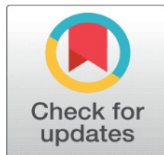


THE COMING OF PRINT: THE ROLE OF MISSIONARIES AND COLONIALISM IN SHAPING A NEW MIZO IDENTITY

Michelle POA¹, Binu Sundas²

¹Scholar at Center for the Study of Social Systems, Jawaharlal Nehru University, New Delhi, India

²Assistant Professor, Department of Sociology, Miranda House, University of Delhi, India



Received 28 August 2025

Accepted 29 September 2025

Published 31 October 2025

DOI

10.29121/ShodhSamajik.v2.i2.2025.30

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Copyright: © 2025 The Author(s). This work is licensed under a [Creative Commons Attribution 4.0 International License](#).

With the license CC-BY, authors retain the copyright, allowing anyone to download, reuse, re-print, modify, distribute, and/or copy their contribution. The work must be properly attributed to its author.



ABSTRACT

This paper explores the transformation of Mizo identity through the transition from orality to print in the Lushai Hills. It traces the profound cultural shifts initiated by British colonialism and Christian missionary intervention in the late 19th century. Traditionally, Mizo society relied on oral narratives, communal storytelling, and performative rituals to transmit memory, knowledge, and values. The arrival of missionaries such as J.H. Lorrain and F.W. Savidge marked a pivotal moment, as they not only introduced Christianity but also formal education and print technology. This transition inaugurated a new epistemological order, replacing oral cosmologies with written scripture and modern texts, and fostering the emergence of a distinctly Christian-Mizo identity.

By examining key themes—including the replacement of oral traditions, the ideological role of print, and the reconfiguration of historical consciousness through works like Mizo Chanchin Laisuih- the paper investigates how Mizo identity was reshaped through a fusion of indigenous and Western worldviews. It argues that this transformation was not merely one of cultural erosion but a negotiated rearticulation of identity that integrated Christian faith, colonial governance, and modern textual practices

Keywords: Oral Tradition, Print Transition, Mizo Identity, Lushai Hills, Missionaries, Colonialism, Christianity

1. INTRODUCTION

The Mizo people, a Tibeto-Burman ethnic group, primarily inhabit the state of Mizoram, which, with a population projected at 1.25 million as of mid-2024, has one of the highest proportions of Scheduled Tribes in India. The state's literacy rate is exceptionally high, at 98.2%, making it the first fully literate state under the ULLAS initiative, with a notably small gender gap in literacy. Christianity is the dominant religion, practiced by over 87% of the population, with Protestant denominations being most prominent. The sex ratio is favorable at 976 females per 1000 males, higher than the national average. While a large portion of the population has urbanized, especially in the capital Aizawl, many Mizos in rural areas continue to practice jhum (slash-and-burn) agriculture, which remains a key part of their

cultural and economic heritage [Mizoram population 2025 | Sex ratio and literacy rate 2025](#). (n.d.)

The history of the Mizo people in the Lushai Hills (now Mizoram) is one deeply rooted in oral traditions, communal storytelling, and performative cultural practices. For centuries, the transmission of knowledge, values, and history was carried through song, folklore, and collective memory rather than through written records. According to Mizo oral lore, the Mizos came from Chhinlung, meaning 'covering rock'. The legend goes on to say that the Mizo people, belonging to various clans, emerged from the earth beneath the stone [Pachauau \(2017\)](#). This is just one of the many myth/stories regarding the origins that exist among the Mizos. Such stories underscore the centrality of orality and transmission through memory among the Mizo people.

However, with the advent of British colonialism and the arrival of Christian missionaries in the late 19th century, a seismic shift occurred in the Mizo cultural and intellectual landscape. The missionaries, particularly J.H. Lorrain and F.W. Savidge, not only brought Christianity but also introduced print and formal education to the region.

There were significant observable changes in the Mizo society due to this encounter. The transition from orality to print, coupled with the consequences of missionary interventions as well as changes brought about by the coming of colonialism reconfigured Mizo identity and morality. The print revolution that these people encountered was not only technological but also ideological. It facilitated a new textual order and contributed to the emergence of what is called a 'Christian-Mizo' identity [Pachauau \(2014\)](#).

