Figurative representations of the Pali Aike volcanic field (Santa Cruz, Argentina - Magallanes, Chile) in comparative perspective with the southern extreme of Patagonia

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ABSTRACT – This paper aims to make a comparison of the figurative representations of the Pali Aike volcanic field (province of Santa Cruz, Argentina – province of Magallanes, Chile) with those registered in other sectors of southern Patagonia, such as the southern shore margin of Lake Argentino (Argentina), the Morros area and the Cerro Benítez-Lago Sofía locality (Chile) during the middle and late Holocene. This analysis was based on integrating background and new information related to different areas. The goal is to evaluate the existence of diverse patterns of representation, considering the morphologies, technical treatment, frequencies, relative abundance of types of motifs in each area, distribution within the space, and temporality of figurative motifs. From this, it is expected to advance the discussion of information exchange among hunter-gatherer groups through figurative representations on a macroregional scale.

KEY WORDS – rock art; information circulation; hunter-gatherers; Holocene

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IZVLEČEK – Cilj članku je primerjava figurativnih upodobitev na vulkanskem polju Pali Aike (pokrajina Santa Cruz, Argentina – pokrajina Magallanes, Čile) z upodobitvami, ki so zabeležene na drugih območjih južne Patagonije, kot so južno obrežje jezera Argentino (Argentina), območje Morros in območje Cerro Benítez-Lago Sofía (Čile) v srednjem in poznejm holocenu. Analiza temelji na integraciji obstoječih in novih informacij, ki so povezane z različnimi območji. Cilj je oceniti obstoj različnih vzorcev upodobitve, pri čemer upoštevamo morfologije, tehnično obdelavo, pogostost, relativne zgodovine vzorcev vrst motivov na posameznem območju, razporeditev v prostoru in časovnost figurativnih motivov. Pričakujemo, da bomo na podlagi tega napredovali v razpravi o izmenjavi informacij med lovskimi in nabiralnimi skupinami s figurativnimi upodobitvami na makroregionalni ravni.

KLJUČNE BESEDE – skalne poslikave; kroženje informacij; lovi-nabiralci; holocen
Introduction

The settlement process in Patagonia involved significant changes in mobility, settlement, and resource appropriation strategies. This process, in turn, implied changes in the circulation of information between hunter-gatherer groups, a process that can be seen reflected in rock art (Ascher 1988; Carden 2008; Fiore 2006; Re 2010; Whallon 2011). For this reason, it is expected that differences will be observed in the composition, density, and distribution of these manifestations at different spatial scales and throughout occupational history (Barton et al. 1994; Wobst 1977). Rock representations thus acquire theoretical-methodological relevance since they constitute an instance of niche construction through the transformation of the environment (Odling-Smee et al. 2003) and can be used as an indicator of human mobility throughout a region (Belardi et al. 2016).

Various investigations of rock art have been carried out at large spatial scales in southern Patagonia between the Santa Cruz River to the north and the Strait of Magellan to the south (Carden et al. 2009; Charlin, Borrero 2012; Fiore 2006; Manzi, Carballo Marina 2012; Muñoz Soto et al. 2021). These works were based on the review and verification of information available in both their publications and those of other research teams. In this framework, analysing large-scale rock art manifestations thus acquires considerable challenges due to the different methodologies used and the possible lack of data in the oldest research records (Fiore, Hernández Llosas 2007).

In the present paper, the figurative motifs (sensu Gardin 1978) located in the extreme south of southern Patagonia are of interest since they turn out to be a robust line of evidence to study the mobility of human populations and the circulation of information on a macro-regional scale that occurred over time among hunter-gatherer groups that inhabited different areas. In this sense, the figurative rock representations of the PAVF (Santa Cruz, Argentina-Magallanes, Chile) will be analysed from a comparative perspective with the Zona de Morros (ZM) (Santa Cruz, Argentina-Magallanes, Chile), the southern margin of Lake Argentino (SMLA) (Argentina) and the archaeological locality Cerro Benítez-Lago Sofia (CB-LS) (Chile) (Fig. 1).

Pioneering research in the study area has indicated that the rock art of the extreme south of southern Patagonia was mainly characterized by the predominance of complex symbols (Menghin 1957) or abstract-geometric motifs (Bate 1970; 1971). In this framework, the rock art manifestations of the Pali Aike volcanic field (PAVF) were included within the so-called Río Chico Style (sensu Bate 1970; 1971) based on the concentration of paintings in sites near the said river. The predominance of abstract designs initially characterized this style compared to less variability and frequency of figurative representations, most of these motifs being made in red tones, with less presence of black and white (Bate 1970; 1971; Charlin et al. 2023b). At the temporal level, this style was assigned to the late Holocene, taking into consideration relative bases and indirect dating (Bate 1970; Gómez Otero 1989–1990; Prieto et al. 1998). Subsequently, Mauricio Massone (1982) took up the work started by Luis Felipe Bate (1970; 1971) based on new investigations in sites with rock art from the PAVF and CB-LS, differentiating two sub-styles for southern Patagonia: the Lago Sofía modality, in which the predominate dotted motifs, and the previously mentioned Río Chico modality, characterized by a greater emphasis on linear figures.

