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# Transnational TV Series Adaptations: What Artificial Intelligence Can Tell Us About Gender Inequality In France And The US

## ABSTRACT

The present research analyzes the inequality of gender representation in transnational TV series. For this purpose, a content analysis was carried out on 18 episodes of the US crime show *Law & Order: Criminal Intent* and its French adaptation *Paris Enquêtes Criminelles*. To conduct this research, we used the artificial intelligence toolkit the Möbius Trip, which is equipped with a gender and emotion recognition feature and relies on big data. The main findings indicate that male characters overwhelmingly dominate the onscreen time equally in both the US and the French versions. The data also show that male characters are more emotionally expressive and that women tend to display a wider range of emotions. The French characters are slightly more emotionally expressive than their American counterparts. The data also suggest that male characters tend to display violent behavior and that female characters tend to be portrayed as a victim in both versions of the show. The emotions-related results show a trend, but the difference of emotions between male and female characters and between the French and American cultures remain fairly narrow.

## KEY WORDS

Transnational TV series. Artificial intelligence. Big data. Gender inequality.

# 1. Introduction

In this paper, we present our provisional results on gender representation in transnational TV series adaptations in France and the US. Based on the American crime show *Law & Order: Criminal Intent* and its French adaptation *Paris Enquêtes Criminelles*, we explore the features of our artificial intelligence (AI) movie detection toolkit, the Möbius Trip. This study showcases collection, correlation, and analysis of data through the the Möbius Trip on gender and emotions. We compare the screen-time between male and female characters in both the French and the US versions of the TV series. We also compare emotion display between countries and gender in both cultures. This quantitative research relies on big data, as we are seeking to uncover patterns of gender representation.

This study is a work in progress, and our results are still preliminary. Our goal is to create an all-inclusive toolkit that is able to reverse-engineer the shows to measure, analyze, and compare their constituting elements. We seek to manage big data to uncover cultural trends in transnational TV series representation in order to study the broader culture in which the shows are embedded. Gender representation is thus one element of a more comprehensive approach. It is the first step towards changing the way we analyze transnational TV series.

## 2. Literature Review

### Transnational TV series

In the context of *glocalization*, which consists of adapting globalized content models or patterns to local cultures,<sup>1</sup> the recent trend of remaking the hit TV series first created in other countries has become a worldwide phenomenon. TV scholar Albert Moran argues that one of the goals of TV series adaptations lies in transferring the success of ratings from one country to another.<sup>2</sup> He notes that adapting a show lowers commercial failure risk because of its well-tried format. Transnational adaptations should capitalize on the popularity of the original show. TV series adaptations are relevant to this inquiry because they are established forms of cultural representation that mobilize billions of dollars every year in the global entertainment industry complex. Unfortunately, reality often contradicts Moran's statement, and numerous shows fail to connect with their audience.<sup>3</sup> Whether successful or not, transnational TV series adaptations reflect the need for cultural proximity, a multidimensional concept that assumes that an audience appreciates media products that are proximate to their own cultural backgrounds.<sup>4</sup> This proximity is defined by history, ethnicity, religion, language, and geography.<sup>5</sup> The change of elements includes language, as well as dress, ethnic types, gestures, body language, humor, music, religion, gender image, lifestyle, personal experiences, education, family, and organizational affiliation.<sup>6,7</sup>

<sup>1</sup> STRAUBHAAR, J. D.: (Re)Asserting National Television and National Identity Against the Global, Regional, and Local Levels of World Television. In DURHAM, M. G., KELLNER, D. M.: *Media and Cultural Studies: Keywords*. Malden : Blackwell Publishing, 2006, p. 681-702.

<sup>2</sup> MORAN, A.: *TV Formats Worldwide: Localizing Global Programs*. United Kingdom : Intellect Books, 2009, p. 82.

<sup>3</sup> CARTER, B.: *Why Studios Keep Cranking Out TV Remakes, Despite the Flops*. [online]. [2021-03-21]. Available at: <[www.nytimes.com/2009/12/28/business/media/28remakes.html](http://www.nytimes.com/2009/12/28/business/media/28remakes.html)>.

<sup>4</sup> STRAUBHAAR, J. D.: Beyond media imperialism: Asymmetrical interdependence and cultural proximity. In *Critical Studies in Mass Communication*, 1991, Vol. 8, No. 1, p. 261-78.

<sup>5</sup> LU, J., LIU, X., CHENG, Y.: Cultural Proximity and Genre Proximity: How Do Chinese Viewers Enjoy American and Korean TV Dramas? In *SAGE Open*, 2019, Vol. 9, No. 1, p. 2.

<sup>6</sup> KSIAZEK, T. B., WEBSTER, T. B.: Cultural Proximity and Audience Behavior: The Role of Language in Patterns of Polarization and Multicultural Fluency. In *Journal of Broadcasting & Electronic Media*, 2008, Vol. 52, No. 3, p. 485-503.

<sup>7</sup> LA PASATINA, A. C., STRAUBHAAR, J. D.: Multiple Proximities between Television Genres and Audiences: The Schism between Telenovelas' Global Distribution and Local Consumption. In *Gazette (Leiden, Netherlands)*, 2005, Vol. 67, No. 3, 2005, p. 271-288.

Indeed, TV series exhibit real-world features and traditions to reflect the culture it is embedded in. As Buonanno explains, „*stories narrated by television have important cultural significance, however unoriginal, banal and repetitive they may seem (and sometimes indeed are)*.“<sup>8</sup> In other words, TV series mirror contemporary behaviors, social practices, or world views of the societies in which they are embedded. Therefore, they are relevant to study cultures. Russian philosopher Mikael Bakhtin explains: „*In the realm of culture, outsidership is a most powerful factor in understanding. It is only in the eyes of another culture that foreign culture reveals itself fully and profoundly.*“<sup>9</sup> Bakhtin’s argument makes the study of transnational TV series an arena to study cultural representation differences in adaptations because they offer an ideal platform to study the complexities of cultural representation and production in the context of globalization.

