The dominance of western culture in Human-Computer Interaction and methods to elevate non-western ideologies

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Abstract

In this paper, I create a basis for how colonialism has negatively impacted research in Human-Computer Interaction (HCI) by limiting its worldview to that of The West - the nations, states, people, and cultures that make up North America, Europe, and Oceana, especially those that have a long-standing history of colonizing the non-western world. I then review three different research methods currently used within the field for cross-cultural studies and engagement, establishing their goals, strategies, benefits, and shortcomings to determine which best mitigates this problem. Discussed in the order of Hofstede's theory of Cultural Dimensions, postcolonial computing, and decolonial computing, each method seems to fill in a gap that the previous left unaddressed. As such, this paper is a narrative on how Hofstede's theory of cultural dimensions – a long-accepted taxonomic method for cross-cultural studies – has failed HCI in this regard, postcolonial computing – a method that acknowledges the effects of colonialism and described more as a tactic on how to interact with non-western and especially developing cultures – is insufficient, and decolonial computing – a critical method of postcolonial computing that fully engages the "global periphery" without western influence – is the best current option with room for dialogue.

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Human-Computer Interaction (HCI), a subfield of human-factors and ergonomics, seeks to understand the design of technology-based systems. Consequently, students of the field may find themselves studying disciplines that seek to understand humans such as psychology, sociology, and ethnography (Rogers, 2012). But what if this research is being largely influenced by one culture? Does this effect the resulting designs, satisfaction, and usability among these "other" users? Are there other methods that can mitigate this problem?

This paper will explore these questions as they relate to the West or the western world. In this context, the West refers to the nations, states, people, and cultures that make up North America, Europe, and Oceana, especially those that have a long-standing history of colonizing the non-western world. It will demonstrate how the West's colonial history has afforded it a controlling interest in the design standards and research methods developed in the field of HCI and its use in non-western contexts. It will also methodologically discuss research methods and theories that can counteract this influence. These theories include Hofstede's theory of cultural dimensions, postcolonial computing, decolonial computing.

By the end, a best method may either present itself or be made more unclear and left to the context and biases of the researcher. Regardless, western culture's true influence on HCI research methods will be made evident and potentially better, more inclusive, and empowering methods determined.

History

Starting in the 16th Century, Great Britain began its empirical expansion, establishing their rule in North America and The West Indies (Encyclopaedia Britannica, 1998a). By 1922, the Great British Empire was the largest in the world expanding over a quarter of the Earth's surface and by 1942 Great Britain

along with other western powers such as Belgium, France, and Italy had dominated 80% of the world. (Kane & Groark, n.d.; Stoller-Conrad, 2015)

Within these colonies, indigenous peoples were assimilated into the culture of their ruling country, losing their language, religion, and customs (Blakemore, 2019). This type of rule carried on for centuries and was so pervasive that even after the colonized nations began to establish their independence and freedom from imperialism, their societies had changed in irreversible ways. For instance, many of Africa's country borderlines were set by the division of the continent by European imperialists (Encyclopaedia Britannica, 1998b). Many countries continue to experience inequalities and stunted economic development (Kane & Groark, n.d.). Moreover, a conventional system was established in which the world views the West as a central figure and everything else as "periphery" (Ali, 2016). In other words, western ideologies became the standard to which everyone conforms.

Take, for example, world maps. Most world maps found in a classroom are Mercator maps, charted by Geert de Kremer (also known as Gerardus Mercator) in 1569. Mercator, a globe-maker, designed this projection for sailors to help them navigate by drawing longitudinal and latitudinal lines as straight lines that cross at right angles. (Morlin-Yron, 2017). This adaptation produced a map in which many continents were drawn out of proportion, with the landmasses of North America, Europe, and eastern and northern Asia appearing much larger than South America and especially Africa which is considerably larger than them all (Wan, 2014). Whether or not Mercator's true intent was to diminish the size and significance of Africa and its nations remains up for debate, but its effects remain the same: the Mercator map projection was created *for* the West *by* the West, and other countries had to adapt as the map became the standard (Morlin-Yron, 2014).

Foundations of HCI and The West

Human-Computer Interaction (HCI) began its infancy in the 1980s. Soon after, its conferences were organized throughout Europe (Dix, 2017). Similar conferences based in the non-western world

such as AfriCHI and ArabHCI weren't established until the late 2010s (*Proceedings*, n.d.; *The Community*, n.d.). Up until then, the consideration for research and design in non-western contexts could have only come from western contexts whose goals were to develop for the western context. As Philip et al. (2012) put it, "There is no modernity without colonialism...then it follows that computing is necessarily colonial insofar as it is modern."

Many of the most important contributors to HCI are from the West and the standards and methods they've developed are created for that context. German psychologist defined the Gestalt Principals that are used to organize content in an interface. While these principals are considered "human" laws and should apply to any human regardless of culture, the cultural context for which they are applied can make a difference. The Carpentered-World Hypothesis[1] is an example of this.