The paper traces the trajectory of this transformation by examining relevant themes such as the transition from oral to print culture in the Lushai Hills, the critical role played by Christian missionaries, the combined effects of Christianity and colonialism on Mizo texts and identity, the construction of a new historical consciousness through texts like Mizo Chanchin Laisuih; and the emergence of a modern Mizo identity.

2. LITERATURE REVIEW

Contemporary scholarship has begun to challenge earlier rigid binaries between orality and writing. [Albert Lord \(1960\)](#) had famously denied the possibility of "transitional texts," claiming that oral and literate techniques were mutually exclusive. However, this position has since been revised. As [Ford and Gintsburg \(2020\)](#) argue, emerging evidence from cultures undergoing literacy transitions points to the coexistence and creative interweaving of oral and literate practices. Their concept of the "transitional text" revitalizes how we interpret societies like the Mizos, who experienced a sudden and state-mediated shift from oral to print traditions.

[Pachauau \(2014\)](#), in 'Being Mizo', examines how Christian conversion and colonial discourses reshaped the collective memory of the Mizos. She demonstrates how new textual practices, historical writing, and missionary documentation led to the selective remembrance of pre-Christian traditions and the reframing of Mizo identity within a Christian moral framework.

[Thirumal and Lalrozami \(2010\)](#) further observes that the coming of print was more than just a neutral technological advancement, rather, it marked a cultural and epistemic shift and redefined not only how knowledge was stored and transmitted but who had the authority to produce it. The challenge, therefore, is not simply to

document this change, but to critically assess how the dominance of the written word reshaped power, identity, and memory in Mizoram.

Furthermore, [Pachau \(2017\)](#) focuses on the dynamics of orality, emphasizing that oral narratives in Mizo culture were more than just forms of storytelling- they were performative, situational, and dialogic. She argues that the transition to written form empowered the textual, with fixed meanings replacing fluid interpretation.

These existing scholarships provide a robust foundation for understanding the transformation of Mizo society through the twin forces of colonialism and Christian missionary activities. One of the key contributions have been the challenge posed to simplistic binaries between orality and writing, framing the shift to print as a complex, culturally negotiated process. New avenues have opened up for analyzing how oral and written modes coexisted and interwove during times of rapid cultural change.

However, several gaps remain. Much of the existing literature either treats orality and print as separate episteme or focuses primarily on macro-political processes such as colonial administration and Christianization. There is limited exploration of how specific texts like Mizo Chanchin Laishuih (MCL) functioned as hybrid, transitional artifacts that simultaneously inscribed, negotiated, and transformed indigenous worldviews. The introduction of MCL, with its standardized language and wide-ranging content, laid the groundwork for a new communal consciousness. It enabled the Mizo people to begin to imagine themselves as a single, unified community beyond their immediate kinship or clan, a critical step toward the political consolidation of a Mizo nation-state [Thirumal and Lalrozami \(2010\)](#). Moreover, the affective and embodied aspects of cultural transition (e.g., singing traditions like Puma Zai) remain understudied in terms of their role in mediating the oral-print interface.

This paper seeks to bridge these gaps by focusing on the material and performative dimensions of the transition from orality to print in the Mizo context. It examines how Mizo identity was not only shaped by external forces but also actively rearticulated through internal, culturally specific practices. In doing so, it contributes a grounded, interdisciplinary analysis that emphasizes entanglement, negotiation, and the co-presence of oral and textual modes within the formation of a new Mizo identity.

3. FROM ORALITY TO PRINT: THE ROLE OF CHRISTIAN MISSIONARIES

Prior to colonialism, oral traditions constituted the backbone of social knowledge and memory of the Mizos. Songs, chants, and myths transmitted values, historical events, and genealogical information. These forms were deeply integrated into social institutions like the zawlbuk - a communal dormitory where young men were trained in warfare, community duties, and cultural knowledge [Thirumal et al. \(2019\)](#). Knowledge was circulated through proverbs, legends, war chants, and folk songs that were performed during community gatherings. The zawlbuk- a central institution in every village, played a vital role in preserving and disseminating this knowledge. Young men would gather here to learn the skills of adulthood, hear stories from elders, and engage in communal life. The zawlbuk thus functioned as both a social and educational institution, reinforcing tribal values and shared memory.