To conduct our research, we use the popular American TV crime show: *Law & Order: Criminal Intent* and its French adaptation *Paris Enquêtes Criminelles*. The American version of *Law & Order: Criminal Intent* was very successful in the US. The show, created by Dick Wolfe, boasts 195 episodes in the course of ten seasons. The French version, *Paris Enquêtes Criminelles*, did not meet the expectations in terms of the audience in France. As a consequence, it was discontinued after only 20 episodes and lasted only three seasons. Whether successful or not, the French adaptation of the show offers an excellent showcase of how a transnational TV series is adapted. Michelle Hilmes explains that the adapted series was „*overseen by obsessive care by its creator.*“<sup>10</sup> Robertson added that the guideline for the French version is about 1000 pages long. With such a detailed outline, Barnes claims, „*absolutely nothing was left to interpretation.*“<sup>11</sup> The adaptors have to follow strict guidelines imposed by the original writer of the show. Because of the drastic constraints imposed by Wolfe, we can assume that any change of element necessarily reflects the French culture. *Paris Enquêtes Criminelles* director Frank Ollivier explains that the cultural adaptation of a show implies conscious and unconscious processes.<sup>12</sup> Some changes are done naturally. In other instances, Ollivier intentionally modified some elements of the adapted version to *Frenchify* the show. These elements range from the most superficial level to the most rooted features of the cultural fabric. The end product is an original French TV series, which abides by the French norms and conventions, and mirrors the French audience.

## How Technology Reveals Gender Inequality Onscreen

Traditionally, film analysis has been done by hand,<sup>13,14</sup> and several methodologies based on handmade annotation systems have been developed.<sup>15,16</sup> Computer scientist Lev Manovich states that nowadays, „*computerization turns media into computer data.*“<sup>17</sup> Manovich heralds that the emergence of digital tools transforms how media scholars study moving images. While still based on handmade annotation systems, these new technologies have largely contributed to new approaches, new methods, and unprecedented ways to gather and manage data. Scholars

<sup>8</sup> BUONANNO, M.: *The Age of Television: Experiences and Theories*. Chicago : University of Chicago Press, 2008, p. 72.

<sup>9</sup> BAKHTIN, M. M.: *Speech Genres and Other Late Essays*. Texas : University of Texas Press, 2014, p. 1.

<sup>10</sup> HILMES, M.: *Network nations: a transnational history of British and American broadcasting*. New York : Routledge, 2012, p. 305.

<sup>11</sup> ROBERTSON, R.: *European glocalization in global context*. Hampshire : Palgrave Macmillan, 2014, p. 89.

<sup>12</sup> DIGEON, L.: *Personal interview with French Director Franck Ollivier* on Skype, February 21th, 2019.

<sup>13</sup> HALL, E. T.: *The Hidden Dimension*. USA : Doubleday, 1969.

<sup>14</sup> BIRDWHISTELL, R. L.: *Kinesics and Context: Essays on Body Motion Communication*. Philadelphia : University of Pennsylvania Press, 1990.

<sup>15</sup> EKMAN, P., WALLACE, V. F.: *The Repertoire of Nonverbal Behavior: Categories, Origins, Usage, and Coding*. In *Semiotica*, 1969, Vol. 1, No. 1, p. 1-51. ISSN 1613-3692.

<sup>16</sup> HALL, E. T.: *A System for the Notation of Proxemic Behavior*. In *American Anthropologist*, 1963, Vol. 65, No. 5, p. 1003-1026.

<sup>17</sup> MANOVICH, L.: *The Language of New Media*. Cambridge : MIT Press, 2001, p. 45.

from different fields agree that Computer-Assisted Media Analysis is essential to study moving images. For instance, Larkey et al. have explored the use of various software such as Atlas.ti, the Multimodal Software Analysis, and Cinemetrics to compare transnational TV series.<sup>18</sup> They proposed an innovative approach based on reverse-engineering and measuring cinematographic and cultural elements. However, they were constrained by time consumption, a limited corpus of study, human error, and a lack of precision. The limited amount of data extracted was not enough to bring to light cultural trends.

The advent of artificial intelligence technologies offers new venues in the ways we collect and analyze data. Thanks to these technologies, we can now envision and develop new methodologies for film and TV series analysis. Relying on artificial intelligence software, the Geena Davis Institute on Gender in Media has paved the way to a groundbreaking approach to studying women in films. Its goal is to uncover unconscious biases on gender (and other parameters such as age and race) to raise awareness of the imbalance in terms of representation on screen. Its quantitative approach relies on content analysis. For instance, the software is able to measure the time women appear on the screen, as well as the time they speak and can be heard. With its first-ever international study on gender images in global films and its unprecedented data, the Geena Davis Institute startled Hollywood and the cinema industry worldwide. Geena Davis revealed, „*while women represent half of the world's population, less than one-third of all speaking characters in film are female. Less than a quarter of the fictional onscreen workforce is comprised of women (22,5%)*.”<sup>19</sup> Such data demonstrate the blatant inequality between genders in the cinema and TV series industry at the global level. It objectively proves that the film industry perpetuates discrimination against women by suppressing their presence on screen and by literally not being heard.

First, the Geena Davis Institute's findings are objective because they rely on quantitative data. Most importantly, they are groundbreaking because they draw on big data. As of today, the Geena Davis Institute has collected the largest body of research on gender prevalence in movies (family entertainment) over a span of 28 years.<sup>20</sup> Big data generate unmatched volume, speed, and variety of primary data, which reveals trends that would otherwise be invisible. It gives the big picture of women's representation. It provides strong evidence to the film and television industry with great accuracy. Such an approach would be unconceivable without AI and the ability to manage big data.

While women are underrepresented in cinema and TV series at a worldwide level, it seems that the trend varies from country to country. In France, the Conseil Supérieur de l'Audiovisuel (CSA), which is the equivalent of the Federal Communications Commission (FCC) in the US, also uses big data to uncover televisual trends. In a comparative study on gender representation between French and American TV series, the CSA analyzed 26 audiovisual French and American TV shows. According to the report, French TV series showcase 52% male characters and 48% female (Figure 1). In comparison, American TV series exhibit 62% male characters and 38% female characters.<sup>21</sup> The domination of the screen by male characters is significantly higher in the American TV series than in the French ones. This gap in representation also reflects the reality of both the US and French societies. The Gender Gap report integrates the latest statistics from international organizations and a survey of executives. The Global Gender Gap

<sup>18</sup> LARKEY, E., DIGEON, L., ER, I.: Measuring Transnationalism. In *TV Formats and Format Research*, 2016, Vol. 5, No. 9, p. 72-92.

<sup>19</sup> *Press Release: Global Film Industry Perpetuates Discrimination against Women*. [online]. [2021-03-20]. Available at: <[www.unwomen.org/en/news/stories/2014/9/geena-davis-study-press-release](http://www.unwomen.org/en/news/stories/2014/9/geena-davis-study-press-release)>.