Likewise, American researcher and author of the "watershed" book *The Design of Everyday Things*, Don Norman co-founded the Nielsen Norman Group, a popular and equally authoritative UI/UX consulting firm, with fellow HCI Dutch researcher Jakob Nielsen (*About Nielsen Norman Group: UX Training, Consulting, & Research*, n.d.). As the proclaimed "guru" and "king" of usability and as the coiner of the term "user experience" both Nielsen and Norman respectively have contributed much to how we understand usability in HCI (*About Nielsen Norman Group: UX Training, Consulting, & Research*, n.d.; Apai, 2009). But as Chetty & Grinter (2001) argue, it has its limitations. Traditional useability evaluation methods assume a high baseline from which the technology can be considered usable at a minimum and tries to surpass that. But when designing for a developing world with limited infrastructure any functional technology can be considered useable when compared to no technology.

The Problem

[1] Americans and Europeans who live in a "carpentered-world" filled with right angles and straight lines are more susceptible to and have heuristics for identifying them when they are projected on flat surfaces, than people of tribal cultures who live in non-carpentered environments (Barthelme, 2009).

Thus, we arrive at the problem with western researchers developing methods and naively applying them to non-western contexts: disempowerment (Wyche et al., 2015). When western researchers employ research participants from non-western or developing nations an embedded power dynamic reminiscent of the relationships seen during colonialism resurfaces (Lazem et al., 2021). While unintentional and non-malicious it may lead to the indigenous peoples feeling disempowered or at least unwary in the study, and therefore providing responses that the researcher may want to hear instead of giving their true impressions, if they say much at all (Oyugi et al., 2008). It also has the effect of purporting "Western knowledge" to be the dominant, while local knowledge is secondary. This goes beyond even the immediate study to its reviewers. Bidwell (2016), Buskens and van Reisen (2017), and Mawere and Awuah-Nyamekye (2015) discovered that,

> Most Western reviewers make use of their knowledge, experiences, attitudes, values, and norms to validate the work from indigenous researchers. This contributes to the ethical paradox that sees local knowledge, valued by local researchers, in reality undermined, devalued, and omitted in order to conform to the reviewers' worldview, further perpetuating the behaviour that assumes 'real knowledge producers' to be in the Global North, with the South seen as 'deliverers of information' (as cited in Lazem et al., 2021).

In other, more explicit forms of disempowerment, the needs of the local people are blatantly ignored in favor of more universal designs that require less effort to adapt to non-western contexts. In a case study performed by Irani et al. (2010) a "health care NGO" called HealthWorks wanted to reduce water-borne illness among impoverished Indians with the development of commercial water filters. After first broadening their image of poverty in India to find qualifying user study participants due to many of the Indians not fitting their description of sick, sad, and ashamed, Healthworks discovered that their complaints were centered around the over-fluoridation of the well-water rather than illness. This was not a problem that filters could fix and Healthworks ultimately decided not to pursue it because it

was a localized problem that would require a longer and localized design and development cycle that could not be universally applied to other contexts.

Researching for Non-Western Cultures

Nevertheless, the world of HCI is not blind to the needs. As the field has progressed in a world that has become increasingly more sensitive to the long-lasting effects of colonialism, more inclusive methods have been developed, seeking to consider at worst, and empower at best voices once ignored.

Hofstede's Theory of Cultural Dimensions

According Alsswey & Al-Samarraie (2021) Hofstede defined culture as "a combination of certain beliefs, customs, values, and attitudes that distinguish individuals of one group from another." Hofstede used culture to categorize groups of people by their differences and values. After completing a study of 53 countries between 1968-1972, Hofstede developed six dimensions across which national cultural characteristics or alignment can be identified (Gould & Marcus, 2000; Alsswey & Al-Samarraie, 2001):

1. Individualism vs Collectivism – refers to whether priority is given to the individual over the group.
2. Power Distance – refers to the unequal division of power among members of a society and how agreeable the members of less power are to this dynamic.
3. Uncertainty Avoidance – refers to a society's propensity to avoid situations whose outcome may be unknown.
4. Masculinity vs Femininity – refers to the assumed gender roles of a society, where in masculine societies traditional roles are maintained, and in feminine societies these roles are blurred.
5. Long-term vs short-term orientation – refers to whether a society tends to withhold short-term success or pleasure for long-term gain or the inverse.

6. Indulgence vs restraint – "related to gratification versus control of basic human desires related to [the] enjoyment of life."