There was no written script or tradition of record-keeping. History was remembered through retellings, and the authenticity of a narrative was often verified through communal agreement. Myths and genealogies were key to establishing social status and legitimacy, and these were passed down orally across generations. Such oral systems were dynamic, adaptable, and deeply embedded in the rhythms of daily life.

Margaret Pachuau emphasizes that Mizo oral narratives were fluid, collectively owned, and performed for specific audiences and occasions [Pachuau \(2017\)](#). The relationship between human and animal was also an integral part of the oral worldview, often illustrated through rituals around hunting.

The late 19th century marked a turning point with the arrival of two Welsh missionaries, J. H. Lorrain and F. W. Savidge, who introduced the Roman script in the Lushai Hills in 1895 [Pachuau \(2014\)](#). The arrival of missionaries was a transformative event that profoundly reshaped Mizo society, culture, and identity. The consequences of their work extended far beyond the introduction of a new religion, initiating a fundamental shift from an oral to a print-based culture and laying the groundwork for a new, unified identity. The primary and most immediate consequence was the invention of a written script for the Lushai language. Lorrain and Savidge undertook the immense task of transcribing a language that existed only in oral form. They chose the Duhlian dialect, spoken by the politically dominant Sailo clan, from among the twelve dialects in the region. Their work culminated in the publication of the first Lushai Grammar and Dictionary in 1898 and the translation of key Biblical texts like the Gospels of Luke and John [Thirumal and Lalrozami \(2010\)](#).

Following the introduction of a script, one interesting development that emerged very early on was the need the Mizos felt to record their past. The primary motivation was to legitimize their existence as a distinct people. As one of the early Mizo historians, Rev. Liangkhaia, noted, while people read the histories of other nations, there was no written history of the Mizos [Pachuau \(2014\)](#). Having a written narrative of their past was a way to make them "equal" to other groups and served the purpose of validating their belief that they were a legitimate Nation.

This desire to create a written history was also a direct consequence of the colonial and missionary context. The Mizo people had internalized the belief that the written word was more authoritative than oral traditions. This led them to formalize their origin myths, moving from fluid oral narratives to a more uniform, single-story version that was considered acceptable to the "scientific" demands of the age [Pachuau \(2014\)](#).

The practice of recalling and sharing stories from the past was already well-established among the Mizos, and many took a genuine interest in preserving these narratives. What marked a departure from tradition, however, was the shift toward recording these oral accounts, especially foundational myths such as those concerning origins, in written form. This act of documentation led to the standardization of stories, which in turn had significant consequences for how the Mizos came to understand and define their collective identity. [Pachuau \(2014\)](#). This enabled existing stories to be arranged in a pattern and it is in the pattern where the meaning of the stories now lay.

The very first printed texts in Mizo were religious in nature: translated portions of the Bible, hymns, catechisms, and prayer books. These texts were printed using hand-operated presses and distributed through missionary schools and churches [Thirumal and Lalrozami \(2010\)](#). The development of print was thus intimately tied to the goals of Christianization. Literature was not taught in isolation; it was always

embedded within a Christian framework. The establishment of the first printing press in Aizawl in the early 20th century further accelerated the production of Mizo-language materials [Mizoram Presbyterian Church. \(2024\)](#). In a span of a few decades, the Mizo people transitioned from a purely oral society to one that was increasingly defined by literacy, schooling, and the printed word.

The development of a script and the spread of print culture should not be seen as mere acts of translation but as acts of transformation. Mizo Chanchin Laishuih (MCL), first circulated in 1898, is a key text for this transformation. MCL represents a significant milestone in the development of Mizo print culture. As the first handwritten newspaper in the Mizo language, it played a pivotal role in shaping historical consciousness and collective identity. The publication combined oral narratives with written accounts, creating a new form of historical documentation that blended traditional storytelling with Western historiographical methods [Thirumal and Lalrozami \(2010\)](#).

[Thirumal and Lalrozami \(2010\)](#) argue that MCL functioned as an extension of the colonial state, aiding in governance, moralization, and ideological control. It displaced oral forms like the tlangau (village crier), transformed animals like the tiger into colonial commodities, and redefined ritual through Western medicine. For instance, the publication reported on the colonial official, "BorSap," offering rewards for hunting tigers and bears. This initiative transformed hunting from a traditional, voluntary activity to attain the status of thangchhuah (an honourable man) into a coercive activity undertaken to clear the forests for the convenience of the colonial state. Moreover, MCL documented practices related to hunting and healing, but in doing so, it juxtaposed traditional Mizo rituals with new colonial interventions. The newspaper reflected the clash and negotiation between old and new by featuring the priest's chant alongside the numbed apothecary of the newly arrived 'Doktor Sap'. The Doktor Sap represented a new regime of "human management" embodied by the hospital, which challenged the authority of traditional healing practices mediated by the puithiam (village priest).