<sup>20</sup> *Research Informs & Empowers*. [online]. [2021-03-21]. Available at: <[seejane.org/research-informs-empowers/?itm\\_term=home](http://seejane.org/research-informs-empowers/?itm_term=home)>.

<sup>21</sup> *La Place Des Femmes Dans Les Oeuvres Audiovisuelles (Fictions TV)*. [online]. [2021-03-19]. Available at: <[www.csa.fr/Informer/Collections-du-CSA/Thema-Toutes-les-etudes-realisees-ou-co-realisees-par-le-CSA-sur-des-themes-specifiques/Les-etudes-du-CSA/La-place-des-femmes-dans-les-oeuvres-audiovisuelles-fictions-TV-2013](http://www.csa.fr/Informer/Collections-du-CSA/Thema-Toutes-les-etudes-realisees-ou-co-realisees-par-le-CSA-sur-des-themes-specifiques/Les-etudes-du-CSA/La-place-des-femmes-dans-les-oeuvres-audiovisuelles-fictions-TV-2013)>.

Index 2020 places France in the 7<sup>th</sup> rank, and the US holds the 53<sup>rd</sup> position.<sup>22</sup> The real-world data converges with the representation onscreen. Because TV shows reflect the society in which they are embedded,<sup>23</sup> analyzing TV series with AI software capable of managing big data highlights cultural elements of that society.

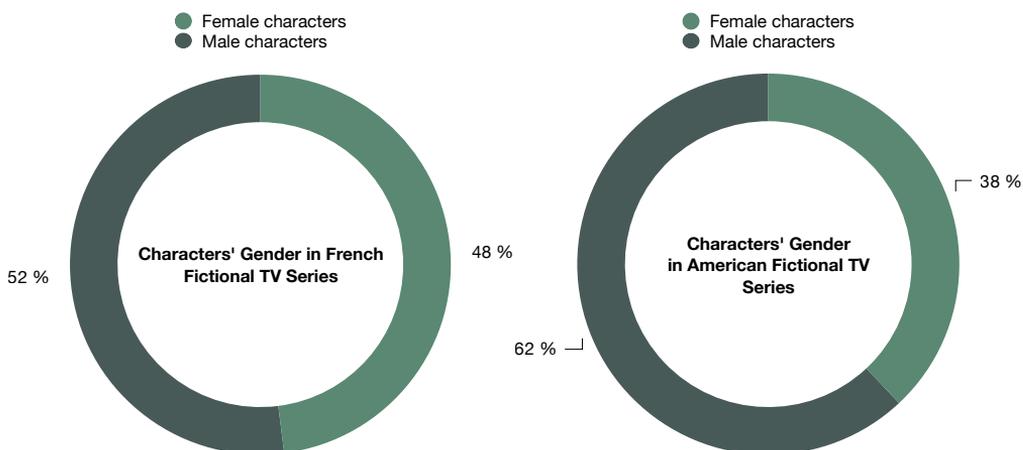


FIGURE 1: Comparisons of gender in French Series and American series in 2013

Source: own processing, 2021

### The Influence of Gender and Culture on Emotions

In addition to focusing on gender and screen-time, our current research looks at characters' displays of emotion. Characters' emotions display is an essential component because it informs us further on relation dynamics (e.g., power relationship) and gender representation. In this paper, we use the term *emotion* to relate the characters' facial expressions. Elspeth Probyn states, „A basic distinction is that emotion refers to cultural and social expression, whereas effects are of a biological and physiological nature.“<sup>24</sup> Emotions provide cues on characters' personality, social, cultural, and situational contexts they are in. They are essential to understanding relationship dynamics in a cultural context. Leslie Brody and Judith Hall warn us, „Since males and females are often socialized to have different motives and goals—depending on their ages, cultural backgrounds, and socialization histories—gender differences should occur in emotional processes, but should also fail to generalize broadly, instead of varying as a function of these same factors.“<sup>25</sup> Because there are multiple variables, analyzing emotions can indeed be a real challenge.

There is a common assumption regarding women being more emotionally expressive than men.<sup>26</sup> As Probyn argues in her work on affect and emotions, „Women have been associated with the emotions is so prevalent a notion in our culture that it can go unqualified.“<sup>27</sup> This claim has been supported by the results of many academic research papers indicating that

<sup>22</sup> Global Gender Gap Report 2020. [online]. [2021-03-21]. Available at: <[http://www3.weforum.org/docs/WEF\\_GGGR\\_2020.pdf](http://www3.weforum.org/docs/WEF_GGGR_2020.pdf)>.

<sup>23</sup> BATAILLE, S., HATCHUEL, S.: *Préface. Les Séries Télévisées Dans Le Monde : Échanges, Déplacements Et Transpositions*. [online]. [2021-03-21]. Available at: <<https://journals.openedition.org/tvseries/1351>>.

<sup>24</sup> PROBYN, E.: *Blush: Faces of Shame*. Minnesota : University of Minnesota Press, 2005, p. 11.

<sup>25</sup> BRODY, L. R., HALL, J. A.: Gender and Emotion in Context. In LEWIS, M., HAVILAND-JONES, J. M. (eds.): *Handbook of Emotions*, New York : Guilford Press, 2010, p. 395.

<sup>26</sup> PARKINS, R.: *Gender and Emotional Expressiveness: An Analysis of Prosodic Features in Emotional Expression*. [online]. [2021-03-21]. Available at: <[https://www.griffith.edu.au/\\_\\_data/assets/pdf\\_file/0026/363680/Paper-6-Parkins-Gender-and-Emotional-Expressiveness\\_final.pdf](https://www.griffith.edu.au/__data/assets/pdf_file/0026/363680/Paper-6-Parkins-Gender-and-Emotional-Expressiveness_final.pdf)>.

