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Beyond measure: using digital humanities to unravel the system of perspective within Japanese images in *nara-ehon* manuscripts of *otogi-zōshi* tales

Héléna D.M. Lagréou
The University of Cambridge

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ENG **Abstract:** The present article illustrates the advantages of digital humanities to unearth new understandings, in this case of the pre-modern Japanese visual culture. Precisely, this article serves three purposes. Firstly, it is a guide to digital methods for size analysis in visual studies. Secondly, this study proposes a survey of the collection of *nara-ehon* manuscripts of oblong format from the "Digital Collections of the Keio University Libraries". Thirdly, I present my study of perspective in Pre-Modern Japanese images, which have been puzzling scholars. Indeed, the size of characters depicted on the images varies greatly. Yet, these fluctuations in measurements are not used to illusorily transform a two-dimensional space into a three-dimensional one. The image composition and the varying sizes of characters do not create any spatial depth. Unfortunately, creating a systematic study of this visual conundrum was difficult prior to the rise of digital humanities, only leaving researchers to uncertainties. With these new creative methods, and the measurements of 1040 characters extracted from 244 images, the system of perspective within Japanese images is now clearer. Pre-Modern Japanese images use a psychological perspective intricately informed by a play on social norms restricted by the materiality of the manuscripts.
Keywords: Pre-Modern Japan; Japanese iconography; dimensional perspective; nara-ehon; otogi-zōshi; digital humanities.

ES Más allá de la medida: uso de las humanidades digitales para desentrañar el sistema de perspectiva dentro de las imágenes japonesas en los manuscritos *nara-ehon* de cuentos *otogi-zōshi*

ES **Resumen:** El presente artículo ilustra las ventajas de las humanidades digitales para desenterrar nuevas comprensiones, en este caso de la cultura visual japonesa premoderna. Precisamente, este artículo cumple tres propósitos. En primer lugar, es una guía de métodos digitales para el análisis de dimensiones en los estudios visuales. En segundo lugar, propone un estudio de la colección de manuscritos nara-ehon de formato oblongo de las "Colecciones Digitales de las Bibliotecas de la Universidad de Keio". En tercer lugar, presento mi estudio sobre la perspectiva en las imágenes japonesas premodernas, que ha venido desconcertando a los estudiosos. En efecto, el tamaño de los caracteres pintados en las imágenes varía enormemente. Sin embargo, estas fluctuaciones en las medidas no se utilizan para transformar ilusoriamente un espacio bidimensional en uno tridimensional. La composición de la imagen y los distintos tamaños de los personajes no crean profundidad espacial. Desgraciadamente, antes del auge de las humanidades digitales era difícil realizar un estudio sistemático de este enigma visual, por lo que a los investigadores sólo les quedaban hipótesis. Con estos nuevos métodos creativos, y las mediciones de 1040 caracteres extraídas de 244 imágenes, el sistema de perspectiva dentro de las imágenes japonesas está ahora más claro. Las imágenes japonesas premodernas utilizan una perspectiva psicológica intrincadamente informada por un juego de normas sociales restringido por la materialidad de los manuscritos.
Palabras clave: Japón premoderno; iconografía japonesa; perspectiva dimensional; nara-ehon; otogi-zōshi; humanidades digitales.

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1. Introduction

Prior to the Modern period, depth of space in Japanese images was not conveyed through a linear perspective. The flat surface of the page did not graphically render a realistic representation of space[1]. The environment appears almost blank lest for floating stylised clouds, or *suyarigasumi*, with characters dropped in the dream-like pictural space (Fig. 1)[2]. Although the spatial representation did not follow a linear perspective, it used one of its key visual features: size variation in objects. In linear perspective, artists mimic the human vision by representing objects that are further away from the viewer as smaller, and the ones closer as bigger. The variation in sizes of objects is one of the key tropes to render naturalistic space depth. The sizes of the characters vary in Japanese images as well, but do not allude to any visual spatial depth–quite the opposite, sometimes the smallest characters are in the foreground, with the biggest ones in the back, yet all were humans of the same size (Fig. 2). The meaning of this visual trope remains unknown due to methodological issues. This article aims to resolve this problem using digital humanities to survey the sizes the sizes of characters in these manuscripts to understand the perspective system used in these images.

Figure 1. *A wandering woman in Hashi hime*, Keio University Library, Tokyo, Japan, 110X@273@2@2, f. 13v-14 of the second booklet, Early Edo period. Source: © Keio University, Keio University Library, Nara Ehon and Emaki Collection. https://dcollections.lib.keio.ac.jp/en/naraehon/110x-273-2-2

The limitations of prior attempts to understand the perspective system were technical constraints[3].The pertinence of a digital humanities approach to visual material lies in two key factors. The characters of the images have a complex shape that cannot be easily measured, which made it impossible to offer accurate sizing of characters. The measurement software used for this study allowed to outline even complex shapes with great precision, correctly measuring the characters rather than relying on approximations of the naked eye. The manuscripts were as well varied in sizes, which subsequently affected the sizes of the characters. Therefore, it impeded any attempts of a systematic approach across a wider corpus, and observe general trends. To resolve this issue of standardisation of image, the measurements were scaled to enable a proportional comparison across manuscripts of different formats.

1 Marek H. Dominiczak, "Linear Perspective: A visual Revolution", *Clinical Chemistry* 61, no. 1 (2015): 311-312, https://doi.org/10.1373/clinchem.2014.226340.

2 This sense of a floating world is embodied by a cultural and artistic movement from the early Edo period of the Ukiyo, 浮世, or floating world. Deriving from Buddhist concepts, it presents a perspective and understanding of the world as illusory, thus floating, fleeting, and filled with passing emotions. This was coined as the characterising cultural identity of the Edo period, with the *Ukiyo-zōshi* for literature, and *Ukiyo-e* for visual arts. Tsuyoshi Hasegawa, *Ukiyo zōshi daijiten: Edo jidai no shakai, fūzoku ga wakaru* (Tokyo: Kasama Shoin, 2017). Sandy Kita, *The floating world of Ukiyo-e: shadows, dreams, and substance* (New York: Harry N. Abrams in association with the Library of Congress, 2001).

3 The key academic works done on this subject is shared between two authors, Tōru Takahashi and Midori Sano. Tōru Takahashi, *Monogatari to e no enkinhō* (Tokyo: Perikansha, 1991). Midori Sano, *Jikkuri mitai Genji monogatari emaki* (Tokyo: Shōgakukan, 2000).

Figure 2. *Music played by aristocrats in the house of Bunshō*, Keio University Library, Tokyo, Japan, 110X@445@3@3, f. 3 of the third booklet, late Muromachi period. Source: © Keio University, Keio University Library, Nara Ehon and Emaki Collection. https://dcollections.lib.keio.ac.jp/en/naraehon/110x-445-3-3

This study is an experimental and quantitative investigation of the surface area measurement of every character in a selection of *nara-ehon* manuscripts to understand the system of perspective in Japanese images. The sample emanates from the Digital Collections of the Keio University Libraries[4].

Two criteria narrowed the corpus: the manuscript had to be illuminated, and to be of an oblong format[5]. The corpus comprises of nineteen manuscripts, with 244 images resulting in the measurement of 1040 characters[6].