Over the years, records of rock art in the area have been supplemented by investigations carried out by different researchers (Molina 1972; 1976; Sanguineti de Bórmaid 1982). Thus, during the 1980s and 1990s, studies carried out at the PAVF revealed the presence of rock art in the middle valley of the Gallegos River, in the interfluve of the Gallegos-Chico rivers (Gómez Otero 1983–1985), and the Chico River basin (Hernández Llosas et al. 1999). In the 2000s, with the expansion of the sampling, Liliana M. Manzi and Flavia Carballo Marina (2012) revealed new locations with paintings in the Gallegos River basin and in the Gallegos-Chico interfluve while integrating, in a supra-regional scheme, previously published information making comparisons of classes and diversity of motifs. Besides, through a Principal Component Analysis on a presence-absence matrix of types of motifs (figurative and non-figurative) and techniques, Judith Charlin and Luis Alberto Borrero (2012) noted differential trends between the PAVF and other close sectors of the current national territories of Argentina and Chile, such as the Zona de Morros (ZM), the southern margin of Lake Argentino (SMLA) and Última Esperanza (UE) (Fig. 1). This investigation demonstrated the existence of differential patterns of visual marking between these regions that are reflected in a predominance in the PAVF of linear geometric motifs, while in the
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UE punctiform geometric motifs predominate. On the other hand, according to published data, anthropomorphic and zoomorphic motifs would be the most abundant in the SMLA. Likewise, the authors have pointed out that the sites located in the eastern steppe (PAVF) and the mountainous zone (CB-LS and SMLA) show different archaeological signatures that could belong to diverse archaeological populations (Borrero, Charlin 2010), although these differences in the archaeological record do not seem to correlate with rock art (Charlin, Borrero 2012). A posteriori, Manzi and co-authors (2015) reported the presence of motifs engraved in chopped and incised techniques as novel forms of execution in the rock art of PAVF, registering designs comparable to those recognized within the Río Chico Style.

In recent times, the archaeological investigations carried out in the PAVF have yielded new advances in rock art, particularly new data on the distribution and variability of painted and engraved representations in the PAVF, showing a greater diversity of figurative expressions (Charlin 2014; Charlin et al. 2023a; 2023b; Manzi et al. 2015; 2019; 2022). In this scenario, the discovery of engraved camelids in the Argentine sector of the PAVF has also been a novelty for research on rock art in southern Patagonia. The age of these representations could be assigned to the middle Holocene based on the morphological similarity they present with similar motifs painted in other regions of the Province of Santa Cruz (Manzi et al. 2022). It is understood that these morphological similarities on a large spatial scale could provide data on social interaction, information circulation, and mobility circuits of the hunter-gatherer groups that inhabited the southern tip of Patagonia. This new set of rock representations questions the absence of engravings south of the Santa Cruz River (Fiore 2006) and the scarcity of figurative motifs in PAVF (Bate 1970; 1971; Massone 1982) and its late character (Bate 1970; 1971; Charlin, Borrero 2012; Hernández Llosas et al. 1999; Gómez Otero 1989–1990; Massone 1982; Prieto et al. 1998).

This study thus aims to conduct a comparative analysis of the figurative rock representations in the PAVF, the CB-LS locality, the SMLA, and the ZM, considering both their formal properties and spatial and temporal distribution. Through this analysis, we seek to contribute to the discussion on the circulation of information and communication at the macro-regional level in the extreme south of southern Patagonia.

Methodology

In the present work, each region under study corresponds to a mesospatial scale that, when considered together, makes up a larger surface that refers to a macroregional scale (sensu Dincauze 2000) (Fig. 1). In addition, a mesotemporal scale (sensu Dincauze 2000) will be used since it is of interest to analyse the sites that present figurative manifestations executed throughout the Holocene. In this framework, although the study of rock art can vary in scale, using regional or macroregional scales generally tends to be fruitful since redundancy patterns can be recognized in the selection of places with paintings and/or engravings and, to some extent, to understand long-standing preferences for specific geographic locations (Charlin, Borrero 2012).

Fig 1. Study area location. ZM: Zona de Morros.
The sample under analysis was generated by integrating published data on figurative representations of the study macroregion, added to unpublished material from the PAVF product of the work carried out by the work team (Tab. 1). The units of analysis considered here are the site, the motif, and the element. In conceptual terms, the site is understood as a locus of concentrations of grouped or isolated rock motifs (Gradin 1978). Besides, the motif, as a minimum unit of analysis, is considered an execution unit motivated by a single act of painting, whether simple or compound designs with more than one element (Aschero 1988; Gradin 1978). The concept of ‘element’ is used to refer to the initial segmentation of separate discrete units in the support space, being defined based on their formal properties, both technical and morphological (Gradin 1978; Re 2010).

