

# Ethnonursing and the ethnographic approach in nursing

**Cite this article as:** Molloy L, Walker K, Lakeman R, Skinner I (2015) Ethnonursing and the ethnographic approach in nursing. *Nurse Researcher*. 23, 2, 17-21.

Date of submission: July 7 2014. Date of acceptance: January 7 2015.

**Correspondence**  
luke.molloy@utas.edu.au

Luke Molloy RPN, MN lead, MN (Hons), is programme co-ordinator at the School of Health Sciences, University of Tasmania, NSW, Australia

Kim Walker RN, PhD, is professor of healthcare improvement at the University of Tasmania, NSW, Australia

Richard Lakeman RN, DNursingSc, is clinical nurse consultant at Queensland Health QLD, Australia

Isabelle Skinner RN, PhD, is professor of nursing at the University of Tasmania, NSW, Australia

**Peer review**  
This article has been subject to double-blind review and has been checked using antiplagiarism software

**Author guidelines**  
journals.rcni.com/r/  
nr-author-guidelines

## Abstract

**Aim** To present a critical methodological review of the ethnonursing research method.

**Background** Ethnonursing was developed to underpin the study and practice of transcultural nursing and to promote 'culturally congruent' care. Ethnonursing claims to produce accurate knowledge about cultural groups to guide nursing care. The idea that the nurse researcher can objectively and transparently represent culture still permeates the ethnonursing method and shapes attempts to advance nursing knowledge and improve patient care through transcultural nursing.

**Data sources** Relevant literature published between the 19th and 21st centuries.

**Review methods** Literature review.

**Discussion** Ethnography saw a 'golden age' in the first half of the 20th century, but the foundations

of traditional ethnographic knowledge are being increasingly questioned today.

**Conclusion** The authors argue that ethnonursing has failed to respond to contemporary issues relevant to ethnographic knowledge and that there is a need to refresh the method. This will allow nurse researchers to move beyond hitherto unproblematic notions of objectivity to recognise the intrinsic relationship between the nurse researcher and the researched.

**Implications for research/practice** A revised ethnonursing research method would enable nurse researchers to create reflexive interpretations of culture that identify and embody their cultural assumptions and prejudices.

**Keywords** ethnography, ethnonursing, transcultural nursing, culture, nursing research, anthropology, Leininger

## Introduction

Ethnonursing is a research method developed by Madeleine Leininger that attempts to combine concepts from ethnography and nursing. Leininger's anthropological experience with ethnography in the 1960s was a core feature of ethnonursing's development (Leininger 2001). As the bedrock of the discipline of anthropology, ethnography has been adopted by many disciplines in their attempts to understand cultural phenomena.

There is no standardised interpretation of (Pellatt 2003). In its classic form, ethnography involves the researcher participating in people's lives for an extended period of time, observing what happens, listening to what is being said and asking questions (Crowley-Henry 2009). Stereotypically, this involves an exotic people, the 'subaltern', those who are

disadvantaged in a society or anyone who stands as some sort of 'other' to the well-educated and well-resourced Westerner (Madden 2010).

The history of ethnography's development is complex. By the 19th century, the term 'ethnography' had come to refer to an integration of first-hand investigation and the theoretical interpretation of a culture (Hammersley and Atkinson 2007). It had emerged from an anthropological tradition that had its focus on 'native culture', at a time of European imperialism and a dominance of ideas about the superiority of certain groups of people over others. Many of the studies of this early period were shaped by this ideology and the prevailing power structures that were informed by it (Murchison 2010). They are the foundations on which ethnography in the modern age was built.

Lewis Henry Morgan was one of the founders of American anthropology. Morgan's use of ethnography provided the foundations for the anthropological field of 'kinship studies'. In his work, Morgan fused racism with the ideas of evolution, concluding that at 'the Middle Period of barbarism... the Aryan and Semitic families seem fairly to represent the central threads of... progress, which in the period of civilisation has been gradually assumed by the Aryan family alone' (Morgan 1877).

Similarly, Edward Tylor, the first professor of anthropology at Oxford University and a founder of the discipline of cultural anthropology, noted: 'On the definite basis of compared facts, ethnographers are able to set up at least a rough scale of civilisation. Few would dispute that the following races are arranged rightly in order of culture: Australian, Tahitian, Aztec, Chinese, Italian' (Tylor 1871).