The corpus draws its coherence from both its format with codices of *nara-ehon*, and in content– with the *otogi-zōshi* tales. *Nara-ehon* were Pre-Modern Japanese illustrated codices[7]. This study includes only manuscripts of an oblong format, characterised by a rectangular binding of a large width and small height. This format was mainly used for popular tales of fiction, notably of *otogi-zōshi* tales[8]. The *otogi-zōshi* are one of the first cases of commercial fictional literature with a wider and more popular readership.[9] The coherence of the corpus was retroactively crafted during the nineteenth century[10]. An *otogi-zōshi* is a tale, most often produced during the Muromachi period (1336-1573), of a moderate literary complexity, with a comical tone which sometimes verges on vulgarity. The stories were often, unfairly, described as simplistic[11].

These negative perceptions of the genre slowly changed overtime. In 1955, Ichiko Teiji produced a new taxonomy for the *otogi-zōshi* corpus[12]. This classification renewed an interest in the *otogi-zōshi* amongst Western scholars, leading to the first study

4 Keio University Library, “Digital Collections of Keio University Library: the *Nara Ehon* and *Emaki* Collection”, Keio University Library, accessed 29 of June 2023, https://dcollections.lib.keio.ac.jp/en/naraehon.

5 The author outlines two formats of codex, oblong and vertical. Delphine Mulard, “Production et réception des manuscrits enluminés japonais des XVIIe et XVIIIe siècles : le cas du “ Récit de Bunshô ” (Bunshô sôshi)” (Ph.D. diss., Université Sorbonne Paris Cité, 2017), 94, https://theses.hal.science/tel-01649198.

6 The list of manuscripts used for this study is available is avaliable in this article in the "7.1. Sources" section, 117.

7 The taxonomy of these codices is most often based on chronological developments. They key studies on this topic are the following: Pierre Humbertclaude, “Nara ehon, les livre à miniatures japonais, 1570-1730”, in *Serie Orientale Roma VII*, ed. Giuseppe Tucci (Rome: Institut Italien pour le Moyen et Extrême Orient, 1955), 111-153. Tatsurō Akai, “Nara ehon ni tsuite”, *Kokka* 813, (1959): 451-461. William Watson, “Nara ehon”, in *Artistic Personality and Decorative Style in Japanese Art, Colloquies on Art and Archaeology in Asia n°6*, ed. William Watson (London: Percival David Foundation of Chinese Art, 1976), 121-164. Tatsurō Akai, “Nara ehon kenkyū”, in *Otogizōshi no Sekai, Nara ehon Kokusai kenkyū* (Tokyo: Sanseidō, 1982), 41-50. Tōru Ishikawa, *Nara ehon, emaki no seisei* (Tokyo: Miyai shoten, 2003), 304-312. Mulard, “Production et réception des manuscrits enluminés japonais des XVIIe et XVIIIe siècles”, 89-96.

8 See for reference research on the subject of the *otogi-zōshi* as a literary genre. *Otogizōshi no Sekai, Nara ehon Kokusai kenkyū kaigi* (Tokyo: Sanseidō, 1982). Nobuyoshi Furuhashi, Hideo Kuroda, and Satō Masahide, *Otogi-zōshi: monogatari, shisō, kaiga* (Tokyo: Perikansha, 1990). Hideo Kuroda, *Keishi to shite no otogi-zōshi* (Tokyo: Perikansha, 1996). Takashi Fuji (ed.), *Otogi-zōshi kenkyū sōsho*, vol. 1-5 (Tokyo: Kuresu Shuppan, 2003).

9 Daniel Struve and Jean-Jacques Tschudin, *La littérature japonaise* (Paris: Presses Universitaires de France, 2008), 34.

10 Seiichi Iwao *et al*., *Dictionnaire historique du Japon*, (Tokyo: Maison franco-japonaise, 1990), vol. 16, 144.

11 Iwao *et al*., *Dictionnaire historique du Japon*, 145.

12 Ichiko Teiji, *Chūsei shōsetsu no kenkyū* (Tokyo: Tokyo Daigaku Shupankai,1955), 26.

in English of an *otogi-zōshi* in 1963[13]. In the following years, academics focused on thematic approaches in literary studies[14]. However, the enthusiasm for the corpus decreased yet again, only to regrow around 2010. Struve and Tschudin summarised the importance of this genre by highlighting its commercial aspect.[15] The following work, , notably with Delphine Mulard and her remarkable thesis[16] embodies the new wave of interest in the genre[17].

The objectives of this study are to provide a more stable hypothesis on the system of perspective in Pre-modern Japanese images by using the technological advancements of the digital humanities. The resolution of the issue of visual perspective in Japanese images relies on a simple observation: perspective relies on sizing modifications of objects to render spatial depth. Thus, the measurement of these characters was cross-analysed with other metrics (e.g. social class, gender narrative role) would capture the visual system used in the images. To do so, this article introduces the digital methods used to obtain the measurement data, dives into its analysis, and finally explores the resulting hypothesis. The study ultimately concludes that the system of perspective within Pre-Modern Japanese images did not render a naturalistic space, but a narrative one. The narrative role of a character, its social class, and position in the image defined its size, , and the overall composition of the image.

2. Sizing methods in digital humanities

2.1. Data extraction

Data extraction was the first step of the study. I used *Digimizer*, an open-source software, to measure each character (Fig. 3)[18]. As there was no research precedent with this software for visual studies in humanities, a new research protocol was crafted[19]. Each image had to be digitalised to be transferred to the software, making the digital Collections of Keio University Libraries perfect for the purposes of this study[20]. Every image was then scaled following the measurements given by the Keio University. By this stage, characters were measured. As *Digimizer* is mostly used natural sciences, it provides a wide range of measurement data (Fig. 3). The most relevant measurement was the surface area for this study. Indeed, the perimeter depends on the outline of a character, the more intricate the outline was, the more the perimeter augmented–reflecting shape complexity, rather than space domination.