<sup>27</sup> PROBYN, E.: *Blush: Faces of Shame*. Minnesota : University of Minnesota Press, 2005, p. 81.

women are indeed the more emotionally expressive of the genders.<sup>28,29,30</sup> It has also been found that the emotions of happiness, sadness, and fear are believed to be more characteristic of women, whereas men are believed to be more characteristically angry. This idea is backed up by a recent study from the Geena Davis Institute that claims, „*Male characters are more likely to be shown as violent (16,2% compared with 12,8%) and twice as likely to be depicted as criminal (6,0% compared with 3,2%) than female characters.*“<sup>31</sup> These stereotypes have provided a basis for society to deem what is and is not socially acceptable for males and females in displaying emotions.<sup>32</sup>

While emotion is highly contingent on gender, it is equally the case across cultures. Rooted in the field of intercultural communication, Edward T. Hall discusses the way context is used differently to communicate. He defines two categories: high context and low context cultures. Toomey and Chung explain: „*In low-context communication, the emphasis is on how intention or meaning is expressed through explicit messages. In high context cultures, the emphasis is on how intention or meaning can be best conveyed through the embedded contexts (e.g., social roles or positions, relationship types, intergroup history) and the nonverbal channels (e.g., pauses, silence, tone of the voice) of the verbal message.*“<sup>33</sup> High context means that „*most of the information is either in the physical context or initialized in the person, while very little is in the coded, explicit, transmitted part of the message.*“<sup>34</sup> In contrast, low-context communication occurs when „*the mass of information is vested in the explicit code.*“<sup>35</sup> Based on the framework proposed by Hall, we can analyze and predict cultural differences in communication styles between France and the US. France is perceived as a high-context culture, which means that French people focus more on personal relations; they tend to communicate more intensively with their in-groups keeping them up-to-date while preferring face-to-face communication. The French emphasize formalized and stylized interaction rituals, which are a type of nonverbal behavior.<sup>36</sup> In high-context cultures, facial expressions and gestures take on greater importance in conveying and understanding a message. In contrast, Americans tend not to make such a strong distinction when interacting with their in-groups and out-groups. Hence „*the verbal content of communication in low-context cultures carry very specific, literal information.*“<sup>37</sup> Americans tend to communicate information indirect, explicit, and precise ways. They do not use facial expressions and body language as much as the French. Besides, emotional expressions are likely to vary depending on the individualistic/collectivistic nature of the culture. Both France and the US are considered to be individualistic cultures, but their degree of individualism vary. Social psychologist Geert Hofstede proposed a dimensions model of national culture in which he evaluates nations' characteristics. According to his scale, the US is considered more individualistic than France. France is considered to be an individualistic country with a score

<sup>28</sup> ASHMORE, R. D., DEL BOCA, F. K.: Sex Stereotypes and Implicit Personality Theory: Toward a Cognitive-Social Psychological Conceptualization. In *Sex Roles*, 1979, Vol. 5, No. 2, p. 219-248.

<sup>29</sup> BRODY, L. R., HALL, J. A.: Gender and Emotion in Context. In LEWIS, M., HAVILAND-JONES, J. M. (eds.): *Handbook of Emotions*. New York : Guilford Press, 2010, p. 395-408.

<sup>30</sup> JOHNSON, J. T., SHULMAN, G. A.: More Alike than Meets the Eye: Perceived Gender Differences in Subjective Experience and Its Display. In *Sex Roles*, 1998, Vol. 19, No. 1-2, p. 67-79.

<sup>31</sup> *Research Informs & Empowers*. [online]. [2021-03-12]. Available at: <seejane.org/research-informs-empowers/?itm\_term=home>.

<sup>32</sup> PARKINS, R.: *Gender and Emotional Expressiveness: An Analysis of Prosodic Features in Emotional Expression*. [online]. [2021-03-21]. Available at: <https://www.griffith.edu.au/\_\_data/assets/pdf\_file/0026/363680/Paper-6-Parkins-Gender-and-Emotional-Expressiveness\_final.pdf>.

<sup>33</sup> TING-TOOMEY, S., CHUNG, L. C.: *Understanding Intercultural Communication*. Oxford : Oxford University Press, 2012, p. 123.

<sup>34</sup> HALL, E. T.: *Beyond Culture*. New York : Anchor Books, 1976, p. 79.

<sup>35</sup> *Ibid*, p. 70.

<sup>36</sup> NOVINGER, T.: *Intercultural communication: a practical guide*. Austin : University of Texas Press, 2001, p. 58.

<sup>37</sup> *Ibid*, p. 58.

of 71 out of 100. The US scores extremely high, with a score of 91 out of 100.<sup>38</sup> According to this reasoning, Americans are less likely to be more emotionally expressive.

Emotion display is therefore determined by both gender and culture. Based on an intercultural approach on emotions, Brody and Judith Hall explain: „Across 37 countries, women report more intense emotions that last longer and are expressed more overtly than do men (Fischer & Manstead, 2000). In other cross-cultural studies, females express more nonverbal emotional reactions – including facial reactions, vocal reactions, body movements, laughing, and smiling – when expressing joy, sadness, fear, and anger than males do (Scherer et al. 1986).“<sup>39</sup>

Multicultural trends corroborate that women are more expressive than men. Fischer and Manstead postulate that the male members in individualistic cultures tend to minimize emotional expressions.<sup>40</sup> They believe the expressing of emotions might threaten the control that is critical to their status.<sup>41</sup> As might be expected, these behavioral traits are conveyed on screen. For instance, French TV series give room for a greater variety of emotions display for female characters. The CSA reports that the portrayal of their emotions is inflated due to the essence of French TV series that often links the plot to the traditional place of intimacy and private life that features home moments.<sup>42</sup> These moments associated with family and friends typically emphasize the emotion of female characters. In sum, the study of transnational TV series is an ideal platform to study characters' emotions within a cultural context. Through our analysis of *Law & Order: Criminal Intent* and *Paris Enquêtes Criminelles*, we will confirm or challenge the data on gender and emotions, as well as the cultural theories we are using for our analysis.

### 3. Hypotheses

Based on the contributions and gaps in the theoretical corpus reviewed above, five hypotheses related to the narrative level of *Law & Order: Criminal Intent* and its French adaptation *Paris Enquêtes Criminelles* were proposed:

H1: There will be an underrepresentation of female characters compared to male characters in both *Law & Order* and *Paris Enquêtes Criminelles*.

H2: There will be a higher representation of women in *Paris Enquêtes Criminelles* than in *Law & Order: Criminal Intent*.

H3: Female characters will be more emotionally expressive and show a wider range of emotions than male characters in both versions.

H4: French characters will be more emotionally expressive and show a wider range of emotions than American characters.

H5: Male characters will display more violent behavior than female characters, who are more likely to be portrayed as victims.

<sup>38</sup> *Compare Countries*. [online]. [2021-03-12]. Available at: <[www.hofstede-insights.com/product/compare-countries/](http://www.hofstede-insights.com/product/compare-countries/)>.

<sup>39</sup> BRODY, L. R., HALL, J. A.: Gender and Emotion in Context. In LEWIS, M., HAVILAND-JONES, J. M. (eds.): *Handbook of Emotions*. New York : Guilford Press, 2010, p. 401.