In the case of the records of the rock representations carried out by our work team, the general guidelines proposed by various authors were followed (Fiore 2009; 2011; Hernández Llosas 1985). In each case, the morphology of the represented motifs was documented, and other data such as size, colour, overlaps, and frequency were recorded (Fiore 2011) if the available literature allowed this information to be identified.

Regarding the morphological characterization of the types of figurative motifs, the following categories have been used: (a) anthropomorphic: motif/image whose shape resembles the human figure, with a greater or lesser degree of detail; (b) hand: motif whose potential referent is a hand; (c) finger: motif whose potential referent is a finger; three-digits (bird tracks): motif potentially refers to bird footprints or traces, such as the rhea (Rhea pennata). Among the execution techniques of the rock art representations, a first differentiation is made between paintings and engravings. Regarding the technical treatment, a distinction was made between punctiform, linear, flat, and combined (Hernández Llosas 1985). However, in the cases in which information on the technical treatment could not be obtained from the available bibliographic sources, detailed information on the matter was not provided. On the other hand, in the case of the painted motifs that make up our records, the current colour was characterized based on its comparison with the Munsell Soil Colour Chart catalogue (1994). As far as superposition is concerned, it is understood as when one motif is placed on top of another, partially or almost fully covering it (Aschero 1988).

Based on the literature consulted 105 archaeological sites with rock art were identified and differentially distributed within the study macroregion (Tab. 1), with most (close to 70%) concentrated in the PAVF region (Bate 1970; 1971; Campan et al. 2007; Charlin 2014; Gallardo 2009; Gómez Otero 1983–1985; Hernández Llosas 1992; Hernández Llosas et al. 1999; Manzi, Carballo Marina 2012; Manzi et al. 2015; 2019; 2022; Massone 1982; Molina 1969; 1972; Prieto 1989–1990; Prieto et al. 1998) (Tab. 1 and Fig. 1). The remaining sites are less frequently found in the SMLA (Belardi 2003; Belardi et al. 1999; 2000; Carballo Marina et al. 1999; Franco et al. 1999; Moreno 1969), CB-LS and UE (Bate 1971; Massone 1982; Muñoz 2020; Sepúlveda 2011). Exceptionally, a site with rock art was recorded in the Zona de los Morros (ZM) (Bate 1970; Charlin et al. 2011) (Tab. and Fig. 1).

Since it was not possible to establish the frequencies of figurative motifs from some PAVF, SMLA, and CB-LS sites, a presence-absence table was used to establish the relative abundance of types of figurative motifs by region (Tab. 2). These proportions are calculated based on the number of sites, the type of representation present, and the total number of sites with rock art in the area (Charlin, Borrero 2012).

### Results

#### Relative abundance and spatial distribution of figurative motifs in the extreme south of southern Patagonia

Regarding the sites with figurative representations according to each region, the figurative percentages, in terms of relative abundance or proportion, show

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of rock art sites</th>
<th>Number of sites with figurative motifs</th>
<th>Number of sites without figurative motifs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>PAVF</td>
<td>73</td>
<td>100</td>
<td>44</td>
</tr>
<tr>
<td>CB-LS</td>
<td>13</td>
<td>100</td>
<td>5</td>
</tr>
<tr>
<td>SMLA</td>
<td>18</td>
<td>100</td>
<td>11</td>
</tr>
<tr>
<td>ZM</td>
<td>1</td>
<td>100</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>105</td>
<td>100</td>
<td>61</td>
</tr>
</tbody>
</table>

**Tab. 1. Regions with figurative rock representations in the extreme south of Patagonia compared on a macro-regional scale.**
that the results obtained for SMLA (61.11%) and PAVF (60.27%) are extremely similar, although they differ in absolute terms since the PAVF has three times more sites (n=44) than the SMLA (n=11). Regarding the PAVF, the interfluve of the Gallegos-Chico rivers turns out to be the space with the most significant number of sites that record figurative representations (n=21), followed by the Chico River basin (n=13) and the Gallegos River basin (n=8). Finally, the number drops to two sites with a figurative presence in the areas surrounding the PAVF (Laguna Blanca, Chile). On the other hand, in the spaces with rock representations located in the CB-LS locality, 38.46% of them have figurative motifs (Fig. 1 and Tab. 1). In the ZM, only one site was registered, and it meets both categories, being a small sample to identify possible trends.

Regarding the relationship between the number of sites with figurative representations and the category of figurative represented, in the PAVF, the three-digits paintings and engravings are present in 52.27% of the sites, followed by zoomorphic paintings and engravings at 31.82%, and the anthropomorphs are in third place (27.27%). The positive and negative hands in total represent 31.82%. Lastly, only one site (MBV-EBV) found with positive fingers (Tab. 2). In the CB-LS locality, anthropomorphs and zoomorphs are found in more than half of the sites with figurative representations (60%), followed by three-digits (40%) and, finally, hand negatives (20%). Similarly, in the SMLA the most frequently captured figurative categories are anthropomorphs (45.45%) and zoomorphs (45.45%). The positive and negative hands follow in order of abundance (18.18%), with the three-digits being the least represented (9.09%).