The work of these major figures shows that by the latter half of the 19th century, ethnography was providing a scientific facade to work that manufactured cultural explanations to support imperialism and colonial expansion. Captured in the categorisation of culture, Tylor, Morgan and many others were providing the basis of an ideology that legitimised their nations' sense of superiority (Lewis 1973). This search for difference justified an imagined hierarchy of peoples and produced 'scientific' work that sustained this hegemony.

### Golden age of ethnography

At the start of the 20th century, ethnography underwent a period of transition, in tandem with a metamorphosis of anthropology into a legitimate social science. The golden age of anthropology was beginning. Ethnography was embedded in the colonial system (Asad 1973), as endeavours attempted 'to bring light and civilisation in the dark places of the world, and to touch the minds of Asia and Africa with the ethical ideas of Europe' (Hyatt 1897).

Ethnography had become central to anthropology's effort to establish a renewed discipline. In merging theory with fieldwork methods, a key figure was Bronislaw Malinowski, a founder of social anthropology. He believed the researcher could produce objective, scientific descriptions that represented 'the native's point of view, their relation to life and to realise their vision of the world' (Malinowski 1922). We see clear remnants of the imperialist perspective in this view of ethnography, 'with the omnipotent Western visionary attempting to make sense of the unknown, dark hidden culture of the native'" (Goodley *et al* 2004).

Malinowski's significance stems from his research methods and the impact these continue

to have on modern ethnographic practice. Participant observation became the key approach to Malinowski's fieldwork. This involved research over many months, living with the group of people on whom the research was focused and maintaining detailed field notes for analysis. For Malinowski, direct observation offered the 'outsider' a way of interpreting the significance of the group's social practices. The idea was that this enabled the researcher to view the world in the way the group members viewed it.

Rosaldo (1993) argued that this model foregrounds 'the lone ethnographer' who describes the peoples he or she encounters as harmonious, internally homogenous and inhabiting a static culture, the supposed unchanging nature of which serves as a 'self-congratulatory reference point' against which the West can imagine its more culturally evolved 'superiority'. The supposedly objective ethnographer translates 'the utterances of the native informant' into a coherent form (Cotera 2008), the results projecting universal essentialisation of 'us' and 'them' on the groups (Pels and Salemink 1994). This helped to perpetuate power imbalances by imagining and representing the indigenous populations as an inferior 'other' (Asad 1973).

In this imagined otherness, the ethnographer was 'unable to envisage and argue for a radically different political future for the subordinate people he studie[d]' and acted as the subtle agent of colonial supremacy: 'Anthropology does not merely apprehend the world in which it is located, but... the world also determines how anthropology will apprehend it' (Asad 1973). The generation of ethnographers produced in this intellectual environment, however, would generally ignore the way their Western preconceptions influenced their observations (Shadd 2006).

### Rendered reality critiqued

Tedlock (1991) noted that in the 1970s, there was yet another shift in ethnography, which saw a movement from participant observation toward 'the observation of participation'. This was characterised by critical reflection on the production of ethnographic knowledge. This period of transition was marked by a 'loss of innocence' (Elie 2006); the ethnographic ideal of the neutral, objective observer producing data that reflected the other's perspective was challenged. The idea that these data were a rendered reality, exact and unfiltered by the researcher's values or interpretive schema, was questioned (Pratt 1986). For many, it could no longer be presumed that the researcher was delivering an objective, uncontested account of the other's experience (Clifford 1986).

This represented a significant change from the ideals of empiricism that had previously driven ethnography's development. It also raised the question of whether ethnography could be viewed as scientific at all (Atkinson and Hammersley 1998). Elie (2006) sardonically identified the forces that destabilised the ideals as 'the postcolonial insurgency, the feminist revolt, and the poststructuralist destabilisation'. That the forces driving these developments can be easily isolated to particular intellectual movements is an over-simplification, but what is undeniable is that ethnography has recently undergone a period of radical critique.

Denzin and Lincoln (2005) identified a 'profound rupture' occurring in the 1980s, with works such as Marcus and Fischer (1986) and Clifford and Marcus (1986) calling into question issues of gender, class and ethnicity in ethnography and arguing for research and writing to be more reflexive during their production. These works echoed a 'crisis of representation' that raised questions about how the 'totalising frameworks' and 'encompassing paradigms' of the social science could represent social reality unproblematically (Marcus and Fischer 1986).