Importantly, the stories of hunting published in MCL reveal a profound cosmological rupture. The hunted animal was no longer a spiritual companion but a monetized good. This marks the commodification of the spiritual. MCL illustrates how the sanctity of oral cosmology gave way to the authority of the written word, changing how meaning was created and circulated in society.

4. COLONIALISM, CHRISTIANITY AND THE TRANSFORMATION OF MIZO TEXT AND IDENTITY

Before British colonial rule, the Mizo people led a free and socially cohesive life, guided by a lack of a single central authority and the traditions of animistic rituals and headhunting. At the core of this society was the institution of chieftainship, where each village was overseen by a chief. The chief acted as a guardian and protector, responsible for the community's overall welfare and binding the entire village into a unified collective. In addition to chieftainship, two other core pillars provided social solidarity in the pre-colonial Mizo tribal structure. The first was Tlamgaihna, a customary code of ethics that served as a guiding principle for every Mizo to be brave, courteous, and decent, and to willingly offer services for the public welfare. The second was the Zawlbuk, a bachelor's dormitory. This institution functioned as a social platform and training ground where young men learned community services such as defence, disaster management, and other public welfare activities [Purkayastha \(2019\)](#).

Colonialism significantly altered how identity was perceived and constructed in Mizo society. With the arrival of Christianity, the traditional markers of identity began to shift. Over time, religious affiliation became central to how Mizos defined themselves, leading to a gradual transformation in the cultural framework of the community. [Pachau \(2017\)](#) observes that this reorientation brought a sharper focus on Christian values and religious identity, often at the expense of indigenous narratives.

This transformation was not neutral- it entailed the systematic sidelining of oral traditions, folk tales, and mythic lore that had once been vital in shaping Mizo worldviews. As religious identity gained prominence, pre-Christian forms of cultural expression were increasingly devalued or suppressed. This process can be understood as a form of cultural erasure, wherein the legitimization of Christian morality coincided with the marginalization of local cosmologies and collective memory.

In effect, colonization and Christianization did not merely introduce new belief systems, they redefined what it meant to be Mizo. The coming of Christianity and print radically altered the nature of Mizo textuality. Whereas traditional knowledge was communal, performative, and dynamic, Christian texts introduced fixed meanings, standardized interpretations, and authoritative voices. The Bible became the central text around which religious, ethical, and even political life revolved. Hymns and sermons began to replace folk songs and oral epics [Pachau \(2014\)](#). The zawlbuk system declined, and with it, the communal modes of learning that had defined Mizo society.

Education, now framed within missionary schools, privileged certain forms of knowledge over others. Western-style schooling introduced concepts of individual authorship, historical linearity, and textual authenticity- ideas that were foreign to oral cultures. The notion of a singular "truth" as embodied in the Bible displaced the plural and performative truths of oral storytelling. Over time, Christianity became deeply ingrained in Mizo identity, not only as a faith but as a cultural framework.

Colonial policies further supported this transformation. The British administration encouraged the spread of missionary schools and viewed the Christianized, literate Mizo as a more governable subject. The state and the church often worked in tandem, with missionaries reporting to colonial officers and vice versa [Thirumal and Lalrozami \(2010\)](#). This nexus of Christianity and colonialism created a powerful apparatus for reshaping Mizo society.

Christianity and colonialism collaboratively restructured Mizo epistemologies. Pre-Christian practices were condemned as primitive, while Christian ethics became central to new historical narratives. The core argument to condemn them as primitive was the belief that embracing Christianity required a complete exit from previous faith cultures. Missionaries and early converts viewed traditional religious and social practices as anti-Christian and incompatible with the new faith. For instance, pre-colonial Mizo society was based on animistic rituals, and headhunting was a significant practice. Traditional hunting was not just a subsistence activity; it was a ritualistic act to attain the status of *thangchhuah* (an honourable man) and for the slayer to gain power over the spirit of the animal or foe in the afterlife. The colonial state, through its administrative tools, began to redefine these practices. For instance, MCL impertinently referred to the revered tiger as a common cat, a subtle effort to desacralize indigenous animistic beliefs and instil a new, rationalist view of the animal world [Thirumal and Lalrozami \(2010\)](#). As [Pachau \(2014\)](#) argues, the past was rewritten to fit a redemptive Christian model. Print reinforced this by giving authority to documented history and marginalizing oral lore.