Sample composition

**Anthropomorphs**

In the PAVF and nearby sites, there are 24 painted motifs and one engraved motif corresponding to schematized human figures (Fig. 2). The painted motifs were executed through linear and flat treatment; they are presented in frontal perspective with a rounded head, elongated body, and differentiated legs and arms. The dimensions of these representations are generally between 14cm long by 13cm wide. In the middle basin of the Gallegos River, the Puesto Cañadón Verde 1 and 2 (PCV) sites record three anthropomorphs in red made using the flat technique (Manzi, Carballo Marina 2012). On the other hand, the PCV2 anthropomorph presents limbs with curvilinear lines. In the interfluve of the Gallegos-Chico rivers, the Puesto El Cóndor (PEC) site has a red anthropomorphic product of recording a three-digits. This motif resembles the human figure recorded at the Madre de Dios site in the Última Esperanza (UE) archipelago (Muñoz 2020). However, this motif was made using the punctiform technique, while in PEC, the linear technique was used. Otherwise, at the Meseta Bella Vista-Estancia La Carlota (MBV-ELC) site, there are four anthropomorphs in reddish tones, where two of them were made using the linear technique, and the rest present a flat treatment (Manzi et al. 2019). Besides, in the Potrok Aike Lagoon (LPA), Julieta Gómez Otero (1983–1985) recorded three anthropomorphic motifs in red, one below a zoomorphic like a guanaco. According to the author, the other two anthropomorphic motifs have headdresses similar to the human figure from the Lago Roca III site located in the Lago Argentino area. Another anthropomorph with a headdress is found in the MBV-ELC-La Sixtina, whose motif corresponds to a schematic human figure made with linear treatment, where one lower extremity presents the shape of a three-digits and the other four strokes, the dimensions of this figure reach 119cm long by 73cm wide (Manzi et al. 2019).

In the Chico River, the Markatch Aike 7B site presents a single human figure with linear technical treatment in red (Hernández Llosas et al. 1999; Molina 1972). The human figure is ‘framed by four ‘cruciform’ three of which, those facing up, seem to correspond to schematized three-digits” (Hernández Llosas 1992.12). In the Chilean steppe sector, the Río Chico 1 and 2 (RCh) sites contain seven red-coloured anthropomorphs with linear and flat technical treatment; they were also recorded in red in Cañadón

![Tab. 2. Relative abundance of figurative motifs by region in southern Patagonia.](image-url)
Seco 1 (n=2) (*Bate 1971*). The Ush Aike (Oois Aike) site presents four anthropomorphs, three in red and one in white, being the only one in that colour within this motif category in the entire PAVF (*Bate 1970; Gallardo 2009; Molina 1972*). To the south, at the Cañadón Leona 3 site, Bate (*1970*) identified abundant schematized anthropomorphic figures in red, black, and sometimes red bordered with black, made with the flat technique. The average size of these motifs is around 10cm, although some figures reach 20cm. Charlin (*2014*) states that the Chico River sites have the most significant number of painted anthropomorphic motifs. In this framework, the Gallegos River basin has the lowest frequency. Regarding the anthropomorphic engravings in the area, only one human figure with probable attire has been detected at the Lamasuario 1 site (interfluve of the Gallegos-Chico rivers) made using the scraping technique (*Manzi et al. 2022*).

The CB-LS locality has three sites where painted anthropomorphic motifs have been found. In the second report from 1971, Bate notes the presence of anthropomorphs in reddish tones at the Laguna Sofia 1 and Lago Sarmiento 1 and 2 sites, although he does not specify the number of motifs. In Lake Sarmiento 1, anthropomorphs were found almost exclusively, reaching a larger size and with a broader line. Sometimes the inner surface is full of colour (*Bate 1971*).

With regard to the SMLA, the frequencies of the motifs have not been published, which is minimum numbers are used. In this context, anthropomorphs and zoomorphs constitute the most represented figurative motif. They were detected in reddish tones in Punta Walichu (*Moreno 1969 [1876–1877]*) and Chorrillo Malo 1, 6, and 7 (*Belardi et al. 1994; Franco et al. 1999*). Specifically, in Chorrillo Malo 1, there is a scene of schematic anthropomorphs in a dynamic attitude (*Belardi et al. 2000.292*). On this point, Belardi *et al.* indicate that “the design of the figures has been used, which go from largest to smallest, and their position to indicate depth of field” (*Belardi et al. 1999.10*). At the same time, the possibility of motifs being repainted is indicated for one of the anthropomorphic motifs from the Chorrillo Malo 6 site (*Belardi et al. 2000*). Likewise, they are present in the Lago Roca 2 site in red, where they form a unit of meaning with the superimposed punctiform motifs (*Belardi et al. 1999*). On the other hand, Manuel J. Molina (*1972*) surveyed an open-air wall bordering the main cave of the Punta Walichu site, where he recorded four human figures schematized in red of considerable dimensions (between 18.5cm long by 30cm maximum width); it is also pointed out by Molina (*1972.83*) that an anthropomorph has three fingers.