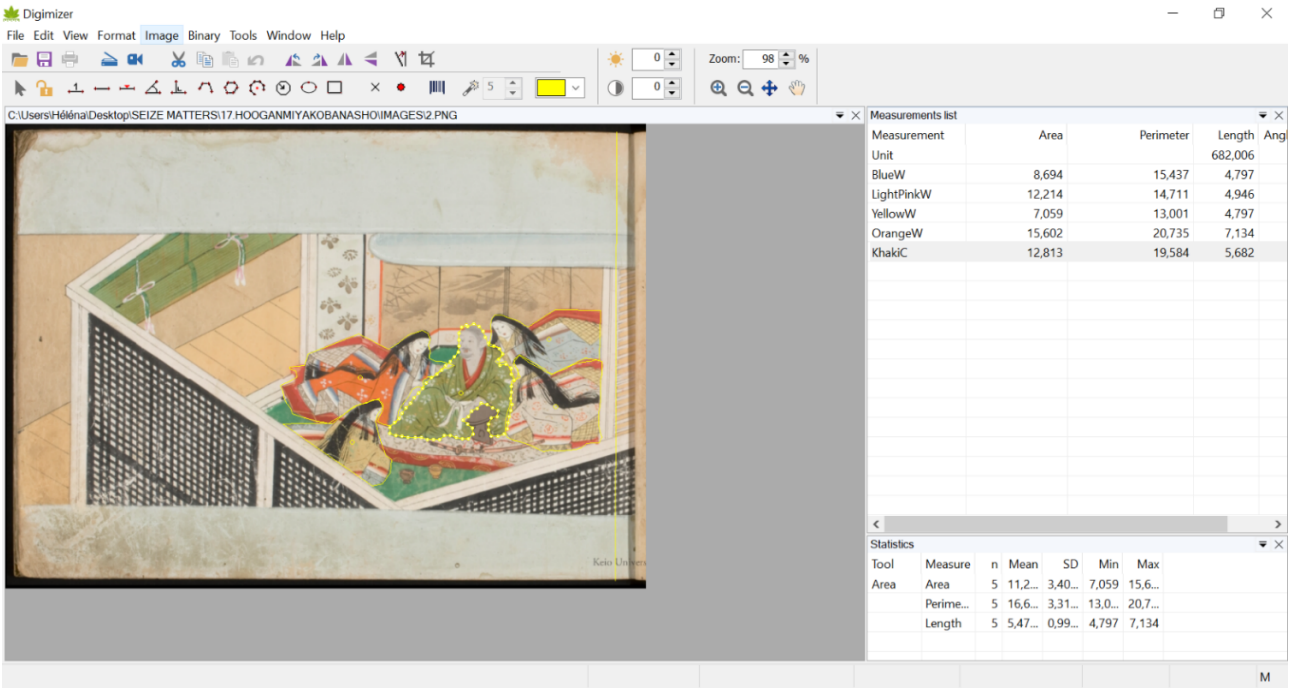

Figure 3. *Screenshot of the Digimizer software with the measurement list on the right*, *Hō gan Miyako-banashi*, Keio University Library, Tokyo, Japan, 110X@315@1, f. 6 of the first booklet, Early Edo period. Source: © Keio University, Keio University Library, Nara Ehon and Emaki Collection. https://dcollections.lib.keio.ac.jp/en/naraehon/110x-315-1

13 Edward D. Putzar, "The Tale of Money Genju: Sarugenji-zōshi", *Monumenta Nipponica* 18, no. 1 (1963): 288, https://doi.org/10.2307/2383142.

14 Virginia Skord, *Tales of Tears and Laughter: Short Fiction of Medieval Japan* (Honolulu: University of Hawai'i Press, 1991), https://doi.org/10.1515/9780824842178.

15 Struve and Tschudin, *La littérature japonaise*, 29-30.

16 Mulard, "Production et réception des manuscrits enluminés japonais des XVIIe et XVIIIe".

17 One of the most recent and comprehensive works on popular literature and its commercialisation in Japan is the following: Laura Moretti, *Pleasure in Profit: Popular Prose in Seventeenth-Century Japan* (New York: Columbia University Press, 2021), https://doi.org/10.7312/more19722.

18 MedCalc, "Digimizer", (Version 5.6.0), MedCalc, 2005, accessed 21 of June 2023, https://www.digimizer.com/.

19 Unfortunately, this software is mostly used in biology or chemistry. The only occurrence found of its use in humanities was an anthropological study on the craniometry of heads of Iranian male workers. Elham Salvarzi *et al.*, "Facial Anthropometric Measurements in Iranian Male Workers Using Digimizer Version 4.1.1.0 Image Analysis Software: A Pilot Study", *International Journal of Occupational Safety and Ergonomics* 24, no. 4 (2018): 570-576, https://doi.org/10.1080/10803548.2018.1433578.

20 Keio University Library, "Digital Collections of Keio University Library: the *Nara Ehon* and *Emaki* Collection", Keio University Library, accessed 29 of June 2023, https://dcollections.lib.keio.ac.jp/en/naraehon.

As the manuscripts had disparate dimensions, a uniform scale of study was created to compare the measurements of characters across codices. With a simple scaling function, the data was fictionally arranged, transforming all the values as if they were all extracted from a 500 cm2 page. The value of 500 cm2 was chosen as this does not denature the proportion visualisation of the data. The function is the following:

$$\text{Fictional value} = \text{original value X}\left(\frac{fictional\ image\ area}{original\ image\ area}\right)$$

Each value was computed with the latter formula, the real area value was multiplied by the quotient of the fictional page area value by the real page area value. This formula renders each value as if they were all on a 500cm2 page, allowing for a comparative approach.

2.2. Data organisation

The second step was to organise and store the data.[21] The data was stored within a database designed with the open-source software *LibreOfficeBase*[22]. The corpus was fractioned into a three-table database. These tables encapsulate gradually smaller scales of study. The first one represents the largest unit of the manuscripts, the second one the images, and the final table focuses on the characters (Fig. 4). Each table was linked with a "1 to N" relation, meaning each unit of the previous table links to an infinite number of units within the following.

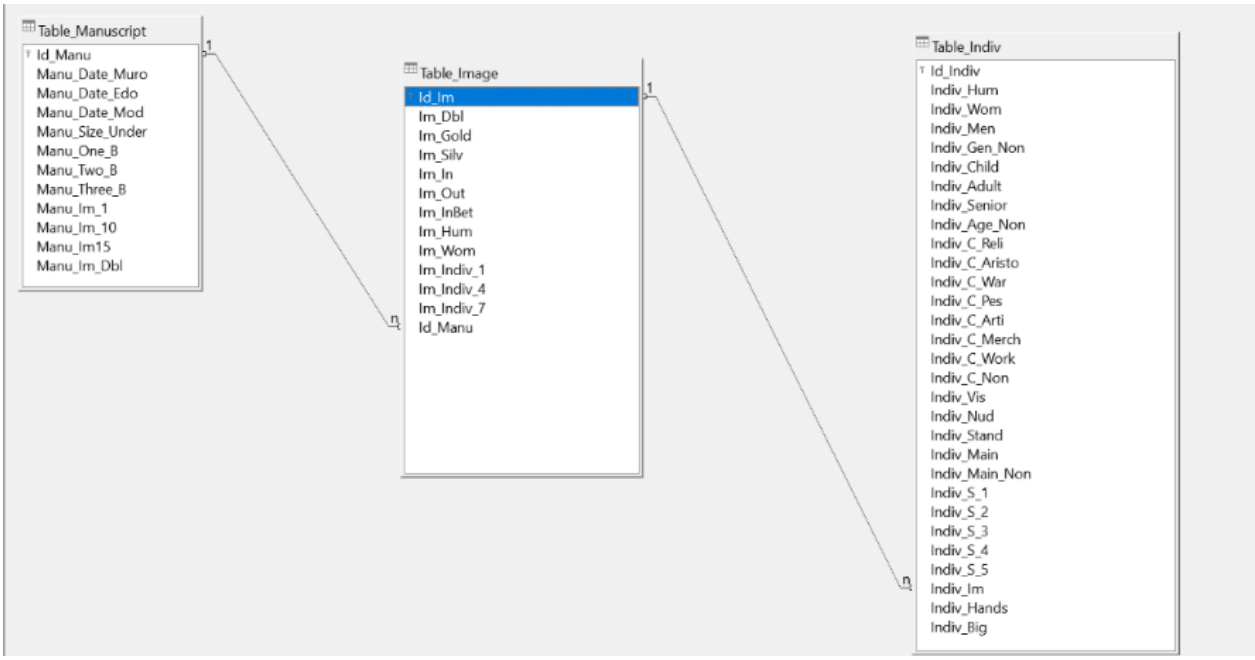

Figure 4. Screenshot of the database structure. Source: author.

The database is composed of three tables (Fig. 4)[23], with the first table exploring the materiality of manuscripts by testing their influence on the iconography. The second table addresses the composition of the image and functioned as a transition between the materiality of the manuscript and the iconography of the characters. For example, the table informs the number of individuals within a given image to test its influence on the size of characters. The final table deals with the qualitative iconographic metrics of the individuals within the images. For example, it recorded the gender, age, social class, size, and narrative position of a character. The gathered data was diverse in nature–some was numeral (measurements), other qualitative (gender, social class). Such variety in data format required a transformation of the original metrics to allow for comparaison, thus a binary system was set up. For example, I did not input the raw data for the surface area of the characters, but categories of sizes to compartmentalize the information.