<sup>40</sup> FISCHER, T., MANSTEAD, A. S. R.: The Relation between Gender and Emotion in Different Cultures. In *Gender and Emotion: Social Psychological Perspectives*. Cambridge : Cambridge University Press, 2000, p. 71-98.

<sup>41</sup> BRODY, L. R., HALL, J. A.: Gender and Emotion in Context. In LEWIS, M., HAVILAND-JONES, J. M. (eds.): *Handbook of Emotions*. New York : Guilford Press, 2010, p. 395-408.

<sup>42</sup> *La Place Des Femmes Dans Les Oeuvres Audiovisuelles (Fictions TV)*. [online]. [2021-03-19]. Available at: <[www.csa.fr/Informer/Collections-du-CSA/Thema-Toutes-les-etudes-realisees-ou-co-realisees-par-le-CSA-sur-des-themes-specifiques/Les-etudes-du-CSA/La-place-des-femmes-dans-les-oeuvres-audiovisuelles-fictions-TV-2013](http://www.csa.fr/Informer/Collections-du-CSA/Thema-Toutes-les-etudes-realisees-ou-co-realisees-par-le-CSA-sur-des-themes-specifiques/Les-etudes-du-CSA/La-place-des-femmes-dans-les-oeuvres-audiovisuelles-fictions-TV-2013)>.

## 4. Methodology

### Our Toolkit: The Möbius Trip

In this paper, we present the AI state-of-the-art software we nicknamed the Möbius Trip, born out of a collaboration between humanities scholar Landry Digeon, Ph.D., and artificial intelligence software engineer Anjal Amin. The Möbius Trip is a deep learning software. According to Hans-Dieter Wehle, „*Machine learning refers to any type of computer program that can „learn“ by itself without having to be explicitly programmed by a human.*“<sup>43</sup> Hence software that runs on deep learning does not need supervision, for it can figure out the learning process by itself. In addition, it does not need human intervention to analyze systematically and automatically our sample of TV series episodes. Because of time consumption and human error, this present study would not be possible by hand. The Möbius Trip is fast and becoming more accurate during data analysis of large amounts of data.

Our research relies on empirical content analysis as we aim to quantify and measure cultural elements. The Möbius Trip enables us to efficiently reverse-engineer the episodes of *Law & Order: Criminal Intent* and *Paris Enquêtes Criminelles*. It automatically identifies and extracts the elements constituting the episodes (i.e., gender and emotions). It calculates the number of male and female characters in each frame. One frame might feature multiple characters, including leads as well as supporting roles and background actors. Each of these characters is automatically assigned with an emotion. Next, the Möbius Trip's output allows us to compile and compare the elements with the equivalent elements of the other version of the show instantly. The Möbius Trip generates graphs showing trends and patterns in terms of gender and emotion in transnational TV series.

### Sampling

In order to conduct this research, we are using a convenience sample due to the rare availability of the data. In fact, *Law & Order: Criminal Intent* was the only American TV series that has been imported and adapted for a French audience until recently.<sup>44</sup> *Paris Enquêtes Criminelles* lasted only three seasons and 20 episodes, which is entirely sufficient. The corpus for comparison for this study consists of ten episodes of *Paris Enquêtes Criminelles* and the ten corresponding episodes of *Law & Order: Criminal Intent*. As Mangelo, Franzini, and Jordan observe, „*Although researchers generally use a sampling procedure to identify programs for analysis, there is currently no gold standard for the number of episodes needed to establish a valid, representative sample.*“<sup>45</sup> However, Manganello et al. still recommend at least a sample of seven episodes.<sup>46</sup>

We chose the episodes randomly because *Law & Order: Criminal Intent* is an anthological series, each episode is self-contained, and there is no overarching narrative strategy. Hence the shuffling of the shows has no impact on the data collected. We used the following episodes of *Law & Order: Criminal Intent* and their equivalents in *Paris Enquêtes Criminelles* (Table 1).

<sup>43</sup> WEHLE, H. D.: *Machine Learning, Deep Learning, and AI: What's the Difference*. [online]. [2021-03-12]. Available at: <[https://www.researchgate.net/publication/318900216\\_Machine\\_Learning\\_Deep\\_Learning\\_and\\_AI\\_What's\\_the\\_Difference](https://www.researchgate.net/publication/318900216_Machine_Learning_Deep_Learning_and_AI_What's_the_Difference)>.

<sup>44</sup> FOURNIER, A.: « *En Thérapie* », « *Euphoria* », « *Your Honor* », « *Je Te Promets* » : *remakes en série(s)*. [online]. [2021-03-12]. Available at: <[www.lemonde.fr/televvisions-radio/article/2021/01/25/en-therapie-euphoria-your-honor-je-te-promets-remakes-en-serie-s\\_6067580\\_1655027.html](http://www.lemonde.fr/televvisions-radio/article/2021/01/25/en-therapie-euphoria-your-honor-je-te-promets-remakes-en-serie-s_6067580_1655027.html)>.

<sup>45</sup> MANGANELLO, J. A., FRANZINI, A., JORDAN, A.: Sampling Television Programs for Content Analysis of Sex on TV: How Many Episodes Are Enough? In *Journal of Sex Research*, 2008, Vol. 45, No. 1, p. 9.

<sup>46</sup> Ibid, p. 9.

Law & Order episodes	Paris Enquêtes Criminelles episodes
1. S01E16 One	1. S01E01 Fantôme
2. S01E04 The Faithful	2. S01E02 Requiem Pour un Assassin
4. S01E03 Smothered	4. S01E04 Addiction
5. S01E09 The Good Doctor	5. S01E5 Scalpel
6. S01E07 Poison	6. S01E6 Ange de la Mort
7. S01E06 The Extra Man	7. S01E7 Un Homme de Trop
8. S01E11 The Third Horseman	8. S01E8 Le Justicier de l’Ombre
9. S02E11 Baggage	9. S03E06 Trafics
10. S02E13 See Me	10. S02E06 Visions

TABLE 1: List of Episodes sample: Law & Order: Criminal Intent and Paris Enquêtes Criminelles

Source: own processing, 2021

### Emotions

Relying on its facial recognition feature, the Möbius Trip is able to identify these universal expressions and deduces the characters’ emotions. Just like humans, who have the innate ability to recognize and distinguish between faces, the Möbius Trip has the same ability with more accuracy, great speed, and without any biases or human errors. It calculates every character visible in a frame and informs on both their gender and emotion. Because our research is transcultural, we rely on the „universal language of emotion“. Studying literate and preliterate cultures, Ekman and Izard proved the existence of six universal expressions: anger, disgust, fear, happiness, sadness, and surprise.<sup>47,48</sup> We added the neutral expression, which describes the resting face (Figure 2). In our research, we make the distinction between being *emotionally expressive* and *displaying a wider range of emotions*. The former refers to the display of one emotion. The latter refers to the scope of the eight emotions being performed by a character.