Based on the above, there are various forms of representation in the anthropomorphic motifs of the extreme south of southern Patagonia. Firstly, in the PAVF, the bodies present variation in the torso (elongated, globular, triangular); also, in some cases, the arms are extended upwards and present differences in their shape. In only one case are fingers distinguished on the hand of an anthropomorph from the MBV-ELC site. In turn, it can be observed that one of the anthropomorphs of the MBV-ELC and PCV2 is arranged laterally. Regarding the colour and technical treatment, based on the available information, it is argued that the red colour and the flat technique predominate over the linear one, not having detected punctiform figurative motifs. Examples from the SMLA show perspective and dynamism in the human figures, while those from the PAVF confirmed the presence of cephalic headdresses, recycled motifs, and a figure with a phallus. However, this last characteristic could be interpreted as a tail, as proposed by

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**Fig 2.** a Anthropomorphs from the Pali Aike volcanic field (the tracings of Cueva La Leona, Río Chico 1 and Ush Aike were taken from Bate 1970); b and c anthropomorphs from the southern margin of Lago Argentino (the tracks are published in Belardi *et al.* 1994 and Menghin 1952).
Rodolfo M. Casamiquela (1981, 37) for the anthropomorphic motifs of Punta Walichu. Thus, an additional difference between the PAVF and the SMLA (Chorrillo Malo and Punta Walichu) is that the anthropomorphs are represented in isolation in the former. In contrast, on Lake Argentino’s southern shore, they are represented in scenes. This factor also influences the representation of postural differences.

**Hands**

In the case of PAVF hand negatives, they are only found in six locations. In the Gallegos River basin, the Abrigo Pintado de Güer Aike (APGA) (n=2) and PCV2 (n=1) sites present red hand negatives (Manzi et al. 2010; Molina 1972). In the Gallegos-Chico interfluve, the EBV-ELC site records a hand opposing in white (Manzi et al. 2019), while in the caves near Cueva de los Contrahandinastas, the negative corresponds to red (Prieto et al. 1989–1990). Four white hand negatives were recorded at the Bajo El Cóndor 2 (BEC) site. Finally, to the south, they appear only in white in Río Chico 5 and Ush Aike (Bate 1971; Gallardo 2009; Molina 1972).

In CB-LS, the only site that presents hand negatives is Sitio Lago Sarmiento 1, although the exact number of these motifs is unknown. The negatives were executed in yellowish-white and are superimposed on the anthropomorphic and zoomorphic ones (Bate 1971). On the other hand, the SMLA records a high frequency of red hand negatives in Punta Walichu (Moreno 1969) and Punta Bonita 2 (Belardi 2003; Carballo Marina et al. 1999).

Unlike the negatives, the hand positives are more abundant in the PAVF. In the Río Gallegos basin, the APGA site is the only one that presents black hand positives (n=2). Another northern PAVF site is Alero de los Pescadores (ADLP), where two positives were recorded in red (Molina 1972). However, the most significant number of positives for hands is found in the Gallegos-Chico interfluve, with the Meseta Bella Vista-Estancia La Carlota (MBV-ELC) being the space with the highest frequency (n=16). In this regard, 13 positives are painted red, while three are executed in white (Manzi et al. 2019). The Bella Vista Plateau-Estancia Bella Vista (MBV-EBV) also has hand positives (n=6), most of which are red except for one motif in white (Manzi et al. 2019). Another interfluvial site with this type of representation is Alero del Artista (sensu Manzi et al. 2015, Site 1 sensu Charlin 2014), registering a single positive in red. Finally, in the southern PAVF area, a red hand positive was detected at the Rose Aike 3 site in association with a series of long parallel tracks (Massone 1982). Regarding finger positives, they have been found in MBV-EBV (n=6).

This figurative was not found in the literature in the CB-LS locality. On the other hand, in the Lago Argentino area, examples were recorded in Punta Walichu (Moreno 1969) and Chorrillo Malo 5 (Belardi 2003; Belardi et al. 1994).

**Three-digits (bird tracks)**

Three-digits are present in most of the sites recorded in the Gallegos River basin (n=6) (Molina 1969). The APGA site records three red three-digits (Molina 1972), while Güer Aike’s Alero 1 has two in red tones (Manzi, Carballo Marina 2012). Likewise, the Alero Romario Barria (ARB) site has five three-digits, one executed in white and the rest in red (Campan et al. 2007). Two of the three-digits motifs are found below vertical parallel compound strokes at this site (Manzi, Carballo Marina 2012). On the other hand, PCV1 (n=4), PCV2 (n=3), and PCV4 (n=1) have three digits in red (Manzi et al. 2010). In PCV1, a compound three-digits was detected above an isolated three-digits and a spot (Manzi, Carballo Marina 2012).

