-skilling and participation in lifelong learning schemes should be promoted through joint financial contributions from governments, individuals and employers" (European Commission 2010b: 9).

Unfortunately 'promoting job quality' is only mentioned in the title of this guideline 8. Finally, some additional texts have been proposed by the Employment Committee on the Employment Guidelines, including these citations: "Together with the social partners, adequate attention should also be paid to internal flexicurity at the workplace" and "The quality of jobs and employment conditions should be addressed." (Council of the European Union 2010:12).

In 2007 an ESF-programme (DG EMPL) focused on a more flexible labour market. One of the main areas proposed for investment was the 'design and dissemination of innovative and productive methods of work organisation'. The European Social Fund (ESF) invests in social innovation: more than €2 billion in institutional capacity building; another €2 billion in mutual learning between the Member States "and a further €1 billion is spent on innovative activities related to new forms of work organisation, better use of employees' skills and resources, productivity improvement, new approaches to lifelong learning and new ways of combating unemployment through entrepreneurship. Overall, however, activity levels are sub-critical and most authorities involved in social innovation activities recognise the need for experimentation and 'scaling-up'" (European Commission 2010c: 67).

The European Parliament, in its Resolution of 12 May 2011 on Innovation Union "stresses that social innovation provides an opportunity for citizens, in any role, to enhance their working and life environment and thus could help strengthen the European social model."

Social partners at European level also discussed the issue of workplace innovation. The European Economic and Social Committee stressed in an own opinion initiative that "The idea that quality and social innovations implemented in the workplace have a major impact on business success must be actively promoted" (EESC 2007). In its recent own-initiative opinion "The EESC believes that although the concept of the 'innovative workplace' is not mentioned in the Commission document, it is at the heart of the Europe 2020 strategy, as it is one of the key prerequisites for the success of this strategy, and therefore recommends that the 'innovative workplace' concept should be incorporated into the strategy" and "Workplace innovation is used to try and sustainably improve the productivity of organisations, while improving the quality of working life" (EESC 2011: 1 and 4).

There is also support for workplace innovation in another important and recent international document, 'The OECD innovation strategy', which is the culmination of a three-year, multi-disciplinary and multi-stakeholder effort. The OECD emphasises that 'empowering people to innovate' and 'fostering innovative workplaces' is important for creativity, innovation and productivity. Although these topics are subject of firms' decisions, "governments may be able to shape national institutions to support higher levels of employee learning and training in the workplace" (OECD 2010a: 74-80). The relation between types of work organisation and organisational learning to foster innovative workplaces is further elaborated by the OECD and partners, making use of the data of the European Working Conditions Survey of Eurofound, Dublin (OECD 2010b).

A recent literature study on social innovation even states that a paradigm shift in innovation is becoming manifest: as economic and technological innovation are proving to be insufficient in effectively combating broad societal issues, it is necessary to turn to social innovation, including the renewal of workplaces (Howaldt/Schwarz 2010).

## 5. EU support for workplace innovation needed

In conclusion, one can say that, despite the use of broad concepts of social innovation in many of the EU-policy documents and related studies, it can be discerned that the road is paved for workplace innovation as well.

However, public and private organisations do not easily implement workplace innovation for the following reasons. There is only little research on the claim of a win-win-situation. Quite a number of managers wait for others to find out how it works or prefer short term results instead of long term innovativeness. A lot of managers are not equipped for participatory approaches and/ or are afraid to share power with their employees. Trust is a difficult asset to develop and to maintain. So, if we leave workplace innovation to the initiative of the market, we can only expect workplace innovation in a limited number of organisations with visionary governors and strong works councils. The majority of interventions will be just cost reduction strategies. EU and national campaigns are needed to support workplace innovation, in particular in those countries where there is little experience. The research that is available clearly shows the possibility of convergence of organisational performance and quality of working life which is a prerequisite to achieve the EU2020 objectives of smart, sustainable and inclusive growth.