These dimensions can then be used to inform design decisions. Gould & Marcus (2000) discussed how Hofstede's dimensions can be used to inform interface design. Considering the level of individualism of a society for example may affect how or if designers choose to collect personal information as collectivist societies may be wary of distinguishing themselves from the group (Gould & Marcus, 2000). Alsswey & Al-Sammaraie (2001) went a step further by mapping the dimensions to UI components (message, images, language, layout, color, etc.), hypothesizing that the two can influence usability and satisfaction among users. They used Hofstede's theory to design a web UI for Arab users and analyze its performance and their results found high satisfaction among users in the UI's layout, use of colors, symbols, and icons, and more. The tensions that were discovered were due to preferences based on age.

Unfortunately, while listing the limitations of their study, Alsswey & Al-Sammaraie (2001) noted that "the proposed guidelines may not provide a full picture regarding the relationship between culture and design of UI in Arab countries." This seems to be an oft-noted problem among those who challenge Hofstede's methods (Irani et al., 2010). Additionally, this and other taxonomic methods suffer from assuming a universal "here" from which "other" cultures can be analyzed from a disconnected point of view (Irani et al., 2010). Critics, especially those that are proponents of postcolonial computing, claim that Hofstede's methods view culture a statically acquired thing that is shared by individuals of a geographic nation. This generalization doesn't allow the culture to which individuals may subscribe to change and grow over time. It also sets technology apart from culture as if it is only influenced by and is not directly apart of culture itself (L. C. Irani & Dourish, 2009; Philip et al., 2010). While this makes culture more amenable when trying to adapt long-standing research methods, it's too inflexible and is not reflective of people's realities especially as it pertains to technologies. Ultimately, Hofstede "has

promoted and perpetuated a cross-cultural view from a Western standpoint," (Winschiers-Theophilus & Bidwell, 2013).

Postcolonial Computing

Postcolonial computing takes a more nuanced approach in addressing cross-cultural research and design. Postcolonial computing derives its philosophies from postcolonial studies which seeks to understand how interactions with disparate cultures is affected by the long-lasting political, economic, and authoritarian effects of colonialism (Wyche et al., 2015). Postcolonial computing therefore investigates this dynamic as it relates to HCI and design methods (Ali, 2016). It attempts to break past the colonial ideologies embedded in universal Western thought that taxonomic methods fall prey to. Philip et al. (2012) summarized how it does so in three main ways: (1) It challenges the idea of western designs being inherently distinct from non-western designs and embraces the differences between the two as a source of creativity. (2) It strives for translation of "ways of life into technological needs" over adaptations of Western design methods. (3) Finally, it's focus is not just on the design of technology systems, but on the underlying forces that influence design methods and how they may change.

In fact, Philip et al. (2012) goes on to describe the tactic as "a way of asking questions" rather than a true theory. It's not seeking to create or suggest an end of any kind, especially of colonialism, but providing a method of conduct when encountering or interacting with non-western contexts (L. Irani et al., 2010; Philip et al., 2012). For example, postcolonial computing may investigate such questions in their research as: How has the way in which postcolonial authorities have challenged and claimed power affected how local people contest and make decisions? How is team building affected by the ways in which locals have dealt with conflict? Can a culture be changed with the importation of "'best practice' processes such as structured brainstorming" (L. C. Irani & Dourish, 2009)?

Some researchers, such as Wyche et al. (2015), have seen this form of cross-cultural design inquiry prove fruitful in helping them redesign cell phones for rural Kenyans. They spoke with cell phone

repairers in the area who were familiar both with the phones used by the locals and how they typically break. The key to their research was to meet them on their terms, as postcolonial computing encourages, and in doing so they found that their designs were not any different from what Westerners seek in their cell phones, proving an ideology firmly held by other postcolonial computing advocates. Supporters also agree that postcolonial computing creates a more sustainable design environment between western researchers and non-western users as it attempts to shift from the idea "designing *for"* to "designing *with"* end users by giving the users a voice and the researchers a true understanding of their needs (L. Irani et al., 2010; Wyche et al., 2015).

However, even Wyche et al. (2015) notes in their study that postcolonial computing isn't without its flaws. Despite its efforts, the power-dynamics created colonialism cannot be completely escaped. All the researchers participating in the study where White Europeans who had to have their participants words translated to English, "paying homage", as they put it, to the colonizers. Likewise, whatever ideas and thoughts that were exchanged by the researchers and participants would still ultimately be interpreted through a western lens.

Possibly more ethically controversial is the ownership of ideas and participant compensation which can preserve colonized attitudes if not addressed (L. Irani et al., 2010; Lazem et al., 2021). If the design is developed while in partnership with the participants, as was Wyche et al.'s case, who is the owner of the intellectual property? Does compensating the participants with money further aggravate these power dynamics? Is there way to make the relationship between western researchers and non-western participants truly mutually beneficial?

Decolonial Computing

Perhaps decolonial computing, the final method discussed here, addresses these questions. As previously stated, colonialism instituted a Euro-American core in which non-western contexts are

stationed at the fringe. If taxonomic research methods are upheld by this precept, and postcolonial computing perpetuates it, then decolonial computing attempts to dismantle it altogether.