Regarding the interfluve of the Gallegos-Chico rivers, in MBV-ELC, the three-digits (n=6) were made in red (n=4), black (n=1), and white (n=1) colours (Manzi et al. 2019). These motifs were also revealed in Potrok Aike by Gómez Otero (1983–1985). On the other hand, Puesto El Cóndor (PEC) is the location with the most significant number of this figurative in the PAVF (n=13), all executed in red (Manzi et al. 2010). They were also detected in reddish tones in Bajo El Cóndor (n=2) and Alero del Artista (n=2) (Charlin 2014; Manzi et al. 2015). Finally, and similarly, in the Chico River area there are many sites that present this figurative. The Markatch Aike site has a total of nine red three-digits (Hernández Llosas 1992). Likewise, in Rose Aike 3, three were recorded in red tones (Massone 1982). Exceptionally, Site 6-Cave 5 (S6.C5, Ea. Pali Aike) has two white three-digits; the three-digits are above abstract motifs in deep red (Hernández Llosas et al. 1999). Three-digits were also detected in Laguna Sota 1 (Massone 1982) and the Cañadón Leona 3 site in black (Bate 1970).

Concerning the engraved three-digits in the PAVF, they are present in the interfluve of the Gallegos-Chico rivers, where they were made using three tech-
niques: incision, abrasion, and polishing, as well as combinations of these. The morphology of the three-digits varies according to the way of incising and the instrument used, generating a U- or V-shaped stroke. The Bajo El Cóndor 3 (BEC3) site records the most significant number of this type of figurative (n=16), where abrasion, polishing, and abrasion-polishing techniques were used (Manzi et al. 2015). They were also recorded in BEC1 (n=8), BEC2 (n=3), and Campo El Cinco, block 1 (n=1) (Manzi et al. 2015).

Three-digits are the only type of figurative motif present in the Zona de los Morros and are found at the Morro Chico site (Bate 1970). There, the low number of motifs detected is noted, which coincides with the low archaeological signal from the area (Charlin et al. 2011). The three-digits were painted in red, and one was recorded for each panel (a and b) (Bate 1970).

In CB-LS, two sites present this type of motif: Laguna Sofía site and Lago Sarmiento 2, both surveyed by Bate (1971). These motifs were made in reddish tones. Unfortunately, there are minimal numbers since the frequency of rock representations has not been published. On the other hand, according to the consulted bibliography, in the SMLA only three-digits are found at the Chorrillo Malo 7 site, executed in red (Carballo Marina et al. 1999; Belardi et al. 2000).

There is a great variety in the representation of these motifs (Fig. 3). In this regard, the convergence of the angles varies; the contours can appear in ‘U’ or ‘V’, the vertex can be oriented upwards or downwards, the thickness of the line also varies, and sometimes the succession of several three-digits whose structure and/or overlap make up a trail, as can be seen at the Alero 1 site of Güer Aike. Likewise, the three-digits appear in the PAVF associated with abstract and figurative motifs.

**Zoomorphs**

The painted zoomorphs in the PAVF were all executed in red tones and using the linear technique. They are found in five sites: PCV1 (n=1), PEC (n=2), LPA (n=2), and Río Chico 2 (RCh2) (n=1) (Bate 1971; Campan et al. 2007; Manzi et al. 2010; 2012; 2015; 2019). In the PCV1 and PEC sites, the zoomorphic motifs correspond to matuastos (sensu Schobinger, Gradin 1985). In the case of the RCh2 site, Bate (1971) does not specify which animal the motif corresponds to in his second report. Otherwise, in the LPA, Gómez Otero (1983–1985) pointed out the presence of a matuasto in a light red colour; above the motif, an isosceles triangle was made, also in a red.

In the CB-LS area, the zoomorphic motifs were painted red and made from dots. They are located at Lago Sofía 2, Cerro Benítez 2 (n=1), and Lago Sarmiento 1 (n=2) (Bate 1971; Massone 1982). In this last site, Bate (1971) pointed out that these motifs are in articulation with anthropomorphs and could be felines. On the other hand, in Cerro Benítez 2, it is indicated that the zoomorphic motif is complemented by a series of parallel strokes, strokes cut at right angles, and curved lines (Massone 1982). As for the SMLA, zoomorphs are present in considerable numbers. First, at the Chorrillo Malo 1 site, red schematic matuastos (Pristidactylus scapulatus) were detected (Belardi et al. 1999). Likewise, in Chorrillo Malo 6, “a possible matuasto” was found in two red tones (Belardi et al. 2000. 294). On the other hand, they have been detected in Lago Roca 1, 2, and 3 (Belardi 2003). The zoomorphs of Lago Roca 1 and 3 correspond to naturalistic guanacos, while the animal motifs of Lago Roca 2 refer to schematic matuastos (Belardi et al. 1999; Belardi 2003).