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21 The most conceptually and technically sound research on digital humanities for historians remains amongst French scholars, especially the work of Alain Guerreau is one of the most comprehensive and accessible. Alain Guerreau, *Statistiques pour historiens*, electronic book, 2004, http://elec.enc.sorbonne.fr/statistiques/stat2004.pdf; Martine Cocaud (ed.), *Le traitement des données en Histoire et Sciences Sociales: Méthodes et outils* (Rennes: Presses Universitaires de Rennes, 2012).

22 The Document Foundation, "LibreOffice Base", (Version 6.3.0), The Document Foundation, 2019, accessed 21 of June 2023.

23 Database crafting for a corpus of images presents challenges. On these matters, the following references are useful: Danièle Thoe mas, "Histoire, image et informatique: le trinôme infernal", in *Histoire et informatique, Base de données, recherche documentaire multimedia*, ed. Martine Cocaud (Rennes: Presses Universitaire de Rennes, 1995), 201-227; Jérôme Baschet, "Pourquoi élaborer des bases de données d'images ?", in *History and Images. Toward a New Iconology*, ed. Alex Bolvig and Philip Lindley (Turnhout: Brepols, 2003), 59-66 and 83-106; Jérôme Baschet, "Corpus d'images et analyse sérielle", in *Les images dans l'Occident medieval*, ed. Jérôme Baschet and Pierre-Olivier Dittmar (Turnhout: Brepols, 2015), 319-332; Séverine Lepape, "Formalisation et analyse statistique d'un corpus d'images", in *Les images dans l'Occident medieval*, ed. Jérôme Baschet and Pierre-Olivier Dittmar (Turnhout: Brepols, 2015), 333-349.

2.3. Methods of analysis

The data was analysed via a statistical profile and chi-squared tests[24]. The profile outlined the main characteristics of the dataset, which guided the second step by hilighting the over or underrepresentation of certain metrics, informing the accuracy of the chi-squared calculations.

The chi-squared tests helped to understand what defined the sizes of characters. Precisely, chi-squared tests show the dependency between variables. Chi-squared tests rest on the principle of a double hypothesis. If the chi-squared number is higher than a set of thresholds, then the hypothesis "H0" is rejected, meaning the independence between the variables is rejected. Conversely, if the number is lower than the thresholds, the "H0" hypothesis is accepted, meaning there is an independence between the variables. To arrive to this conclusion, the data of two variables is gathered in a pivot table. This table is the 'observed frequencies tables', as it features the data observed by the researcher. Then, one creates the 'theoretical frequencies table', which magnifies the ratio of the frequencies. Finally, a chi-squared table compiles both the theoretical and table, calculating the chi-squared number. Then, one compares the number to p-values, which were the thresholds representing an error percentage of 5% and 1%[25]. In this study, the threshold is set with a higher value than the 1% p-value (Tab. 10).

3. Data analysis

3. 1. Statistical profile of the dataset

With a small population of nineteen manuscripts, the statistical profile of the first table of manuscripts was fragmented. Nonetheless, the chronological repartition of the manuscripts reflected the trend observed by researchers of the *otogi-zōshi* manuscript production[26]. The corpus has fourteen manuscripts of the Edo period, with only four Early Modern period manuscripts, and one from the late Muromachi period (Tab. 1). Other variables were the distribution of size, number of booklets and number of images per manuscript. The proportion of these variables was balanced. For example, the distribution of booklets number within this corpus is of 32% with one booklet, 37% with two booklets and 32% with three booklets (Tab. 2).

The image dataset first addressed materiality of the images. For example, the proportion of fine metals added to the pictural surface were very common, reflecting an opulence in production[27]. Most images had either gold accents, with 60% of them, or silver with 20% (Tab. 3). The hypothesis of the *otogi-zōshi* as lower material seems unfounded from this collection[28]. The rest of the dataset assessed the content of the images themselves.

Women and men were relatively equally present: only 39% of images are without women (Tab. 4)[29]. The depiction of humans was at the core of the iconography, but the number of personages within one image was usually small. Images with one to three individuals are the most common with 48% of the population, then 36% with four to six individuals (Tab. 5). The illuminators placed their interest on narrowing the focus on specific individuals, rather than big groups. Such individualisation of characters is furthered by the emptiness of the background, where space itself is almost a character the images. In most images, the composition is constructed between an indoor and outdoor area, such as a pavilion and a garden. Depending on the closeness of a character to the interior area, and their station within the indoor space, the individual was of higher social standing (Fig. 5)[30].

The final table informs us that the characters were mostly the characters are mostly humans, with only 4% of demons and deities (Tab. 6). The dataset shows that the most common profile is an aristocratic adult male[31]. Indeed, were slightly more represented in this corpus, with 60% of the population being male (Tab. 7). Adults represented 87% of the corpus, with only 9% of children, and the rest as seniors (Tab. 8). The social class dataset had a more intricate distribution. Half of the population was of the aristocrat category. The other categories were more scarcely divided, with the warrior and religious category being prominent. The categories of peasants, workers, and merchants were the most underrepresented (Tab. 9).

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24 Another method of analysis that could have been of interest would be a multifactorial one, which shows conceptual clusters of values that function together. A great summary of its usage and advantages for historians is outlined in the following article: Julien Duval, "L'analyse des correspondances et la construction des champs", *Actes de la recherche en Sciences sociales* 200, no. 5 (2013), 110-123, https://doi.org/10.3917/arss.200.0110.

25 Kirils Makarovs *et al*., *Chi-squared Test* (London: SAGE Publications, 2020), https://doi.org/10.4135/9781526421036905584.

26 Mulard, "Production et réception des manuscrits enluminés japonais des XVIIe et XVIIIe", 28-30.

27 There are several attested methods for the application of fine metals of images, with notably the techniques of either *kinpaku*, *kindei*, and *kirihaku* depending on the period. Mari Izumi, *Hikari wo mato, chūsei kaiga, yamato-e byōbu no bi* (Tokyo: Kadokawa gakugei shuppan, 2007), 101-102. Katsumi Nakae, *Rekishi ni miru "Nihon no iro"* (Tokyo: PHP Kenkyūjo, 2007), 159.

28 In this article the author discusses the perceptions of the *otogi-zōsh*i as a mediocre literary material. Araki, "Otogi-Zoshi and Nara-Ehon: A Field of Study in Flux", 1-20. This opulence of materials also alludes to the system of transmission of these manuscripts up to today. One can observe this in the research made by Hideo Hōjō on books in wedding trousseaux. Hideo Hōjō, "Tokugawa Takehime no konrei to yomeiri-bon", *Tōkai gakuen daigaku kiyō* 6, (1969): 47-56.

29 This can potentially allude to the readership of women in Japan, which were then in turn represented in the books themselves. Peter Kornicki, "Les femmes lectrices dans le Japon du XVIIe siècle", in *Langue, lecture et école du Japon*, ed. Christian Galan and Jacques Fijalkow (Arles: Philippe Picquier, 2006), 305-319.

30 This is observed as well by Mulard, who sees that as the main character Bunshō gains greater status through the story, he moves closer to the pavilion, to end up inside it. Mulard, "Production et réception des manuscrits enluminés japonais des XVIIe et XVIIIe siècles", 422.

31 This reflects the current thematical understanding of the *otogi-zōshi*, where characters are either from the onset aristocrats, or rise to this status. This trajectory from humble beginings to riches, or *risshin shusse* or *shūgimono*, is perfectly described in the following article: Virgina Skord, "Monogusa Tarō. From Rags to Riches and Beyond", *Monumenta Nipponica* 44, no. 2 (1989): 171-198, https://doi.org/10.2307/2384967.