Postmodernism, in its more extreme versions, brought a growing emphasis on indeterminacy in the analysis of culture. Flaherty *et al* (2002) noted that the postmodern perspective highlighted that it could no longer be assumed that there was a single 'correct' interpretation of reality because one's interpretation of facts - including the 'facts' themselves - were products of one's interpretive stance. Therefore, it is impossible to establish any form of unchallenged authority or truth (Lyotard 1984).

From the postmodern perspective, authorship becomes problematic in ethnography (Fontana 1994). Authors can no longer assume an invisibility, as their work attests to the limits of their cultures and their cultures' interpretative powers (Crapanzano 1986). Clifford (1986) described a postmodern construct of ethnography as a process that produces a fiction, as it is 'something made or fashioned' by the writer - anathema to any researcher who subscribes to the positivist scientific perspective.

The 'crisis of representation' challenged the intellectual authority of the ethnographer and the moral authority of the approach. Validity, reliability and objectivity had become problematic for ethnographers again (Denzin and Lincoln 2005). Culture was now viewed as contested, temporal and emergent, and representation and explanation were implicated in this emergence (Clifford 1986). The person undertaking an ethnographic study can now no longer presume to be able to present an uncontested, objective account of another

person's experiences (Denzin 1997). Any claims to authority can be judged false.

### Ethnography and nursing

There were a number of nurses who had received doctoral preparation in anthropology in 1960s and who attempted to establish the use of ethnographic methods in nursing. An important figure was Madeleine Leininger, who had undertaken an ethnographic study of the Gadsup people in New Guinea. From this experience, Leininger determined that care and beliefs about health were embedded in people's 'values, worldviews and life patterns' (Cohen 1991).

Leininger envisioned the need for scientific and humanistic transcultural knowledge (Leininger 1997), and blended ideas from anthropology and nursing to develop the concept of 'transcultural nursing' (Leininger 1970). She viewed nursing and anthropology as 'unified in a single specific and unitary whole' (Leininger 1970). Underpinning this approach to nursing is the 'culture care theory', which asserts that nurses can only provide 'culturally congruent' care to patients when they know the expressions, patterns and practices of their patients' culture (Leininger 2001).

The research method Leininger developed to underpin practice is 'ethnonursing' (Leininger 2001). This attempts to combine concepts from ethnography and nursing, and 'focuses mainly on observing and documenting interactions with people of how these daily conditions, and patterns are influencing human care, health, and nursing care practices' (Leininger 1985). Research using this method has focused on groups including Syrian-American Muslims (Wehbe-Alamah 2011), German-American Lutherans (McFarland and Zehnder, 2006) and substance-dependent African-American women (Ehrmin 2005).

The ethnonursing researcher does not focus on whole populations, instead focusing on 'key' and 'general' informants (Leininger 2001). These are the people judged to be the most knowledgeable about the culture of interest. Key informants purportedly have a compelling understanding of the norms, beliefs, values and general way of life of the culture. In contrast, general informants usually have general ideas about the domain and can help verify information given by the key informants (Leininger 2001). It is the researcher who defines these two levels of informants, this decision seemingly supported only by their own authority. For example, McFarland (1997) studied Anglo-American and African-American elders in a long-term care setting. She selected 14 Anglo-American (five key and

**Box 1 Four phases of ethn nursing**

- Collecting, describing and recording data.
- Identifying and categorising descriptors.
- Data analysis to uncover repetitive patterns in the context.
- Identifying major themes and reporting the findings.

(Leininger and McFarland 2006)

nine general informants) and 12 African-American (four key and eight general informants) residents 'carefully and purposefully' on the basis of who 'might be most knowledgeable'.

Ethn nursing involves four phases (Box 1). In keeping with its anthropological roots, the researcher undertakes observation, interviews and reflection to generate knowledge. For example, Wolf *et al* (2014) participated in Somali community activities, shopped at Somali shops and visited Somali community centres for a year before conducting interviews.