Zoomorphic engravings make up a class of designs that do not correspond to those recognized within the so-called Río Chico Style and its regional variations, nor to its modalities or substyles (sensu Bate 1970; 1971; Massone 1982). The engravings represent camelids and are only present in the PAVF (Prov. Santa Cruz), specifically in the locations Lamasaurios I to X in Meseta Bella Vista-Estancia la Carlota, Campo

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**Fig. 3. Three-digits of the Pali Aike volcanic field.**
El Cinco, and Barra del Molino. In total, 64 full-body guanaco motifs and 13 motifs correspond to anatomical parts of camelids, specifically the necks and hind/front quarters (Manzi et al. 2022) (Fig. 4).

**Discussion and final considerations**

From the execution of graphic representations such as rock art, the hunter-gatherer populations that inhabited the extreme south of southern Patagonia modified their environment. In this framework, due to their obtrusiveness in the landscape, these manifestations could have acted as milestones that guided the circulation of human populations (Belardi et al. 2020; Borrero et al. 2011).

Based on the results obtained in this study, it is highlighted that although the figurative representations decrease in variety and frequency as one advances through Patagonia and toward the Strait of Magellan (Gallardo et al. 2022), the new investigations in the PAVF indicate that the figurative motifs have great ubiquity in the sites of the last space of the continental sector, presenting a more significant variability and an increase in the number of figuratives than previously documented (Fig. 5). In the PAVF, the most frequently executed figurative category is the three-digits, both painted and engraved. In this sense, it is noted that the ability of rock representations to transmit information can be evaluated through the standardization of their motifs. This implies reproducing characteristics such as the motifs’ shape, size, and colour on different supports. The visual uniformity of this structure allows its visual encoding and decoding, which facilitates the transmission of information (Fiore 2006; 2011). The codes associated

*Fig. 4. Engravings of camelids registered at Lamasaurios sites.*
with this motif were thus widely adopted and appropriated by the hunter-gatherer groups that inhabited the area (Wobst 1977; Barton et al. 1994). In this sense, the presence of three-digits assigned to the Rio Chico Style in Morro Philippi (Ortiz Troncoso 1973) suggests that this sector would have formed part of the broader range of action of the population node settled in the PAVF (Charlin et al. 2011).

The second category mainly reflected in the PAVF is zoomorphs, especially those executed using engraving. On the other hand, in the CB-LS locality and the SMLA painted anthropomorphs and zoomorphs are the most frequently executed rock art representations (Charlin, Borrero 2012). The schematization of painted zoomorphic and anthropomorphic motifs is a feature shared between the PAVF and CB-LS (Bate 1970; 1971). Exceptionally, naturalist zoomorphs have been reported at the Lago Roca 1 and 3 sites in the SMLA. With regard to the presence and/or absence of certain figurative motifs, it has not been possible to trace the positive category of fingers in the available bibliography for the locality CB-LS and the SMLA.

In addition, the finding of recorded engraved camelids in the PAVF marks a precedent for rock art representations in the extreme south for which there was no record in this area of Patagonia. Based on morphological comparisons with similar designs, these motifs could evidence the flow of information between the human groups of the PAVF and those found in the Strobel plateau, the north bank of the Santa Cruz River, the central plateau, and the river area Pinturas (Gradin et al. 1979, Garden 2008, Fiore, Ocampo 2009, Manzi et al. 2019, 2022, Re 2010, 2017). At the macroregional level, given the morphological similarities with designs identified in different southern and central/southern Patagonia sectors, these representations could be assignable to the middle Holocene (Manzi et al. 2019, 2022).

With regard to the technical treatment of the painted motifs, the anthropomorphs of the PAVF have been executed using flat and linear techniques with a predominance of the latter. Similarly, in CB-LS, both techniques were used to execute these motifs with a predominance of the linear technique over the flat one (Muñoz 2020). In the case of the painted zoomorphs, the technical treatment used in the PAVF has been linear, unlike CB-LS, where they were executed using the punctiform technique. Besides, the three-digits were made by linear technical treatment, where in some cases the curvilinear line can be distinguished from the straight line. For their part, figurative engravings have only been found in the PAVF, and the available information indicates that a wide variety of techniques were used (incision, scraping, polishing, and combinations of these) (Manzi et al. 2019, 2022). In short, it is highlighted that the main difference between the Rio Chico and Lago Sofia modalities applies to the figurative motifs based on points as distinct from those made using the flat and/or linear technique.

In the case of the colours used, most of these motifs were painted in reddish tones, with less presence of black, white, and bichrome tones (Bate 1970, 1971; Sepúlveda 2011, Charlin et al. 2023b). In the case of
the PAVF, this coincides with the geochemical results, where the abundant local availability of hematite in the primary outcrops was confirmed, as well as its low cost of obtaining it, either from the altered vesicular basalt or as a saprolite buried a little depth (Charlin et al. 2023b).