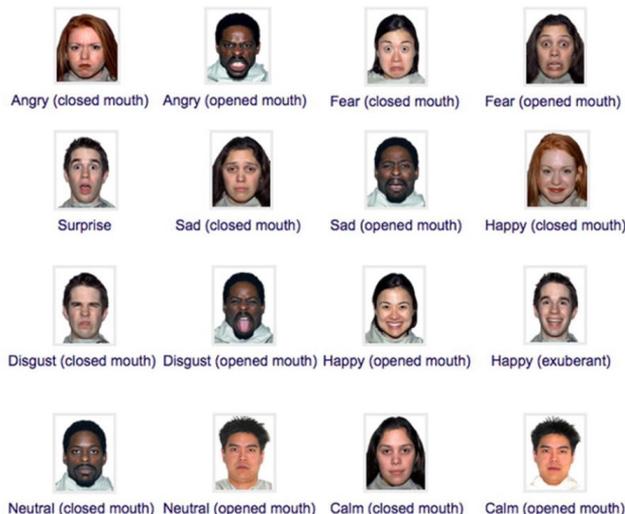


FIGURE 2: Example of Facial expression by actors

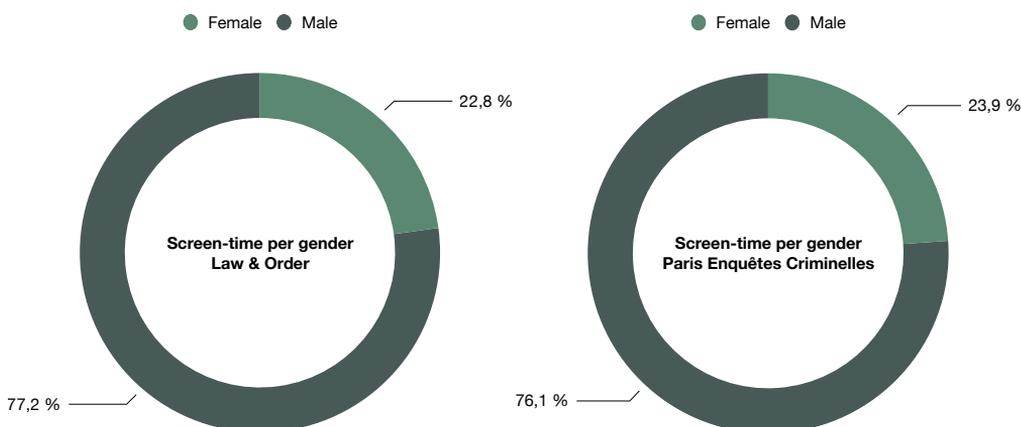
Source: TOTTENHAM, N., TANAKA, J. W., LEON, A. C. (eds.): The NimStim Set of Facial Expressions: Judgments from Untrained Research Participants. In *Psychiatry Research*, 2009, Vol. 168, No. 3, p. 242-249.

<sup>47</sup> EKMAN, P.: Universals and Cultural Differences in Facial Expressions of Emotion. In *Nebraska Symposium on Motivation*. San Francisco : University of Nebraska Press, 1971, p. 207-282.

<sup>48</sup> EKMAN, P., FRIESEN, W. V.: Constants across Cultures in the Face and Emotion. In *Journal of Personality and Social Psychology*, 1971, Vol. 17, No. 2, p. 124-129.

## 5. Results and Discussion

**H1: There will be an underrepresentation of female characters compared to male characters in both *Law & Order* and *Paris Enquêtes Criminelles*.**



**FIGURE 3:** Screen-time per gender in *Law & Order* and *Paris Enquêtes Criminelles*

Source: own processing, 2021

The data show that both series exhibit overwhelming domination of male characters in terms of screen time (Figure 3). In *Law & Order: Criminal Intent*, male characters make up for 77,2% of the gender displayed onscreen, while female characters only represent 22,8%. In *Paris Enquêtes Criminelles*, male characters make up for 76,1% of the gender displayed onscreen while female characters only represent 23,9%.

The overwhelming domination of men confirms Geena Davis' statement that for every female character, there are three male characters onscreen.<sup>49</sup> Our findings could be explained by the fact that both *Law & Order: Criminal Intent* and *Paris Enquêtes Criminelles* rely on a male leading actor and that the female protagonist is merely a supporting role. Besides, our data indicate that there are 44,150 frames containing at least one character in *Law & Order*. In contrast, the French version only contains 20,972 frames showing a character. This difference means that there are 2,1 times more characters displayed in *Law & Order: Criminal Intent* than in *Paris Enquêtes Criminelles*. We have calculated the average of cast members, which is available on IMDB.com. The average for *Law & Order* is 34,5 actors per episode, while it is 23 actors per episode for *Paris Enquêtes Criminelles*. We can speculate that such a difference in the cast could be due to the number of supporting actors that act in the police station or in the streets in *Law & Order*. These supporting actors are mostly males. This finding is consistent with Geena Davis' claim that 17% of the characters in crowded scenes are males.<sup>50</sup>

The screen time differential between men and women is certainly the most striking information provided by the Möbius Trip. As we expected, there is high inequality of representation between men and women, and men take the lion's share in terms of screen time. The findings confirm the overwhelming domination of men over women on screen that the Geena Davis Institute's data had heralded. Therefore, hypothesis 1 is confirmed since male characters significantly outnumber female characters in both versions of the series. Television series is overwhelmingly a man's world.

<sup>49</sup> Learn All about the Geena Davis Institute on Gender in Media. [online]. [2021-03-12]. Available at: <[www.youtube.com/watch?time\\_continue=173&v=mcgcJlJpysA&feature=emb\\_title](http://www.youtube.com/watch?time_continue=173&v=mcgcJlJpysA&feature=emb_title)>.

<sup>50</sup> Ibid.

## H2: There will be a higher representation of women in *Paris Enquêtes Criminelles* than in *Law & Order: Criminal Intent*.