Leininger (2001) developed several conceptual frameworks from the 1960s onwards, including the 'stranger-friend model' for gaining the acceptance of informants and the 'observation-participation-reflection model' for observing participants. These frameworks purported to enable portrayals of indigenous people's views with a high degree of accuracy, reliability and validity (Leininger 1978). Leininger (1978) asserted that nurses can use the information they have gathered through this process to make predictions about a particular group's attitudes and beliefs towards health. Leininger (2002) stated that ethn nursing has led to a body of knowledge about culture and care that can 'assure culturally competent, safe, and congruent

transcultural nursing care'. This knowledge, it is claimed, enables nurses to understand 'vague, largely complex, covert, and unknown' cultural phenomena, and provides a basis for 'culturally congruent' nursing practice (McFarland and Wehbe-Alamah 2014).

**New approach to ethn nursing**

Ethn nursing tries to establish truths regarding culture, the outcome being a credible, unbiased study producing substantive evidence. It has failed to respond to contemporary issues relevant to ethnographic knowledge: despite claims of an interconnection with anthropology, the method is nostalgic for another age and is not in keeping with the critiques and discourse of the modern discipline of anthropology. It is unsuited to our postcolonial, multicultural world and the nursing care we provide. Transcultural nurses using the ethn nursing method now find themselves 'unified' with structures and processes that have created oppressive assumptions about people and been linked to processes of genocide in the colonial era (Bourgeois 2002).

The reconfiguration of social thought that occurred in the later part of the 20th century must make us question the claims of our methodologies (Geertz 1983). Ethn nursing needs to move beyond the pursuit of generalisations and the presentation of groups of people as internally homogenous with clearly defined borders with other groups.

The idea that culture has a pattern and presents a coherent and discoverable whole that a researcher can reflect with detached impartiality 'as it really is' is a nice idea, but a fanciful one (Moore 1986). For example, Wehbe-Alamah (2011) claimed to have discovered 'universal themes' and 'universal patterns'

**References**

- Asad T (1973) Two European images of non-European rule. In Asad T (Ed) *Anthropology and the Colonial Encounter*. Ithaca Press, Atlantic Heights NJ.
- Atkinson P, Hammersley M (1998) Ethnography and participant observation. In Denzin NK, Lincoln YS (Eds) *Strategies of Qualitative Inquiry*. Second edition. Sage Publications, Thousand Oaks CA.
- Bourgeois P (2002) Ethnography's troubles and the reproduction of academic habitus. *Qualitative Studies in Education*. 15, 4, 417-420.
- Clifford J (1986) Introduction: partial truths. In Clifford J, Marcus GE (Eds) *Writing Culture: The Poetics and Politics of Ethnography*. University of California Press, Berkeley CA.
- Clifford J, Marcus GE (Eds) (1986) *Writing Culture: The Poetics and Politics of Ethnography*. University of California Press, Berkeley CA.
- Goodley D, Lawthom R, Clough P *et al* (2004) *Researching Life Stories: Method, Theory and Analyses in a Biographical Age*. Routledge Falmer, London.
- Cohen JA (1991) Two portraits of caring: a comparison of the artists, Leininger and Watson. *Journal of Advanced Nursing*. 16, 8, 899-909.
- Comaroff J, Comaroff J (2003) Ethnography on an awkward scale: postcolonial anthropology and the violence of abstraction. *Ethnography*. 4, 2, 147-179.
- Cotera M (2008) *Native Speakers: Ella Deloria, Zora Neale Hurston, Jovita Gonzalez, and the Poetics of Culture*. First edition. University of Texas Press, Austin TX.
- Crapanzano V (1986) Hermes' dilemma: the masking of subversion in ethnographic description. In Clifford J, Marcus GE (Eds) *Writing Culture: The Poetics and Politics of Ethnography*. University of California Press, Berkeley CA.
- Crowley-Henry M (2009) Ethnography: visions & versions. In Hogan J, Dolan P, Donnelly P (Eds) *Approaches to Qualitative Research: Theory & Its Practical Application. A Guide for Dissertation Students*. Oak Tree Press, Cork, Ireland.
- Denzin NK (1997) *Interpretive Ethnography: Ethnographic Practices for the 21st Century*. Sage Publications, Thousand Oaks CA.
- Denzin NK, Lincoln YS (Eds) (2005) *The Sage Handbook of Qualitative Research*. Third edition. Sage Publications, Thousand Oaks CA.
- Ehrmin JT (2005) Dimensions of culture care for substance-dependent African American women. *Journal of Transcultural Nursing*. 16, 2, 117-25.
- Elie S (2006) Anthropology and post-colonial thought: the paradoxical quest for positionality. *Studies in Social and Political Thought*. 12, 53-72.
- Flaherty MG, Denzin NK, Manning PK *et al* (2002) Review symposium: crisis in representation. *Journal of Contemporary Ethnography*. 31, 4, 478-516.
- Fontana A (1994) Ethnographic trends in the postmodern era. In Dickens DR, Fontana A (Eds) *Postmodernism and Social Inquiry*. UCL Press, London.
- Geertz C (1983) *Local Knowledge: Further Essays in Interpretive Anthropology*. Basic Books, New York NY.
- Gupta A, Ferguson J (1997) Discipline and practice: 'the field' as site, method, and location in anthropology. In Gupta A, Ferguson J (Eds) *Anthropological Locations: Boundaries and Grounds of a Field Science*. University of California Press, Berkeley CA.
- Hammersley M, Atkinson P (2007) *Ethnography: Principles in Practice*. Taylor & Francis, London.
- Hyatt HF (1897) The ethics of empire. *The Nineteenth Century*. XLI, April, 529.
- Leininger M (1970) *Nursing and Anthropology*. John Wiley & Sons, New York NY.
- Leininger M (1978) *Transcultural Nursing: Concepts, Theories, Research & Practice*. First edition. McGraw-Hill, Columbus OH.
- Leininger MM (1985) Ethnography and ethn nursing: models and modes of qualitative data analysis. In Leininger MM (Ed) *Qualitative Research Methods in Nursing*. Grune & Stratton, Orlando FL.
- Leininger M (1997) Transcultural nursing research to transform nursing education and practice: 40 Years. *Image*. 29, 4, 341-347.