## References

Argyris, C.; Schön, D. 1978, Organisational learning. Massachusetts: Addison-Wesley

Caulier-Grice, J.; Kahn, L.; Mulgan, G.; Pulford, L.; Vasconcelos, D. 2010, Study on social innovation. Social Innovation Exchange (SIX)/Young Foundation

Cox, T.; Griffiths, A.; Rial-González, E. 2000, Research on work-related stress. Luxemburg: European Agency on Safety and Health at Work

Council of the European Union 2010, Proposal for a Council Decision on guidelines for the employment policies of the Member States. Part II of the Europe 2020 Integrated Guidelines. Opinion of the Employment Committee, Brussels, 21 May 2010, Inter institutional File 2010/0115(NLE)

De Sitter, L.U.; Hertog, J.F.; Dankbaar, B. 1997, "From complex organisations with simple jobs to simple organisations with complex jobs", Human Relations 50 (5, 1997): 497-534

Dhondt, S.; Gramberen, M. Van.; Keuken, F.; Pot, F.; Totterdill, P.; Vaas, F. 2011, Workplace innovation, Social Innovation Europe launch event, Nottingham: UKWON.

Eckelaert, L.; Dhondt, S.; Oeij, P.; Pot, F.; Nicolescu, G.I.; Webster, J. and Elsler, D.forthcoming, Review of workplace innovation and its relation with occupational safety and health, Bilbao: European Agency for Safety and Health at Work

European Commission 1997, Green Paper on Partnership for a new organisation of work, Luxembourg

European Commission 2010a, Social innovation as part of the Europe 2020 strategy, Brussels: Bureau of European Policy Advisers



- European Commission 2010b, Proposal for a Council Decision on guidelines for the employment policies of the Member States. Part II of the Europe 2020 Integrated Guidelines, Brussels: COM92010) 193/3
- European Commission 2010c, Accompanying document to the Europe 2020 Flagship Initiative Innovation Union, Brussels: Commission staff working document, COM(2010)546/ SEC(2010)1161
- European Economic and Social Committee 2007, Promoting sustainable productivity in the European workplace. Brussels (SOC/266)
- European Economic and Social Committee 2011, Innovative workplaces as a source of productivity and quality jobs, Brussels (SC/034)
- Eurofound 2005, *New forms of work organisation. Can Europe realise its potential? Results of a survey of direct participation in Europe*, Dublin: Eurofound
- Goudswaard, A.; Oeij, P.; Brugman, T.; De Jong, T. 2009, Good practice guide to internal flexibility policies in companies, Dublin: European Foundation for the Improvement of living and Working Conditions
- Hacker, W. 2003, "Action regulation theory: a practical tool for the design of modern work", *European Journal of Work and Organisational Psychology* 12 (2, 2003): 105-130
- Häusser, J.A.; Mojzisch, A.; Niesel, M.; Schulz-Hardt, S. 2010, "Ten years on: A review of recent research on the Job Demand-Control (-Support) model and psychological well-being", *Work & Stress* 24 (1, 2010): 1-35
- Howaldt, J.; Schwarz, M. 2010, *Social Innovation: concepts, research fields and international trends*. Dortmund: Sozialforschungsstelle Dortmund, ZWE der TU-Dortmund
- Judge, T.A.; Thoresen, C.J.; Bono, J.E.; Patton, G.K. 2001, "The job satisfaction - job performance relationship: a qualitative and quantitative review", *Psychological Bulletin* 127 (2001): 376-407
- Karasek, R.A.; Theorell, T. 1990, *Healthy work; stress, productivity and the reconstruction of working life*, New York: Basic Books
- Kira M.; Eijnatten M., van. 2008, "Socially sustainable work organizations: a chaordic systems approach", *Systems Research and Behavioral Sciences* 25 (2008):743-756
- Koningsveld, E.A.P.; Dul, J.; Rhijn, J.W.van.; Vink, P. 2005, "Enhancing the impact of ergonomic interventions", *Ergonomics* 48 (5, 2005): 559-580
- Koningsveld E.A.P. 2005, "Participation for understanding: an interactive method", *Journal of Safety Research* 36 (2005): 231-236
- Koningsveld, E.A.P. 2008, "Factors of competitive advances through ergonomics interventions", in Sznclwar L.I.; Mascia, F.L.; Montedo, U.B. eds. *Human Factors in Organisational Design and Management*, Santa Monica Ca.: IEA Press: 265-270
- OECD 2010a, *The OECD innovation strategy: getting a head start on tomorrow*, Paris: OECD Publishing, [www.oecd.org/innovation/strategy](http://www.oecd.org/innovation/strategy)
- OECD 2010b, *Innovative workplaces. Making better use of skills within organisations*, Paris: OECD Publishing, <http://dx.doi.org/9789264095687-en>
- Oeij, P.; Dhondt, S.; Wiezer, N. 2006, "Conditions for low stress-risk jobs: Europe's case" *European Journal of Social Quality* 6 (2, 2006): 81-108
- Oeij, P.; Dhondt, S.; Korver, T. forthcoming, "Social innovation, workplace innovation and social quality", *International Journal of Social Quality* 1 (2, Winter 2011), in press