Colonialism commodified previously sacred aspects of Mizo life. For instance, animals once imbued with cosmological value were taxed, priced, and commodified under colonial policies. The ritual and symbolic aspects of hunting were replaced by economic rationality. Hunting stories in Mizo Chanchin Laishuih reflect this shift—documenting the hunt in written form with the animal as a commodity rather than a spiritual entity. This period also saw figures like Suaka, who rose to the status of Chief despite not belonging to the Sailo lineage, demonstrating the internal reconfiguration of social hierarchies in response to colonial structures [Thirumal and Lalrozami \(2010\)](#). Thus, colonialism reshaped cosmologies, societal practices, and worldviews.

5. THE PUMA ZAI MOVEMENT

Colonialism and christianity became a dominating factor in the Lushai Hills, penetrating almost all aspects of the life of the Mizos. Nonetheless, the Mizos were also not passive recipients. They adapted and reinterpreted Christianity in their own ways and some even raise oppositions against its practice. [Pachau \(2014\)](#) notes that an important facet of Christianizing in the Lushai Hills was a particular kind of opposition, which in turn had its impact on the way Christianity came to be practiced. The opposition came in the form of a mass upheaval induced by what was known as puma zai, which was accompanied by an all-embracing chant and dance known as tlanglam zai (community dance and song). It began in 1908 and became a movement that encompassed the whole region. The movement was associated with the singing of some couplets, which usually had the refrain 'puma' at the end of each line. It was not so much the lyrics of the song that mattered, for they were more or less frivolous exchanges, but the fact that the singing was accompanied by drinking and dancing in which the entire village would end up in a state of drunken revelry [Pachau \(2014\)](#).

The Puma Zai movement, which swept through the Lushai Hills from 1907 to 1911, was a profound act of cultural resistance that directly challenged the new Christian order and its accompanying print-based epistemology. The movement did not merely present an alternative; it did so in a way that was fundamentally at odds with the rational, textual reality the missionaries sought to establish.

The Puma Zai movement directly challenged the authority of the church by operating outside of its control and embodying a pre-Christian past that missionaries demanded converts exit from. The movement's essence was a form of a "travelling musical theatre" that was raunchy, loud, and ecstatic. This was a direct counterpoint to the theatre of the intelligible, rational, predictable and the ocular" that was being introduced through print culture and missionary teachings [Thirumal et al. \(2019\)](#).

In puma zai songs, more emphasis is given to the performance aspect of it rather than the textual aspect of it. Thus, initially critiquing British authority and mocking colonial culture, zai songs reflected a form of cultural inversion. Politically subjugated, the Mizos asserted cultural superiority through rhythm, satire, and song. The zai became a mass cultural movement by the 1920s, often merging with Christian conversion and collective singing in churches. These embodied, multi-sensorial forms of worship (singing, dancing, and feasting) integrated pre-Christian and Christian modes of expression. According to [Pachau \(2014\)](#), puma zai had come close on the heels of the first revival movement.

The movement's widespread popularity and its ability to cause apostasy led missionaries to view it as a significant threat to their authority. The convulsive,

uncontrolled nature of the performances were seen as a commotion that threatened law and order. This spiritual fervour was seen by missionaries as a challenge to their control, even fearing a split in the church over its manifestations.

Moreover, the Mizos also created hybrid forms of worship and literature. Over time, a distinctly Mizo Christian textual tradition emerged, one that sought to preserve certain elements of oral culture while embracing the possibilities of print.

6. CONCLUSION: THE EMERGENCE OF A NEW MIZO IDENTITY?

The notion of identity has consistently been a subject of debate within global discussions surrounding society, culture, and politics. Its inherent ambiguity and the diversity of its interpretations have made it a persistent topic of scholarly inquiry. In contemporary, multi-ethnic social and political contexts, the urgency to assert one's identity within broader group frameworks has only intensified. As such, revisiting and critically engaging with the concept of identity remains essential for understanding its implications in sociopolitical and cultural studies.