related to Syrian-American Muslims from a study of 30 people. In light of the anthropological critique of ethnographic knowledge, we believe that a study of such a group of people could provide the basis for a cultural analysis of social phenomena and their implications for healthcare, but such a study must move beyond essentialism and the idea that it can create a supposedly holistic description (Gupta and Ferguson 1997).

In a world where it is impossible to capture in any one place the complete workings of 'a culture', we must ask ourselves what kinds of methods are appropriate (Comaroff and Comaroff 2003). A refreshed ethnoscience could involve multiple methods that involve direct social contact with people and 'of richly writing up the encounter, respecting, recording, representing at least partly in its own terms the irreducibility of human experience' (Willis and Trondman 2002).

Our social analysis will move beyond the purported, yet ultimately false ideal of the detached observer using 'neutral language' to explain 'raw data' (Rosaldo 1993) to creating reflexive interpretations that identify the researchers' cultural assumptions and prejudices and recognise the relationship between them and the people with whom they have contact. The methodology will further expose how politics, gender, class, ideology and ethnicity shape the lives of the people with whom we interact. It will view people's worlds as being constructed through and reflections of historical and political processes, for which it is impossible to create definitive interpretations (Denzin 1997).

The implication of a revised approach to ethnoscience is that nurses will move away from

basing their practice on knowledge that views individuals and communities as being: bounded by certain cultural rules, rights and ways of being; homogenous; and unchanging over time, place and cultural space (Salazar 2013).

## Conclusion

The critique of anthropology's involvement in colonialism and the emergence of new ethnographic concepts have brought into the question traditional forms of ethnography. In the context of ethnoscience, this has brought up challenges to its core principles.

Ethnoscience continues to espouse the methodological virtues of an ethnographic view that is a relic of 19th and 20th century imperialism. It has failed to adequately evolve in response to contemporary conceptualisations of culture and methods for ethnographic enquiry. Nurse researchers using the approach can no longer assume that their research is delivering an objective account of the other's experience.

For a discipline that identifies scholarship, including rigorous enquiry, as being one of its values and that has a goal to advance scholarship (Transcultural Nursing Society 2014), the challenges posed to the 'marquee methodology' of transcultural nursing should no longer be ignored. Nurse researchers interested in ethnoscience need to find new ways of practising and producing ethnographic knowledge. Revising ethnoscience will reinvigorate it, moving it beyond positivist posturing to create reflexive interpretations based on interpersonal contact that recognise the limits of the concept of culture.