Both *Law & Order: Criminal Intent* and *Paris Enquêtes Criminelles* exhibit an overrepresentation of men and subsequently an underrepresentation of women. In the American version, female characters represent 22,8% of the time; in the French version, they amount to 23,9% of the time (Table 4). They display perceptibly the same amount of screen time. The French female characters are slightly more visible (+ 1,1%). This narrow gap is unexpected. Based on the trend revealed by the CSA, the average gap between men and women in US fictional TV series consists of 62% male characters and 38% female characters (Table 1). Our results show that *Law & Order* scores significantly higher than the CSA average in terms of male screen time. The CSA also corroborated that the average gap between men and women in French fictional TV series was 52% male and 48% female (Table1). Therefore, we had anticipated that the gap between male and female characters in *Paris Enquêtes Criminelles* was going to be narrower than in the American version. This is not the case.

Our misled prediction was reinforced by the preliminary results we presented at the IEEM 2020.<sup>51</sup> Our early research suggested that there was a higher female character screen time representation in *Paris Enquêtes Criminelles*. When comparing a couple of episodes, our results show a slight underrepresentation of female characters. These results mirrored those presented in the CSA report. However, after improving the accuracy of the gender detection feature on the Möbius Trip and working on a bigger sample, we found that our results have changed, and the gap between male/female characters in the French version had significantly widened.

We had also believed there was going to be a higher representation of females in *Paris Enquêtes Criminelles* since French Director and show adaptor Franck Ollivier indicated that he intentionally tried to include more women in the show. He had sensed that the original *Law & Order* was „too masculine“<sup>52</sup> and wanted to make the French version „more feminine“<sup>53</sup> in order to appeal to a broader audience. While Ollivier consciously intended to add more women to the cast, he also admits that he might have been influenced by the original show, which focuses essentially on the male protagonist. In *Law & Order*, as well as in *Paris Enquêtes Criminelles*, women are the supporting role. Eames is the partner of Goren, the real hero of the series, in the same way that Savigny is Revel's partner. These female characters remain behind the protagonist but whose presence goes beyond a simple figuration. The outcome is that both the French and the US versions display equally an overwhelming domination of the screen time by male characters. Therefore, Hypothesis 2 has not been verified by our results.

## H3: Female characters will be more emotionally expressive and show a wider range of emotions than male characters in both versions.

	Male characters (US + FR)		Female characters (US + FR)	
	Frames	Percentage	Frames	Percentage
Neutral	24245	48%	7610	50%
Sad	15318	31%	4583	30%
Angry	6351	13%	1391	9%
Happy	3242	6%	1172	8%
Fear	657	1%	234	2%
Disgust	24	0%	3	0%

<sup>51</sup> DIGEON, L., AMIN, A.: TV Series Adaptations: An AI Toolkit for Success. In *IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)*. [online]. [2021-03-12]. Available at: <[https://www.researchgate.net/publication/348917106\\_Transnational\\_TV\\_Series\\_Adaptations\\_An\\_AI\\_Tool\\_for\\_Success](https://www.researchgate.net/publication/348917106_Transnational_TV_Series_Adaptations_An_AI_Tool_for_Success)>.

<sup>52</sup> DIGEON, L.: *Personal interview with French Director Franck Ollivier* on Skype, February 21th, 2019.

<sup>53</sup> Ibid.

<b>Surprise</b>	173	0%	119	1%
<b>TOTAL</b>	50010	100%	15112	100%

TABLE 2: Characters' emotions per gender

Source: own processing, 2021

The display of characters' emotional expressivity and range of emotions between male and female characters (both cultures combined) follow a similar pattern (Table 2). Yet, the findings reveal that the female characters are portrayed as more neutral (+2%) than male characters. Subsequently, female characters show less sadness (-1%) less anger (-4%). Hence, they are slightly less emotionally expressive than their male counterparts. Nonetheless, female characters display a wider range of emotions than male characters. They are happier (+2%), more surprised (+1%), and more scared (+1%) than male characters. Meanwhile, male characters in both the US and French versions display more anger (+4%) and more sadness (+1%) than female characters. This fact might be related to screen time, and the importance of the role played. Because there are significantly more male characters than females on screen, males get more acting time and have more opportunities to be more emotionally expressive. Male characters should also be solicited to show a wider range of emotions in comparison to the supporting roles, but it is not the case. Despite their minor roles in the shows, female characters still overperform male characters in terms of range of emotions. Hence, the findings only partially validate hypothesis 3. On the one hand, they confirm that female characters display a slightly wider range of emotions than male characters. On the other hand, male characters appear to be slightly more emotionally expressive.

**H4: French characters will be more emotionally expressive and show a wider range of emotions than American characters.**

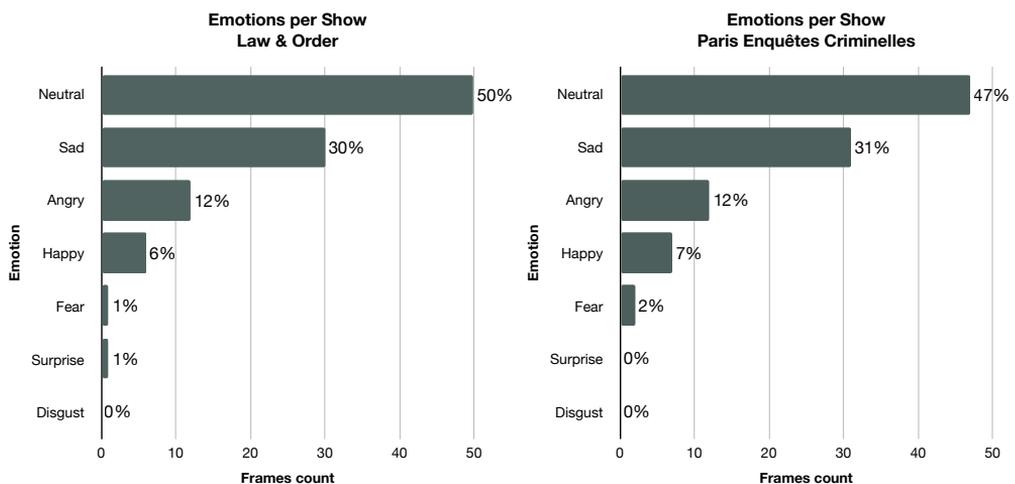


FIGURE 4: Emotions per shows

Source: own processing, 2021

The display of characters' emotional expressivity and range of emotions between the French and the Americans characters (both genders combined) follow a similar pattern (Figure 4). However, the findings reveal that the French are slightly more emotionally expressive than their American counterparts. The French characters are less neutral (-3%) than their American counterparts. They are sadder (+1%), happier (+1%), and more scared (+2%). Though the difference is subtle, the data confirms the idea that the French characters display more emotions.