Figure 5. *Discussion scene between individuals of different social standing in Nanakusahime*, Keio University Library, Tokyo, Japan, 110X@314@1, f. 15v of the first booklet, Early Edo period. Source: © Keio University, Keio University Library, Nara Ehon and Emaki Collection. https://dcollections.lib.keio.ac.jp/en/naraehon/110x-314-1

3. 2. Chi-squared tests

The purpose of chi-squared tests was to investigate the dependency between variables. Consequently, it allowed us to assess what is the determinant factor to the sizes of characters, which ultimately defines the system of perspective. The chi-squared tests show that the perspective system relied on multiple factors.

The physicality of a manuscript (e.g. size, number of booklets, number of images) affected the sizes of the characters. Even proportionally, there was a dependency between the small size of a manuscripts and the smallest size of characters (Tab. 10), meaning that the size of the manuscript itself affected the size of the characters. However, the number of images within a manuscript does not affect the size of characters, as a high number of images did not correlate with the larger size of characters (Tab. 12). Likewise, the smaller number of images within a manuscript was independent from the smallest size of characters (Tab. 11). Therefore, the number of images of a manuscript did not affect the sizes of its characters, but its size did. This is an important conclusion, as previous theories only considered the image itself as the meaningful scale of medium to understand character size[32], but their overarching structure mattered as well. Although disputed, the hypothesis of the medium restricting the image is not new but has been explored since the early twentieth century, notably by Henri Focillon on Occidental medieval art[33]. This is further corroborated on the scale of the image as the population had strong effects on the size of characters. The more there were characters in an image, the smaller they became. The chi-squared tests had very high chi-squared numbers (Tabs. 13, 14), implying that the population size in the image particularly affected the size of its characters. Although there was a system of perspective, it remained restricted by material limiations, such as the size of the page, and the number of of individuals depicted in a particular scene.

The scale of the characters assessed more qualitative metrics. Whether on the scale of the manuscripts overall or within one image, the gender discrepancy between sizes is unclear.[34] On the scale of the image, I tested the variable of the biggest character of an image with its gender (Tabs. 15, 16). The result showed no correlation between being a man and being the biggest character of an image. However, the result for women was blurry.

The social class of characters stood out as a clear relevant factor in their size. Each social class was studied independently, both on the scale of the manuscript and the image. On the scale of the manuscript, there was no correlation between being a religious individual and their size (Tab. 18). Whereas, on the level of the image, there was a strong dependency between the fact that a character was religious and them being of the biggest of the image (Tab. 17). However, this category included deities and demons. These characters were usually bigger than the others to to emphasise their non-human nature. This effect was particularly used in the *Bishamon* manuscript (Fig. 6). The lack of dependency with a particular size across manuscripts shows that deities and demons did not need to be particularly big, but only bigger than the other characters of the image to allude to their supernatural nature[35].

Figure 6. *Prince being pursued by a demon in Bishamon no Honji*, Keio University Library, Tokyo, Japan, 110X@278@3@3, f. 12 of the third booklet, Early Modern period. Source: © Keio University, Keio University Library, Nara Ehon and Emaki Collection. https://dcollections.lib.keio.ac.jp/en/naraehon/110x-278-3-3

The peasant category, on the level of manuscripts and images was negative. There was no dependency

32 Sano, *Jikkuri mitai Genji monogatari emaki*. Takahashi, *Monogatari to e no enkinhō*.

33 Henri Focillon, *La vie des formes suivi de Eloge de la main* (Paris: Presses Universitaire de France, 2013), https://doi.org/10.3917/puf.focil.2013.01.

34 Once again, this presence and visibility of women in Japanese literature can be explained by its readership, as well as the text themselves being used as educational material for women. Haruki Li, "Didactic Readings of the Tale of Genji, Politics and Women's education," in *Envisioning The Tale of Genji. Media, Gendre, and Cultural Production*, ed. Haruo Shirane (New York: Columbia University Press, 2008), 157-170.

35 In the "monster catalogue" section, the author reflects on the importance of a large size as a feature of monstrosity. Adam Kabat, *The River Imp and the Stinky Jewel and Other Tales: Monster Comics from Edo Japan* (New York: Columbia University Press, 2023), 3.

with any category of size (Tabs. 19, 20). The statistical profile highlights however that the peasant category was highly underrepresented. The negative results might relate to the smaller pool of characters.

The merchant category was the most polarized social category. On the level of the manuscript, they were simultaneously dependent on the biggest and the smallest size category of characters within the manuscripts (Tabs. 21, 22). The social category of merchants in Pre-Modern Japan was poorly perceived socially[36]. The dependency with the smallest size of characters reflected the social perception of these individuals as socially small[37]. Yet, some of these tales narrated the felicitous tales of servant gradually gaining power and money through trade and then attain a higher social standing[38]. The *Bunshō Sōshi* is a good example such a narrative trajectory[39]. These individuals were the main characters of their stories, which correlates with a larger size.

The aristocratic class was the most represented in this corpus. Like merchants, on the scale of manuscripts, they tended to be of the biggest or the smallest size (Tabs. 23, 24). However, this size trend alludes to different conclusions. The artificial category of 'aristocrat' did not reflect important nuances. Indeed, the tales portrayed a large variety of aristocratic figures, from an emperor to a provincial *daimyo*[40]. In *Hamochi no Chujo*, the emperor sits behind a curtain with other aristocrats (Fig. 7). Although partly visible, the emperor remained the biggest character within the image. Depending on the context, even if an individual was an aristocrat, they would still be of the lowest social status within a given image[41]. Overall, it is clear that the social class of a character affected their size, and the subsequent composition of the image and perspective.

I finally focused on the link between narration and character size. On the scale of the manuscript, the two extreme categories were positive (Tabs. 25, 26). The main characters on the level of the manuscript had very polarized sizes. On the scale of the image there was a high dependency between being a main character and being the biggest character (Tab. 27). Consequently, the main character was usually the biggest of any image. The fluctuation between the smallest or the biggest size on the scale of the manuscript comes from a playful usage of social status for comical means[42]. In the *Bunshō Sōshi*, the main character became a wealthy merchant, and was usually the largest owing to his position in the narration. However, to visually ridicule him in the presence of highly educated aristocrats, he is represented as one of the smallest characters of the image (Fig. 2). Thereby, these visual tools on perspective were not rigid, but it was a conscious one that could be twisted for comical effect.

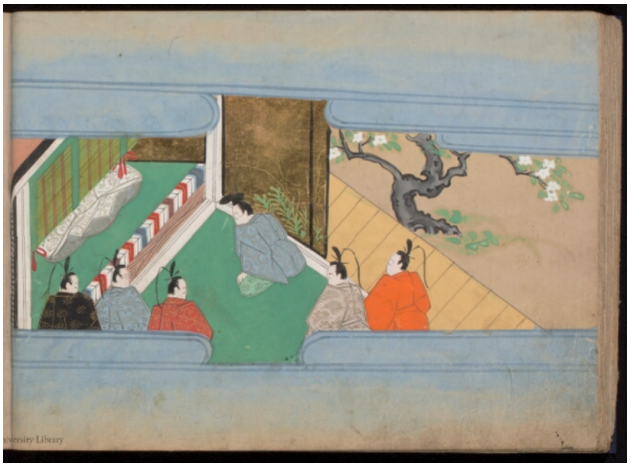

Figure 7. *Encounter with the emperor in Hamochi no Chujo*, Keio University Library, Tokyo, Japan, JL@2A@1366@3@1, f. 19v of the first booklet, Early Edo period. Source: © Keio University, Keio University Library, Nara Ehon and Emaki Collection. https://dcollections.lib.keio.ac.jp/en/naraehon/jl-2a-1366-3-1

4. Hypothesis on sizes

4.1. Floating theories on the perspective system in Japanese images

The prior efforts to analyse the perspective system in Japanese images were met with unavoidable issues. Most of the knowledge was anecdotical because there was no systematic study of the size of characters in relation to perspective. The surface area is a specifically misleading to the naked eye. Furthermore, the studies suffered from issues of standard, as manuscripts varied in sizes, hindering cross-manuscript comparisons. Outside of the scale, there was a sample issue as the studies were based mostly on aristocratic literature[43]. The uniformity of those samples shed light only little narration as there was no social discrepancy.