Understanding the concept of identity and its various implications therefore requires moving back and forth between the past and the present. Questions related to identity include the recovery of one's past and the understanding of that past in the creation of that identity [Pachau \(2014\)](#). This is especially relevant in the case of the Mizo people, whose identity has been shaped by a range of historical factors, including clan and village-based governance structures, colonial domination, ethnic conflict, and the encounter with external cultural ideologies. The evolution of Mizo identity, therefore, reflects an ongoing negotiation between indigenous traditions and Western influences [Zarzosanga \(2021\)](#).

The transformation of Mizo identity is rooted in the profound changes brought about by colonial rule, Christian missionary activity, and the rise of print culture. In the pre-colonial era, identity was localized and shaped by clan affiliations and village-level governance. There was no collective sense of being "Mizo" beyond one's immediate sociopolitical unit. The colonial annexation of the Lushai Hills, however, disrupted this structure. With the introduction of fixed territorial boundaries and centralized administration, a broader ethnic consciousness began to emerge.

Christianity further accelerated this redefinition. Initially met with resistance, it gradually became central to Mizo life. Christian morality and discipline replaced older cosmologies, and being Mizo came to be understood as being Christian [Pachau \(2014\)](#). This identity shift was not only religious but also epistemological. The oral traditions that once structured memory and knowledge were replaced by textual narratives shaped through missionary education and print media. The Christian Church became both a spiritual and cultural institution, consolidating a unified Mizo-Christian identity.

Nonetheless, it is important to note that despite the decline of oral traditions and the marginalization of indigenous practices, this transformation is better seen as a cultural negotiation than as a loss. Margaret [Pachau \(2027\)](#) notes that modernity and the coming of print in the Mizo context did not mean the elimination of the oral. Rather, there was a new relation of power between the written or print and the oral. The meaning of modernity and the coming of print now lay in that new relation of power. The Mizo people have not simply assimilated foreign values but have rearticulated their identity through the fusion of tribal heritage, Christian faith, and modern textual practices. The Mizo people have used print not only to remember but also to reinvent themselves and their identity is thus continuously constituted and re-constituted, it is not fixed.

CONFLICT OF INTERESTS

None .

ACKNOWLEDGMENTS

None.

REFERENCES

- Gintsburg, S., & Ford, J. (2021). Introduction. *Rilce Revista de Filología Hispánica*, 36(4), 1239-1250. <https://doi.org/10.15581/008.36.41073>
- Lord, A. B. (1960). *The Singer of Tales* (2nd ed., S. Mitchell & G. Nagy, Eds.). Harvard University Press.
- Mizoram Presbyterian Church. (2024). Synod Official Website.
- Mizoram population 2025 | Sex ratio & literacy rate 2025. (n.d.). Census 2011 India.
- Pachau, J. L. K. (2014). *Being Mizo: Identity and Belonging in Northeast India*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199451159.001.0001>
- Pachau, M. L. (2017). Orality: Analysing its Politics Within the Domains of the Mizo Narrative. In L. Dzuvichu & M. Baruah (Eds.), *Modern practices in North East India: History, culture, representation* (pp. xx-xx). Routledge. <https://doi.org/10.4324/9781351271363-7>
- Purkayastha, S. (2019). Social Change in Lushai Hills. *Indian Journal of Public Administration*, 65(2), 525-532. <https://doi.org/10.1177/0019556119863861>
- Thirumal, P., & Lalrozami, C. (2010). On the Discursive and Material Context of the First Handwritten Lushai newspaper 'Mizo Chanchin Laishuih', 1898. *The Indian Economic and Social History Review*, 47(3), 377-403. <https://doi.org/10.1177/001946461004700304>
- Thirumal, P., Laldinpui, & Lalrozami, C. (2019). *Modern Mizoram: History, Culture, Poetics*. Routledge. <https://doi.org/10.4324/9780429447990>
- Zarzosanga. (2021). Conceptualising 'Other' in the Context of Mizo Identity. *CMU Journal of Social Sciences and Humanities*, 8(1), 1-11. <https://doi.org/10.12982/CMUJASR.2021.001>