## Online archive

For related information, visit our online archive and search using the keywords

## Conflict of interest

None to declare

**Leininger MM** (Ed) (2001) *Cultural Care Diversity & Universality: A Theory Of Nursing*. Jones & Bartlett Learning, Burlington MA.

**Leininger M** (2002) Culture care theory: a major contribution to advance transcultural nursing knowledge and practices. *Journal of Transcultural Nursing*. 13, 3, 189-192.

**Leininger MM, McFarland MR** (2006) *Culture Care Diversity and Universality: A Worldwide Nursing Theory*. Second edition. Jones and Bartlett Publishers, Sudbury MA.

**Lewis D** (1973) Anthropology and colonialism. *Current Anthropology*. 14, 5, 581-602.

**Lyotard J-F** (1984) *The Postmodern Condition: A Report on Knowledge*. University of Minnesota Press, Minneapolis MN.

**Madden R** (2010) *Being Ethnographic: A Guide to the Theory and Practice of Ethnography*. Sage Publications, Thousand Oaks CA.

**Malinowski B** (1922) *Argonauts of the Western Pacific*. EP Dutton & Co, New York NY.

**Marcus GE, Fischer MMJ** (1986) *Anthropology as Cultural Critique: An Experimental Moment in the Human Sciences*. First edition. University of Chicago Press, Chicago IL.

**McFarland MR** (1997) Use of culture care theory with Anglo- and African American elders in a long-term care setting. *Nursing Science Quarterly*. 10, 4, 186-192.

**McFarland MR, Zehnder N** (2006) Culture care of German American elders in a nursing home context. In Leininger MM, McFarland MR (Eds) *Culture Care Diversity and Universality: A Worldwide Nursing Theory*. Second edition. Jones and Bartlett Publishers, Sudbury MA.

**McFarland MR, Wehbe-Alamah HB** (2014) *Leininger's Culture Care Diversity and Universality: A Worldwide Nursing Theory*. Jones & Bartlett Learning, Burlington MA.

**Moore SF** (1986) *Social Facts and Fabrications*. Cambridge University Press, Cambridge.

**Morgan LH** (1877) *Ancient Society: Or, Researches in the Lines of Human Progress from Savagery, through Barbarism to Civilization*. Henry Holt and Company, New York NY.

**Murchison JM** (2010) *Ethnography Essentials: Designing, Conducting, and Presenting Your Research*. John Wiley & Sons, San Francisco CA.

**Pels P, Salemink O** (1994) Colonial ethnographies: introduction. *History and Anthropology*. tinyurl.com/gxb2cac (Last accessed: September 10 2015.)

**Pellatt G** (2003) Ethnography and reflexivity: emotions and feelings in fieldwork. *Nurse Researcher*. 10, 3, 28-37.

**Pratt ML** (1986) Fieldwork in common places. In Clifford J, Marcus GE (Eds) (1986) *Writing Culture: The Poetics and Politics of Ethnography*. University of California Press, Berkeley CA.

**Rosaldo R** (1993) *Culture & Truth: The Remaking of Social Analysis*. Second edition. Beacon Press, Boston MA.

**Salazar NB** (2013) Imagineering otherness: anthropological legacies in contemporary tourism. *Anthropological Quarterly*. 86, 3, 669-696.

**Shadd P** (2006) Putting power in order. *Totem*. 14, 1, article 8.

**Tedlock B** (1991) From participant observation to the observation of participation: the emergence of narrative ethnography. *Journal of Anthropological Research*. 47, 1, 69-94.

**Transcultural Nursing Society** (2014) *Transcultural Nursing Society*. www.tncns.org (Last accessed: September 10 2015.)

**Tylor EB** (1871) *Primitive Culture: Researches into the Development of Mythology, Philosophy, Religion, Art, and Custom*. John Murray, London.

**Wehbe-Alamah H** (2011) The use of culture care theory with Syrian Muslims in the mid-western United States. *Online Journal of Cultural Competence in Nursing and Healthcare*. 1, 3, 1-12.

**Willis P, Trondman M** (2002) Manifesto for ethnography. *Cultural Studies ↔ Critical Methodologies*. 2, 3, 394-402.

**Wolf KM, Zoucha R, McFarland M et al** (2014) *Somali Immigrant Perceptions Of Mental Health And Illness: An Ethnoscience Study*. tinyurl.com/nokgvtq (Last accessed: September 10 2015.)