- Pot, F.D.; Peeters, M.; Vaas, F.; Dhondt, S. 1994, "Assessment of stress risks and learning opportunities in the work organization", *European Work and Organisational Psychologist* 4 (1,1994): 21-37
- Pot, F.D.; & Koningsveld, E.A.P. 2009, "Quality of working life and organizational performance – two sides of the same coin?" *Scandinavian Journal of Work, Environment and Health* 35 (6, 2009): 421-428
- Pot, F.D. 2011, "Workplace innovation for better jobs and performance". *International Journal of Productivity and Performance Management* 64 (4, 2011): 404-415
- Pot, F. et al. (forthcoming) "Workplace innovation in the Netherlands", in Houtman, I. ed. *Quality of Working Life in the Netherlands 2*, Hoofddorp: TNO
- Ramstad, E. 2009, "Promoting performance and the quality of working life simultaneously", *Internal Journal of Productivity and Performance Management* 58 (5, 2009): 423-436
- Sabel, C.F. 2006, "A real-time revolution in routines", in Heckscher, C.; Adler, P. eds. *The firm as a collaborative community*, Oxford University Press:106-156
- Senge, P. 1990, *The fifth discipline*, Doubleday: New York
- Taris, T.W.; Schreurs, P.J.G.; Eikmans, K.J.L.; Riet, Pim van. 2008, "Werkkenmerken, welzijn en organisatieprestatie: een toets van de happy-productive worker hypothese op organisatieniveau. (Work characteristics, well-being and organisational performance: a test of the happy-productive worker hypothesis on organisation level)", *Gedrag & Organisatie* 21 (1, 2008): 3-18
- Totterdill, P.; Dhondt, S.;Milsome, S. 2002, *Partners at work? A report to Europe's policymakers and social partners*, Nottingham: The Work Institute
- Totterdill, P.; Exton, O.; Exton, R.; Sherrin, J. 2009, *Workplace innovation policies in European countries*, Nottingham: UKWON
- Totterdill, P. 2010, *Workplace innovation. Europe 2020's missing dimension*, Report of a workshop hosted by DG Employment, Social Affairs and Equal Opportunities, 23rd June 2010, Nottingham: UKWON
- Vink, P.; Koningsveld, E.A.P.; Molenbroek, J.F. 2006, "Positive outcomes of participatory ergonomics in terms of greater comfort and higher productivity" *Applied Ergonomics* 37 (2006): 537-546
- Volberda, H.W.; Bosch, F.A.J. van den; Jansen, J.J.P. 2006, *Slim managen & innovatief organiseren (managing smartly and organising innovatively)*, Eiffel
- Westgaard, R.H.; Winkel, J. 2011, "Occupational musculoskeletal and mental health: Significance of rationalization and opportunities to create sustainable production systems – A systematic review", *Applied Ergonomics* 42 (2, 2011): 261-296