The two main theories to understand these images were the "psychological" and "pluralistic" perspective[44]. With regards to the collected data

36 Haruko Wakita, "Fêtes Et Communautés Urbaines Dans Le Japon Médiéval : La Fête De Gion à Kyôto", *Annales : Histoire, Sciences Sociales* 52, no. 5 (1997): 1039-1056.

37 This can be percieved as the representation of class tension, with aristocratic classes trying to maintain a higher social status despit the growth of social mobility during the Muromachi era. The principle of upside-down world coined by Souyri reflects these tensions.

38 As the stories of *risshin shusse* or *shūgimono*. Virgina Skord, "Monogusa Tarō. From Rags to Riches and Beyond", *Monumenta Nipponica* 44, no. 2 (1989): 171-198, https://doi.org/10.2307/2384967.

39 Barbara Ruch, "Origins of The Companion Library: An Anthology of Medieval Japanese Stories", *The Journal of Asian Studies* 30, no. 3 (1971): 593-610, https://doi.org/10.2307/2052463.

40 The status of a *daimyo* refers to a provincial feudal lord. "Daimyo," in *A Dictionary of World History*, ed. Anne Kerr, and Edmund Wright (Oxford: Oxford University Press, 2015), https://www.oxfordreference.com/view/10.1093/acref/9780199685691.001.0001/acref-9780199685691-e-1003.

41 In this text the author expresses the challenges, and changes in the research on high social classes alongside marginal social classes. The author offers a bibliographical review of the current research on social classes. Guillaume Carré, "Les marges statutaire dans le Japon prémoderne: enjeux et débats", *Annales. Histoire, Sciences Sociales* 66, no. 4 (2011): 955-976.

42 Professor Laura Moretti is currently working on a project on humour and playfulness in Japanese literature, https://www.ames.cam.ac.uk/research/project/play-playful-reading-early-modern-japan. The author mentions such humour an article in 2013. Laura Moretti, "Intertextual Divertissement, Sexual Education and Entertaining Humor: The World of Onna enshi kyōkun kagami", *Japan Review* 26, (2013): 195-212.

43 Reginald R. Jackson, "Dying in Two Dimensions: Genji Emaki and the Wages of Depth Perception", *Mechademia* 7, no. 1 (2012): 149-172.

44 See for the "psychological perspective": Takahashi, *Monogatari to e no enkinhō*. See for the "pluralistic or multiple perspective": Sano, *Jikkuri mitai Genji monogatari emaki*.

of this study, the system of Tōru Takahashi of the "psychological perspective"[45] was the most accurate. The term "psychological" refers to a perspective relying on narration to convey a sense of space. Characters were sized depending on their position in the story—rendering the psychological sensibilities of the narration, rather than a cartesian spatial order[46]. Images did not depict a physical but a narrative reality. This study confirms that the narrative role of a character greatly impacts their size (Tab. 27). However, Takahashi only analysed the image without considering the broader context of the codex. The scale of the manuscript was essential, as we observed, since images alone were deceiving, which moderates the importance of the size on the scale of the image.

Importantly, other factors were essential to the character size. If the main character was not an aristocrat, they might not have the proportionally biggest size within an image. For example, in *Giō* the main characters, two sisters, were always smaller than a former aristocratic priest (Fig. 8). Character size was impacted by their position in the narration, the manuscript format, the social standing of a character, and comical visual tropes.

Figure 8. *The sisters leaving in Giō*, Keio University Library, Tokyo, Japan, 110X@409@2@1, f. 4v of the first booklet, Early Edo period. Source: © Keio University, Keio University Library, Nara Ehon and Emaki Collection. https://dcollections.lib.keio.ac.jp/en/naraehon/110x-409-2-1

The theory of Sano Midori of the "pluralistic perspective"[47] focused on the spatial organisation of characters. She hypothesised that there were multiple vanishing points, implying a multiple perspective. This study cannot validate or invalidate this theory as it is based on the visual organisation of the image. However, the sole focus on the scale of the image rather than the manuscript limits the validity of her theory. Overall, the two theories do not oppose themselves completely, but the point of Tōru Takashi seems more probable.

4. 2. A multifactor theory on size

Both Takahashi and Sano's theories on perspective were based on a single element of analysis, namely either the "psychological" or "multiple". However, these hypotheses lacked flexibility towards the complexity of the images. Unlike with the linear perspective[48] of Occidental images, Japanese ones did not bother with naturalistic space depth, offering greater flexibility in composition, and playful usages of it. Furthermore, these theories did not take into consideration the importance of the materiality of the manuscript, the social status of a character, and humour.

To gain a more accurate understanding of the size of characters, various scales of analysis need to be considered. On the scale of the image, there were medium restrictions. For example, when a lot of characters were depicted, they were portrayed as smaller to accomodate their number within an unchanged sized page. There were other iconographic visual necessities, if a character was a child, regardless of their position in the tale, they were the smallest of the image (Fig. 9). The manuscript scale allowed to grasp a systematic scale, which refined and moderated the character sizes.

In the corpus, empty space was an essential element to the visual economy of the image. Unlike the *emaki* format, the space was restricted to the format of a page[49]. I observed with the *nara-ehon* format a hyper-consciousness of space as a tool for narration, leading to an economy of emptiness. Each image had an allotted amount of space and the painter had to work within this specific and limited space without variation, except for the rare occurrences of double images. This economy of space was reflected in the changes of the size of characters regarding the size of the manuscript, which illuminators used playfully.

Figure 9. *Introductory image of Tokiwa no uba*, Keio University Library, Tokyo, Japan, 220@58@1, f. 4v of the first booklet, Early Edo period. Source: © Keio University, Keio University Library, Nara Ehon and Emaki Collection. https://dcollections.lib.keio.ac.jp/en/naraehon/220-58-1

45 The "psychological perspective" is called *shinteki enkinhō*, see in Takahashi, *Monogatari to e no enkinhō*, 9-13.
46 Takahashi, *Monogatari to e no enkinhō*, 9-13.
47 The "pluralistic perspective" is called *tagenteki na shiten.* Sano, *Jikkuri mitai Genji monogatari emaki*.
48 Stephen Miller, *The Word made Visible in the Painted Image: Perspective, Proportion, Witness and Threshold in Italian Renaissance Painting* (Newcastle upon Tyne: Cambridge Scholars Publishing, 2016).
49 The *emaki* were horizontal illuminated scrolls, which were not constructed with a uniform pagination of a codex. One of the greatest specialists of the emaki as an artistic medium is Junji Wakasugi, with the following reference as a great starting point for a synoptic approach to the *emaki*: Junji Wakasugi, *Emakimono no kanshō kiso chishiki* (Tokyo: Shibundō, 1995).