This argument confirms the argument made by Fischer and Manstead that individualistic cultures, such as the US, exhibit less emotional expressions. Likewise, Hall's argument contends that high context cultures, like the French culture, are more likely to rely on facial expression when communicating. However, the American characters seem to have a slightly wider range of emotions since they display surprise (+1%), whereas the French do not. This result is unexpected and challenges the intercultural theories on context and individualism.

	Paris Enquêtes Criminelles		Law & Order	
	French Male Character	French Female Character	American Male Character	American Female Character
Neutral	46%	48%	49%	51%
Sad	32%	31%	30%	30%
Angry	13%	10%	12%	9%
Happy	7%	8%	6%	7%
Fear	2%	2%	1%	1%
Surprise	0%	1%	0%	1%
Disgust	0%	0%	0%	0%
<b>TOTAL</b>	100%	100%	100%	100%

**TABLE 3:** Emotions per shows per gender

Source: own processing, 2021

However, when broken down per gender, the analysis provides us with a more nuanced perspective which changes the proportions (Table 3). French male characters are portrayed as more emotionally expressive than their American counterpart. They are less neutral (-3%) and display more fear (+1%), more happiness (+1%), more anger (+1%), and more sadness (+1%). The French male characters also show more expressivity than the American female characters since they are less neutral (-5%) and display more sadness (+1%), more anger (+3%), more fear (+1%). Nonetheless, the American female characters display a wider range of emotions because they show surprise (+1%). In comparison, French female characters display more emotional expressivity than their American counterpart. French female characters are less neutral (-3%), and they show more anger (+1%), more fear (+1%), more happiness (+1%), and more sadness (+1%) than American female characters. French female characters and American ones share the same range of emotions. They display as many emotions as one another, but the French female character shows more emotional expressivity. These findings confirm the CSA's report suggesting that French women are portrayed as more emotional due to a higher amount of intimate scenes in the French version.

Out of all the characters combined, we would expect American male characters to be the least emotionally expressive. Novinger explains that a male exhibiting such an open emotional display loses face in a North American environment. According to studies based on content analysis carried out in the US, „*The North American male is culturally trained to be stoic and undemonstrative.*“ Novinger adds that in the United States, it is more acceptable for women to display more emotions. However, our findings show a more nuanced outcome. American women are the group that is least emotionally expressive since they are more neutral than American men (+2%), French men (+5%), and French women (+3%).

In sum, when comparing Americans and French at the gender level, the French are slightly more emotionally expressive and display more emotions than their American counterparts. Though the gap is extremely narrow, there is a trend that confirms hypothesis 3.

### **H5: Male characters will display a more violent behavior than female characters, who are more likely to be portrayed as victims.**

The data (Table 8) confirm that both in *Law & Order: Criminal Intent* and *Paris Enquêtes, Criminelles* male characters display more anger (+4%) than female characters (Table 6). Male characters are also sadder (+1%) than their female counterparts. In comparison, female characters are more scared (+1%), happier (+2%), more surprised (+1%) than male characters.

These findings are consistent with those of the Geena Davis Institute's research that presaged that men would display a higher degree of anger. Anger is associated with violent attitudes and behavior. In TV series, men are often depicted as angry and violent and play the role of the perpetrator of the crime. Conspicuously, male characters are mostly portrayed as sad (31%). This figure is odd since men typically show „expressions of anger“ and have been associated with lower experience and expression of anxiety and sadness. Such a high degree of sadness might signal that they are depicted as both aggressors as well as victims in both *Law & Order* and *Paris Enquêtes Criminelles*.

Crime victims typically experience a variety of emotions such as anger, sadness, anxiety, and fear). Female characters, though at a slightly lesser degree than male characters, also display a fairly high amount of sadness (30%) and anger (9%). Besides, they are also slightly more fearful (+1%) than male characters. Chaplin explains, „*fearful face conveys submissiveness*.“ The combination of these emotions suggests that female characters are portrayed as submissive and, therefore, as victims. Victimization was predicted as being mostly found in female representations. Though the difference in emotional expressivity is narrow, male characters are portrayed as violent and female characters as victims. We can consider that hypothesis 5 is validated.

## **6. Limitation**

Our study provides us with significant and unprecedented data. However, because our Möbius Trip is still at a developing stage, we lack features that could enable us to have a complete depiction of gender representation. For instance, the Möbius Trip does not yet measure the male and female characters' speaking time to have more accurate screen time data. It also needs to be equipped with character tracking. Such a feature would enable us to label the characters and have an indication of their age, social status, and race. It would add a qualitative component to our quantitative approach.

The behavioral characteristics of the characters are difficult to quantify because, on the one hand, their encoding is based on a subjective perception of the viewer and that, on the other hand, these characteristics may change and evolve during the series (CSA). Dezheng and O'Halloran explain, „*To fully understand the communication of emotion, we need to take into consideration all variables, such as the situational context and the multimodal expression of emotion*.“ We agree with O'Halloran. We believe that combining facial expressions, vocal and bodily cues, together with camera work, music, and mise-en-scene, could better predict emotions than the single modalities could and confirm the need for multimodal analysis than the single modalities on their own.

## **7. Conclusion**

In this paper, we have introduced our artificial intelligence software, the Möbius Trip, and we have presented our current results on gender representation in transnational TV series adaptations in France and in the US. According to the above results, both *Law & Order: Criminal Intent* and *Paris Enquêtes Criminelles* tend to show a negative characterization of females based on underrepresentation. Male characters overwhelmingly dominate the show. We also proved that

the lack of representation of female characters is fairly similar in both versions of the show. We demonstrated that emotion is contingent on gender and that female characters show a wider range of emotions, but that male characters are more emotionally expressive. We also demonstrated that the French characters are more emotionally expressive and show a wider range of emotions than their American counterparts. Lastly, we have shown that male characters tend to display violent behavior and that female characters tend to be portrayed as victims. The emotions-related results showed a trend, but the difference of emotions between male and female characters and between the French and American cultures were fairly narrow. We will continue investigating other French and American TV series in order to confirm the trend we have revealed in this study.

To conclude, the Möbius Trip can be a potent tool to raise awareness of women's discrimination in transnational TV series adaptation. In the future, we hope the Möbius Trip will help TV series directors check and balance their subjective opinions to make a more accurate decision based on real and objective data. We encourage TV series directors and broadcasters to define quantified progress objectives to improve the presence of women on their channels for more gender representation equity. In this way, our study could contribute to more awareness, social justice, and better cinematographic decisions.

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