Regarding superimpositions related to painted figurative motifs, in PAVF they are found in three sites (ARB, LPA, and S6.C5), while in CB-LS they are present in sites LS1 and LS2. On the other hand, superimpositions were documented in Punta Walichu (SMLA). In summary, however, due to their low number it can currently be said that superimpositions are uncommon in the rock art of the extreme south of southern Patagonia.

Meanwhile, in CB-LS, the age of the paintings assigned to the Lago Sofía modality could be 2870±65 years BP, according to the dating obtained for the Cerro Benítez 2 (Dos Herraduras) site (Masone 1982). In the case of the PAVF, Manzi, and co-authors (2019) differentiate three temporal segments: the first comprises camelid engravings whose temporal depth could go back to approximately 5000 years BP according to macroregional morphological comparisons. These first rock art manifestations of the PAVF would be linked to specific moments in which the space was occupied (sensu Borrero 1994–1995). Furthermore, the representations of engraved camelids, similar to the painted motifs in other areas of Patagonia, allow us to envisage communication on a larger scale and a greater temporal depth than is commonly assumed for PAVF rock art.

The second segment (Manzi et al. 2019) would be made up of the so-called Río Chico Style (sensu Bate 1970; 1971), assignable to the late Holocene, considering the few available datings of layer pigments (Bate 1970; Gómez Otero 1989–1990; Prieto et al. 1998). As a result, it can be observed that two repertoires of rock art ensembles were executed in the PAVF, and the first would include the camelids as part of the oldest representations of the study area. These motifs would represent a colonization stage (sensu Borrero 1989–1990) that would have begun in the middle Holocene and indicates the possible connection with groups of humans from central-southern Patagonia (Manzi et al. 2019, 2022). On the other hand, a second figurative pattern is identified that would be framed within the so-called Río Chico Style. These representations, whose execution is probably later, could be related to a stage of effective occupation (sensu Borrero 1989–1990; 1999). Notably, the number of sites with rock art for the late Holocene is decidedly higher (n=63) than those that would correspond to the middle Holocene (n=10).

Although the Río Chico Style has been assigned to the late Holocene, the temporality of the abstract and figurative motifs that make up this group have been the subject of debate by the various researchers who have worked in the area. This is because specific motifs have been executed over time, and some are shared by various ‘styles’ (sensu Menghin 1957). In this regard, Molina (1969) maintained that “the footprint style” (sensu Menghin 1957) together with the radiated concentric circles, are relatively modern for PAVF rock art. However, these motifs have been attributed to different moments in time and generally to the last c. 4000 BP (Lasheras Corruchaga, Fatás Monforte 2015). On the other hand, Molina (1969) raised the possibility that the oldest representations of the PAVF correspond to the Negative Style of Hands detected in the Güer Aike Painted Coat.

Regarding the Negative Style of Hands, Osvaldo Menghin (1957) argued that a set of simple geometric symbols had probably been combined from the beginning with the representations of hands. Given this, it would be prudent not to assign them to a temporal block since the hand negatives are present at different times throughout the entire stylistic sequence of the Pinturas River area, representing Stylistic Groups A–E (Gradin et al. 1979), and the archaeological record of this area continues to be used as a basis for the interpretation of the stylistic sequences of other sectors of Patagonia. Furthermore, some hand negatives date from relatively recent times (c. 520 BP) in Viuda Quenzana (Santa Cruz) (Brooks et al. 2018). Therefore, they may not necessarily be part of the Río Chico Style. The last segment would include large painted motifs (varying between 10 and 119cm), such as three-digits in red and anthropomorphs with possible cephalic headdresses (Gómez Otero 1983–1985), and sexual features associated with fretwork motifs (Manzi et al. 2019) that could be assigned to historical moments (c. 500 BP) (Belardi 2004). In this regard, Bate (1971) pointed out that the Lago Sarmiento modality would include large-sized anthropomorphs and zoomorphs. However, there are no dates to draw a parallel with the representations of considerable size present in the PAVF.
Based on this, even though the low number of painted sites and the lack of regionalization in the rock representations of southern Patagonia has been pointed out (Carden 2008; Fiore 2006), this study highlights an increase in diversity and frequency of painted and engraved figurative motifs, according to research carried out in recent years in the Pali Aike volcanic field. In addition, it is stated that the type and flow of information transmitted through rock art have undergone formal modifications over time, with two different rock art assemblages in the PAVF, accounting for different regional occupational processes (Aschero 2000; Borrero 1994–1995). Finally, the classes of rock representations are not the same at a macro-regional scale, although it is evident that the absence of significant regionalization in the rock repertoires seems to indicate an open network of information flow between the populations that occupied the eastern steppe (PAVF) and the forest-steppe ecotones (ZM, CB-LS, and SMLA).

Future work will assess whether these changes in rock art occurred due to population replacements and/or divergences (Charlin 2020). To this end, the information provided by the other lines of evidence studied in these regions will be included in the discussion, with particular emphasis on sensitive indicators of human mobility.

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