5. Conclusion

The size of characters depended on a multifactor system, where the manuscript, narration, social class, and humour were equally important factors to determine the size of a character. The system of perspective was not a naturalistic one, but reflected the content of the story whilst being restricted by medium constraints of the manuscript. The scales of dependence between the manuscripts and the images were particularly apparent with the question of social class and gender. The social category of characters had a real importance in their figuration. Narration also was essential to the size of characters. However, visual norms could be modified for comical purposes, even by inverting them. These images represented the other world of the *otogi-zōshi*. In this fictious world, felicitous tales took humble characters to the aristocratic status, and conversely aristocrats fell into social dishonour. Yet, characters of popular origins were still subject to visual mockery for their lack of aristocratic education and culture. In this upside-down world, fiction offers an inverted mirror[50].

6. Tables

6.1. Data profile

Table 1. Disparity of dates amongst manuscripts. Source: author.

Date	Numeral quantity	Percentage
Muromachi	1	5%
Edo	14	74%
Early Modern	4	21%
Total	19	100%

Table 2. Disparity of number of booklets amongst manuscripts (the percentages outside of the total were rounded up). Source: author.

Number of booklets	Numeral quantity	Percentage
One booklet	6	32%
Two booklets	7	37%
Three booklets	6	32%
Total	19	100%

Table 3. Disparity of metals amongst images. Source: author.

Mental accents in images	Numeral quantity	Percentage
Images with gold	147	60%
Images with silver	49	20%
Images with nothing	48	20%
Total	244	100%

Table 4. Disparity of women amongst images. Source: author.

Women in images	Numeral quantity	Percentage
With women	148	61%
Without women	96	39%
Total	244	100%

Table 5. Disparity of number of individuals present within one image[51]. Source: author.

Number of individuals	Numeral quantity	Percentage
One to three individuals	115	48%
Four to six individuals	87	36%
Seven and over individuals	39	16%
Total	241	100%

Table 6. Disparity of humans amongst characters. Source: author.

Humans in images	Numeral quantity	Percentage
Human	997	96%
Non-human	43	4%
Total	1040	100%

Table 7. Disparity of gender amongst characters. Source: author.

Gender	Numeral quantity	Percentage
Men	622	60%
Women	382	37%
Both/Unknown	36	3%
Total	1040	100%

Table 8. Disparity of age amongst characters. Source: author.

Age	Numeral quantity	Percentage
Adult	905	87%
Child	89	9%
Senior	30	3%
Unknown	16	2%
Total	1040	100%

Table 9. Disparity of social class amongst characters[52]. Source: author.

Social class	Numeral quantity	Percentage
Religious	104	10%
Aristocrat	563	54%
Warrior	188	18%
Peasant	9	1%
Artist and artisan	35	3%
Merchant	58	6%
Worker	80	8%
Non identifiable	100	10%
Total	1137	100%

50 Souyri, *Le Monde à L'Envers, la dynamique de la société médiévale*, 201-213.

51 The total number of images in the numeral quantity is lower than the number of images because there are three images in the corpus without human characters.

52 The total number of individuals in the numeral quantity is higher than the number of actual characters studied because there is some overlap between social classes with certain characters. For example, some characters were both aristocrats and religious individuals.

6.1. Chi-squared tests

Table 10. Chi-squared test for smallest size of manuscript with the smallest size of characters[53]. Source: author.

Observed data table			
Indiv_S_1			
Manu_Size_ Under	**Yes**	**No**	**Total**
Yes	112	353	465
No	97	478	575
Total	209	831	1040
	20,1%	79,9%	
Expected data table			
Indiv_S_1			
Manu_Size_ Under	**Yes**	**No**	**Total**
Yes	93,4471154	371,552885	465
No	115,552885	459,447115	575
Total	209	831	1040
Chi-squared table			
Indiv_S_1			
Manu_Size_ Under	**Yes**	**No**	**Total**
Yes	3,68346873	0,9264079	4,60987663
No	2,97880515	0,74918204	3,72798719
Total	6,66227388	1,67558994	8,33786382
Chi-squared number			8,33786382
Chi-squared 5% threshold			3,84145882
Chi-squared 1% threshold			6,6348966

Table 11. Chi-squared test for smallest number of images within a manuscript with the smallest size of characters. Source: author.

Chi squared table	**Indiv_S_1**		
Manu_Im_1	**Yes**	**No**	**Total**
Yes	1,097782609	0,27609695	1,373879559
No	0,349231223	0,08783312	0,437064346
Total	1,447013832	0,36393007	1,810943905
Chi-squared number	1,810943905		
Chi-squared 5% threshold	3,841458821		
Chi-squared 1% threshold	6,634896601		

Table 12. Chi-squared test for biggest number of images within a manuscript with the biggest size of characters. Source: author.

Chi-squared table	**Indiv_S_5**		
Manu_Im_15	**Yes**	**No**	**Total**
Yes	0,6520583	0,1620361	0,8140944
No	0,80945168	0,20114826	1,01059994
Total	1,46150999	0,36318435	1,82469434
Chi-squared number	1,82469434		
Chi-squared 5% threshold	3,84145882		
Chi-squared 1% threshold	6,6348966		

Table 13. Chi-squared test for smallest number of characters within an image with the biggest size of characters. Source: author.

Chi-squared table	**Indiv_S_5**		
Im_Indiv_1	**Yes**	**No**	**Total**
Yes	16,6153954	4,12891578	20,7443112
No	5,20280058	1,29289282	6,4956934
Total	21,818196	5,42180861	27,2400046
Chi-squared number	27,2400046		
Chi-squared 5% threshold	3,84145882		
Chi-squared 1% threshold	6,6348966		

Table 14. Chi-squared test for biggest number of characters within an image with the smallest size of characters. Source: author.

Chi-squared table	**Indiv_S_1**		
Im_Indiv_7	**Yes**	**No**	**Total**
Yes	12,7603574	3,20928363	15,969641
No	6,66976222	1,67747329	8,34723551
Total	19,4301196	4,88675692	24,3168765
Chi-squared number	24,3168765		
Chi-squared 5% threshold	3,84145882		
Chi-squared 1% threshold	6,6348966		

Table 15. Chi-squared test for biggest character within an image with an individual being of the male gender. Source: author.

Chi-squared table	**Indiv_Big**		
Indiv_Men	**Yes**	**No**	**Total**
Yes	0,57914763	0,17468658	0,75383422
No	0,86179385	0,25994032	1,12173417
Total	1,44094148	0,4346269	1,87556838
Chi-squared number	1,87556838		
Chi-squared 5% threshold	3,84145882		
Chi-squared 1% threshold	6,6348966		

[53] This table is used as an example of a full chi-squared test; however, the following only feature the results found in the final table.

Table 16. Chi-squared test for biggest character within an image with an individual being of the female gender. Source: author.

Chi-squared table	Indiv_Big		
Indiv_Wom	Yes	No	Total
Yes	2,0523828	0,61905414	2,67143694
No	1,19150491	0,35939009	1,550895
Total	3,24388771	0,97844423	4,22233194
Chi-squared number	4,22233194		
Chi-squared 5% threshold	3,84145882		
Chi-squared 1% threshold	6,6348966		

Table 17. Chi-squared test for biggest character within an image with an individual being religious. Source: author.

Chi-squared table	Indiv_Big		
Indiv_C_Reli	Yes	No	Total
Yes	11,8510373	3,57459324	15,4256306
No	1,31678193	0,39717703	1,71395895
Total	13,1678193	3,97177027	17,1395895
Chi-squared number	17,1395895		
Chi-squared 5% threshold	3,84145882		
Chi-squared 1% threshold	6,6348966		

Table 18. Chi-squared test for smallest size range character with an individual being religious. Source: author.

