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Does the country of origin matter in healthcare innovation diffusion?

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VIEWPOINT

There is no shortage of US healthcare research centers advocating the adoption of innovations from other countries. The Institute for Healthcare Improvement (Boston, MA), The Commonwealth Fund (New York, NY), Innovations in Health at Duke University (Durham, NC), and the Network for Excellence in Healthcare Innovation (Cambridge, MA) are all promoting innovations from low-, middle- and high-income countries for potential adoption into the US. However does it matter to their audience if a proposed innovation is from India, rather than from, say, Sweden; or from Rwanda, rather than from say, the United Kingdom? Very little is known about whether, and how, the country of origin of a proposed innovation matters in its diffusion.

The question of country of origin matters considerably to those in the marketing industry. Research spanning several decades has shown that up to 30% of a consumer's attitude to a product can be influenced by the country of origin of that product [1]. There is a complex interaction between the product type, where it is from, where the consumer is from, the demographic characteristics of the consumer and the geo-political characteristics of the two countries. For example, products from England tend to be rated higher by Indian students than by Taiwanese students, because of the colonial ties between India and England. Caucasian consumers tend to rate products from North America more highly than non-Caucasian consumers, who instead rated products from Nigeria, Latin America and

India more highly. Complex as this interaction is, it is also likely to change over time as preferences, political ties, and cultures constantly shift and change as well.

The diffusion of innovation literature in healthcare is silent on the issue. Rogers limits his diffusion of innovation theory only to the characteristics of the adopter [2]. Greenhalgh et al [3] incorporate characteristics of the adopting organization, of the innovation and of the change process but not of the source. Damschroder et al adds to Greenhalgh's model and refers to the source of the innovation needing to be 'legitimate' but sheds little light on what constitutes legitimate, for whom and under what circumstances [4]. In their international study of the cultural dynamics to support innovation diffusion, Keown et al (2014) note the importance of empowering patients, engaging health professionals, promoting learning, refining the innovation and eliminating legacy practices, but again little on the effect of the source of an innovation [5].

None of these models or theories refers to the role of the adopters'-perception-of-the-innovator-source as a mediating factor in the spread of an innovation. This is perhaps because it does not fit neatly into current conceptualizations of mediating factors in innovation diffusion i.e. is it a feature of the innovation, or of the adopter, or of both?

The paucity of research in this area could lead to the assumption that even though country of origin matters when choosing to purchase products such as a car or some

foods, it does not apparently matter when choosing whether to pilot a healthcare innovation so long as the innovation has been approved by the adopting country's regulatory body. The reality is that the effect that source may have on our perception of an innovation is simply a neglected and yet potentially considerably significant issue for both providers and recipients of healthcare. Some evidence suggests that the country of origin matters in research evaluation and publication. A recent randomized, controlled trial showed that a source from a low-income country negatively influenced US public health professors' opinion of research abstracts in some instances [6]. Participants were more likely to refer one abstract, of the four abstracts that were included in the trial, to a peer if the source was from a high-income country compared to a low-income country (OR 1.28; 95%CI 1.02-1.62). Although the effect of size was small under experimental conditions, it may be 'clinically' significant considering how much research is published and consumed on a daily basis. This study established a benchmark with respect to the measurable effect of source on research interpretation and evaluation but needs to be repeated using different types of healthcare professionals and different types of research abstracts as well as the relationship between perception of research and of innovation.

The so-called Reverse Innovation process – the adoption of low-income country innovations into high-income country contexts – is thwarted in part by perceptions that low-income countries are unlikely to offer innovations of value and that these contexts are 'too different' from their own for the innovation to 'fit' [7]. This will

lead to missed opportunities to learn from many exciting innovations arising from these contexts, in areas as diverse as cardiac surgery, ophthalmic surgery, community health workers, mobile phone screening apps, diagnostic support tools, and ambulatory services. For example, Narayana and Aravind are widely acclaimed Indian healthcare models in cardiac and ophthalmic surgery, respectively, yet they have not successfully diffused into more developed markets. The Brazilian Family Health Strategy systematically deploys over 250,000 Community Health Workers to provide cradle-to-grave health advice, universally, through home visits. Peek Vision is a mobile phone based tool for retinography imaging used in Kenya. Ziqitza uses novel cost-sharing finance model to provide ambulance services to poor communities in India.

Understandably most innovations must be incorporated into delivery systems, and how healthcare is financed, organized, and delivered varies from country to country. Adoption processes are likely to be different for services and products. However, given that no two, even neighboring, contexts are the same, differential preference for innovations from one country as opposed to another speaks to biases rather than objective assessments of the reality. To this extent, methodologies from the cognitive psychology literature can be used to examine further assumptions, biases and prejudices [8] concerning how we determine what is and what is not generalizable from one context to another.

More research is needed to better understand the effect of source in interpretation of healthcare research and in the appetite to learn from other countries. It is time to establish a comprehensive research agenda that applies the knowledge and methods from the marketing and consumer affairs literatures to the assessment of healthcare research and innovation. Just as the marketing literature examines the effect of the phrase 'Made in [country]', research into the effect of the phrase 'Authors' affiliation' in biomedical research is needed. It is important to know, using adequately powered, controlled studies, whether research from certain institutions has been given less attention and credibility than from others, all other things being equal. It must be clear if the powerful brand associated with high-impact journals influences readers' perceptions of the research, all things being equal. The relative importance of where the research was conducted compared to who conducted it and where it was published needs to be clarified. For example, what is the relative importance of bibliometric or scientometric markers of legitimacy, such as citation indices, to organizational markers of legitimacy such as university rankings, to socio-economic measures of legitimacy, such as GDP/capita, Human Development Index, infant mortality rates, and Gini Index.

In addition, the interactions between these characteristics and those of the 'Consumer' (the Healthcare professional or equivalent) and the 'Product' (the research article or the innovation) need to be assessed. Using adequately powered, controlled studies, how is the source of a research article or innovation affected by the age, sex, race, academic, clinical or managerial experience of the person

reviewing it, and how this changes by the type of innovation - technological innovations, service delivery innovations or pharmaceutical intervention. For example, are US healthcare managers more amenable to adopting technological innovations from the United Kingdom than US clinicians? Is this the case if the innovation is from Sweden, or Rwanda? Or if it is a service delivery innovation? Does it matter if it is published in a high impact, widely disseminated, general medical journal (such as JAMA or the New England Journal of Medicine) or a more focused journal (such as the Scandinavian Journal of Public Health)?

Significant resources are allocated to better understand the influence of country of origin for *consumers*. Advertising agencies go to great lengths to develop counter-stereotyping and stereotyping campaigns and to create effective brands that build on (or indeed minimize) the image of the source country. It is why it is acceptable to perceive that cars from Japan are efficient, chocolate from Switzerland is delicious and that perfume from France is of high quality. To dissipate any risk to its brand, perhaps this is why Apple writes on all phones “Designed in California, Manufactured in China”. A consumer might have considerably different perceptions of cars, chocolate and perfume if those products were from Ethiopia, Botswana and India respectively. These stereotypes are enduring and well managed through the long-standing efforts of manufacturers and advertisers.

It is time to examine much more closely how these preferences affect the evaluation of research, and influence the diffusion of healthcare innovations.

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