Decolonial computing is arguably the more radical and controversial of the three methods discussed as it examines the intersection of race and computing (Ali, 2016). Its goal is to give the global "periphery" a voice unfiltered by western universal thought (Ali, 2014). As a growing method, it models ways to overcome what may be considered postcolonial computing's biggest shortcoming: its "Eurocentric critique of Eurocentrism" (Ali, 2016).

Chan (2018) calls this removal of oneself as the center of knowledge "decentralization" and describes it as the pivotal concept that sets decolonial computing both apart and ahead of postcolonial computing. Another critical task of decolonial computing is to consider the "body" and "geo-" politics of a paradigm (Lazem et al., 2021). Because of decolonial computing's illumination of the global fringe, it cannot be viewed as a race-less method, and it is decidedly non-Eurocentric (Ali, 2014). With this method, it is important that researchers understand the origins of who they are studying and stay in constant criticism of their own viewpoints as they change. In doing so, indigenous ideologies are championed while that of Europe and America are decentralized, and colonial practices are actively combatted (Lazem et al., 2021).

There are paradoxes in implementing these strategies. For instance, legitimizing indigenous ideologies without relying upon colonial constructs. While planning AfriCHI using decolonial computing to better edify African identities within HCI discourse, Bidwell (2016) found that reliance upon the support of ACM SIGCHI, Association of Computing Machinery special interest group on HCI, to boost its credibility did not necessarily ensure any of the sponsorship typical of this association. This created a power dynamic resembling dominion and may be related to the "ethical paradox" described by Lazem et al. (2021). They describe this paradox as the persistent power-dynamic that appear when "local researchers pursue decolonization endeavors via Western projects." Other paradoxes highlighted by

Commented [JS1]: Removed: Non-western employers of decolonial computing can also reap the benefits of it's philosophies. Chan (2018) cites how some collaborative networks in Latin America have brought together diverse community groups to work together using decentralizing practices for decades before decolonial computing became a formal practice itself. In their work they neither assume a universal worldview, nor look for some new uniting "centralizing force." Instead, they look forward building the new future technology by relating through their differences.

Commented [JS2R1]: Planners of AfriCHI employed decolonial computing in order to edify African identity in HCI (Bidwell, 2016). Bidwell (2016) discusses how the suppression of African identity in HCI discourse is often embodied. It reveals itself in the humble, often impoverished and/or illiterate portrayal of Africans as passive recipients of HCI's developments with little representation from the educated and actively participating middle-class. The scientist and researchers who are recognized are relegated to subservient positions such as data collectors, yielding their knowledge and expertise to researchers from "developed" regions, with few opportunities for upward mobility. Changing this dynamic required decolonizing the standard HCI conference piece by piece. "Citation apartheid" is combatted by encouraging researchers champion African research and authors in their own work. Language politics are improved upon by localizing the language to the mother tongue of the host location and broadening the use of English to any form that feels meaningful to it's user. Finally, among other strategies, "[d]iverse African practices and perspectives" are made a necessary part of design review and creation Bidwell (2016).

Lazem et al. (2012) includes the “terminology” and “micro-colonisation” paradox which debates the problem with the explicit use of the term decolonization and whether as a method it is too engrossed in the past respectively.

Conclusion

Still, it can be argued that the true benefit of decolonial computing is that it keeps open a once non-existent dialogue around how to best regard non-western ideologies in HCI in such a way that doesn’t just put these ideologies first, but returns autonomy to their owners. Hofstede’s theory of cultural dimensions never even considered them as a potential option, and postcolonial computing, while making a great attempt through direct collaboration with the global periphery, seems too reluctant still to give them full control and does not assume any responsibility for the disempowering creations of the past (Ali, 2016). No method will solve this problem perfectly, but decolonial computing appears to have gotten the closest by allowing the non-western epistemologies take the lead after being forced to wait in the shadows for centuries. Thus, if a researcher’s goal is to inform a universal design from their own viewpoint that can be adapted to fit any culture broadly, taxonomic methods such as Hofstede’s will fit their needs. Should the researcher want to take more responsibility in recognizing the role colonialism may have *once* played in the development and current standing of a non-western (and especially developing) culture and how it may color their interactions with that culture, then postcolonial computing can provide that much. But in answering the question of how non-western, marginalized voices can be elevated in a globalized world cultivated by centuries of colonialism and neo-colonialism, decolonial computing provides a more complete solution and should be used in most cases. It is not enough to be a researcher in HCI and continue with the status quo of research. Studying humans and their engagements with technologies requires understanding everything that has, is, and can influence that human and their engagements. Ignoring a major part of global history in this regard or not attempting to make restitution would be irresponsible.

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