Chi-squared table	Indiv_C_ Reli		
Indiv_S_1	Yes	No	Total
Yes	0,05789474	0,00643275	0,06432749
No	0,01456077	0,00161786	0,01617863
Total	0,07245551	0,00805061	0,08050612
Chi-squared number	0,08050612		
Chi-squared 5% threshold	3,84145882		
Chi-squared 1% threshold	6,6348966		

Table 19. Chi-squared test for smallest size range character with an individual being a peasant. Source: author.

Chi-squared table	Indiv_C_ Pes		
Indiv_S_1	Yes	No	Total
Yes	0,36	0,00	0,36
No	0,09	0,00	0,09
Total	0,45	0,00	0,46
Chi-squared number	0,4564328		
Chi-squared 5% threshold	3,84145882		
Chi-squared 1% threshold	6,6348966		

Table 20. Chi-squared test for biggest size range character with an individual being a peasant. Source: author.

Chi-squared table	Indiv_C_ Pes		
Indiv_S_5	Yes	No	Total
Yes	1,79134615	0,01563736	1,80698351
No	0,44514844	0,00388587	0,44903432
Total	2,2364946	0,01952323	2,25601783
Chi-squared number	2,25601783		
Chi-squared 5% threshold	3,84145882		
Chi-squared 1% threshold	6,6348966		

Table 21. Chi-squared test for smallest size range character with an individual being a merchant. Source: author.

Chi-squared table	Indiv_C_ Merch		
Indiv_S_1	Yes	No	Total
Yes	5,02848	0,2969978	5,32547781
No	1,2646839	0,0746962	1,3393801
Total	6,2931639	0,371694	6,6648579
Chi-squared number	6,6648579		
Chi-squared 5% threshold	3,84145882		
Chi-squared 1% threshold	6,6348966		

Table 22. Chi-squared test for biggest size range character with an individual being a merchant. Source: author.

Chi-squared table	Indiv_C_ Merch		
Indiv_S_5	Yes	No	Total
Yes	6,19357276	0,36581183	6,5593846
No	1,53909911	0,09090402	1,63000314
Total	7,73267188	0,45671585	8,18938773
Chi-squared number	8,18938773		
Chi-squared 5% threshold	3,84145882		
Chi-squared 1% threshold	6,6348966		

Table 23. Chi-squared test for smallest size range character with an individual being an aristocrat. Source: author.

Chi-squared table	Indiv_C_ Aristo		
Indiv_S_1	Yes	No	Total
Yes	11,5448238	13,6262805	25,1711042
No	2,9035718	3,42706693	6,33063873
Total	14,4483956	17,0533474	31,501743
Chi-squared number	31,501743		
Chi-squared 5% threshold	3,84145882		
Chi-squared 1% threshold	6,6348966		

Table 24. Chi-squared test for biggest size range character with an individual being an aristocrat. Source: author.

Chi-squared table	Indiv_C_ Aristo		
Indiv_S_5	**Yes**	**No**	**Total**
Yes	12,8463595	15,1624746	28,008834
No	3,19231262	3,76786583	6,96017845
Total	16,0386721	18,9303404	34,9690125
Chi-squared number	34,9690125		
Chi-squared 5% threshold	3,84145882		
Chi-squared 1% threshold	6,6348966		

Table 25. Chi-squared test for smallest size range character with an individual being a main character. Source: author.

Chi-squared table	Indiv_Main		
Indiv_S_1	**Yes**	**No**	**Total**
Yes	5,49769697	1,2928076	6,79050458
No	1,38269394	0,32514656	1,7078405
Total	6,88039092	1,61795416	8,49834508
Chi-squared number	8,49834508		
Chi-squared 5% threshold	3,84145882		
Chi-squared 1% threshold	6,6348966		

Table 26. Chi-squared test for biggest size range character with an individual being a main character. Source: author.

Chi-squared table	Indiv_Main		
Indiv_S_5	**Yes**	**No**	**Total**
Yes	5,40171025	1,2702359	6,67194615
No	1,34232175	0,31565286	1,65797461
Total	6,744032	1,58588876	8,32992076
Chi-squared number	8,32992076		
Chi-squared 5% threshold	3,84145882		
Chi-squared 1% threshold	6,63489666		

Table 27. Chi-squared test for biggest size character within an image with an individual being a main character. Source: author.

Chi-squared table	Indiv_Main		
Indiv_Big	**Yes**	**No**	**Total**
Yes	23,90348111	5,62100862	29,5244897
No	7,209936104	1,69544816	8,90538426
Total	31,11341721	7,31645678	38,429874
Chi-squared number	38,42987399		
Chi-squared 5% threshold	3,841458821		
Chi-squared 1% threshold	6,634896601		

7. Sources and bibliographic references

7.1. Sources

Keio University Library, Tokyo, early Edo period, 16.7 x 24.2 cm, あみだの本地, *Amida no honji*, 110X@274@3@1-3.

Keio University Library, Tokyo, early Modern period, 16.5 x 24.6 cm, 毘沙門の本地, *Bishamon no honji*, 110X@278@3@1-3.

Keio University Library, Tokyo, late sixteenth century–early seventeenth century, 17.5 x 25.4 cm, 文正草子, *Bunshō sōshi*, 110X@445@3@1-3.

Keio University Library, Tokyo, early Edo period, 17.9 x 25.2 cm, ふせやのものかたり, *Fuseya no monogatari*, 110X@400@1.

Keio University Library, Tokyo, early Edo period, 18.5 x 25.6 cm, 祇王, *Giō*, 110X@409@2@1-2.

Keio University Library, Tokyo, early Edo period, 16.8 x 23.8 cm, はもちの中将, *Hamochi no chūjō*, JL@2A@1366@3@1-3.

Keio University Library, Tokyo, early Edo period, 16.0 x 23.1 cm, はしひめ, *Hashi hime*, 110X@273@2@1-2.

Keio University Library, Tokyo, early Edo period, 18.3 x 27.1 cm, 判官みやこばなし, *Hōgan miyako banashi*, 110X@315@1.

Keio University Library, Tokyo, early Modern period, 18.0 x 29.2 cm 磯崎, *Isozaki*, 110X@299@1.

Keio University Library, Tokyo, early Edo period, 18.5 x 26.5 cm, 景清, *Kagekiyo*, 110X@408@2@1-2.

Keio University Library, Tokyo, early Edo period, 16.6 x 24.1 cm, かんのんのほんじ, *Kannon no honji*, 110X@226@2@1-2.

Keio University Library, Tokyo, early Modern period, 17.1 x 25.4 cm, かざしのひめ, *Kazashi no hime*, 110X@280@1.

Keio University Library, Tokyo, early Edo period, 17.2 x 24.9 cm, 小伏見物語, *Kofushimi Monogatari*, 110X@449@3@1-3.

Keio University Library, Tokyo, early Edo period, 24.6 x 32.3 cm, 七草ひめ, *Nanakusa hime*, 110X@314@1.

Keio University Library, Tokyo, early Edo period, 16.7 x 24.2 cm, 六代御前物語, *Rokudaigozen Monogatari*, 110X@237@3@1-3.

Keio University Library, Tokyo, early Edo period, 15.9 x 23.6 cm, たからくらべ, *Takarakurabe*, 110X@228@2@1-2.

Keio University Library, Tokyo, early Edo period, 15.9 x 23.1 cm, 玉たすき, *Tamatasuki*, 110X@227@2@1-2.

Keio University Library, Tokyo, early Edo period, 17.9 x 25.7 cm, 常盤の嫗, *Tokiwa no uba*, 220@58@1.

Keio University Library, Tokyo, early Modern period, 15.8 x 23.3 cm, ゆみつぎ, *Yume tsugi*, 110X@302@2@1-2.

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