

A QUANTITATIVE APPROACH TO UR III MESOPOTAMIAN FIGURATIVE LANGUAGES: REFLECTIONS, RESULTS, AND NEW PROPOSALS

1. INTRODUCTION

The study of cylinder seals gives a privileged perspective on Mesopotamian pre-classical historical societies: indeed, it provides a view on the administrative, political, craftsmanship, and artistic cultural developments of this region.

In this article, as well as in some past experimental works (DI LUDOVICO 2005, 2012), two issues have been preliminarily considered, in order to carry out a global interpretation of phenomena related to the Ur III period glyptic production. A first one is related to their shape. The laboratory impressions we are familiar with should rather be considered the way deeply literate cultures use to observe and describe by abstraction ancient artifacts that are provided with engraved representation. Such an attitude largely forecloses an approach to the complex combination of the represented features with their cyclical surface.

A second issue concerns the definitions and the terminology adopted. The scenes that were examined in this study have been outlined as an iconographic subject of Ur III glyptic long time ago, but no definition of this subject has been unanimously accepted by the scholars (DI LUDOVICO 2005, 60-68).

2. THE METHODS

For our purposes, Textual Analysis (that is, the use of quantitative techniques: LEBART, SALEM 1988, 1994) was applied on the formal texts that interface the seals of the *corpus* at hand with the analysis methods. Indeed, it was already used in a similar *corpus* of Uruk/Jamdat Nasr seals by ROVA (1994) and CAMIZ and ROVA (2001, 2003) to partition the *corpus* into homogeneous classes in respect to the iconographic elements, that were found significantly tied to some external characters, such as function, site of origin, etc.

Both *exploratory* and *confirmatory* data analysis techniques can be used for such a purpose (see CAMIZ 2001, 2004, 2011), but the exploratory are more suitable for archaeological data (see BAXTER 1994, for this specific use), since they very seldom comply with the requirements to apply confirmatory ones (CAMIZ 2004). Indeed, we limited the use of statistical tests only to make some provisional choices concerning the results obtained from the exploratory analyses.

The aim of our study is twin: on one side to partition the *corpus* according to the iconographic composition and on the other to characterize both Sites and Periods according to it. The study was performed in three steps: in the first one, we searched some orders of the seals, based on the different composition as it may be described by the formal text created for this purpose. In the second step, we tried to partition the *corpus* into classes of homogeneous seals, at most distinguishing those of different classes. Eventually, we characterized the classes through the compositional elements most frequent (or most rare) in each class in respect to their distribution within the whole *corpus*. Thus, according to the aim, we can call these phases *ordination*, *classification*, and *structure interpretation*. In this work we took advantage of these techniques to perform only an Exploratory Textual Analysis (ETA: LEBART, SALEM 1988, 1994), since forcing the methods actual abilities for statistical inference would be a misuse (see CAMIZ 1991 for a discussion). As in the quoted works of Rova and Camiz and Rova, once described each image of the *corpus* of seals through a formalized text, we could apply the ETA on the *lexical table*, i.e. the contingency table that crosses these texts with the *lexical forms* used to describe the seal's image.

The adopted ETA procedure consists in the Textual Correspondence Analysis (TCA: LEBART, SALEM 1988, 1994), that is Correspondence Analysis (CA: BENZÉCRI 1973-1982; GREENACRE 1983; LEBART, MORINEAU, PIRON 1995) applied to these tables to obtain a reduced dimensional representation on ordination axes. Here the proximity among either seals or forms is interpreted as either similar profiles of forms in the seals, thus a similarity of the described images, or similar presence of forms in the seals, that may contribute to compose repeated sub-images. A special mention should be devoted to the use of *supplementary elements* in CA, in our case the levels of other nominal characters, such as site, dating, etc. They were merely projected on the extracted factor spaces according to the relations they have with all other elements. Usually, they reveal useful for factors interpretation through exogenous characters (i.e., the supplementary ones).

Once chosen a suitable number of factors, we applied a Hierarchical Ascendant Classification (HAC: ANDERBERG 1973; BENZÉCRI 1973-1982; LEBART, MORINEAU, PIRON 1995; GORDON 1999), based on the Euclidean distance on the selected factor space of TCA and using the WARD's (1963) criterion to aggregate the classes.

For each class of the partition and each level of the nominal characters, we selected the *characteristic lexical forms* and *typical images*. The characteristic forms are those whose frequency is significantly larger or smaller in a class than the overall one in the *corpus*. The significance of forms was checked via a hypergeometric distribution (with threshold 5 or 1%, but only to select them and sort according to the associated probability), and the typical images



Fig. 1 – Coding strategy. Location of the receiver (R) and the origin on two presentation scenes (BM 129492 and BM 103232, COLLON 1982, nos. 397 and 440).

are those that are represented closest to the centroid of the class of belonging in the factor space, as they are supposed to be featured with the characteristic elements of the class.

As we were interested in understanding to what extent special relations existed between forms (that is, some particular iconographic feature) and either origin or period, we applied TCA also to the reduced tables that sum up the entries of the seals with either the same provenance or the belonging to the same period.

3. CRITERIA FOR THE SCENES' CODING

In order to carry out a TCA, a data set collecting a proper coding of the scenes has been built (similar codings were well illustrated in CAMIZ, ROVA 2001, 16-21). The scenes' coding is founded on two main topological reference points: the figure of the receiver and the origin (i.e. the region of the cylinder where the scene begins and ends) of each specimen (Fig. 1: the relevant logics and issues have been explained in DI LUDOVICO 2005, 2012). In every scene some main compositional elements were located and singled out as corresponding primarily to anthropomorphic figures or groups of integrating elements. The expression *integrating elements* is used here to indicate a large variety of objects, domesticated or wild animals, heraldic-like compositions, monsters, plants, and similar. A textual coding was then used to describe the scenes as a whole, following a well definite order. The example displayed here (Fig. 2) shows the whole scene enclosed in parentheses: within them, groups of components of the scene that have some kind of relations between each other are enclosed in parentheses too.

Each character represented in the scene is described according to the following order: nature and gender, clothing, headgear, hairstyle, orientation, position of each arm, physical attributes, objects-attributes (Fig. 3). Any integrating element is described with a category of belonging, a code meaning

Buchanan 1981, n. 631, p. 238, YBC 9665



Coding

((Un uomo mantello a_frange acconciatura a_c orientato a_destra mano_destra davanti_al_volto mano_sinistra) tiene_per_mano (una dea veste a_balze tiara t_c4 acconciatura a_n1 orientato a_destra mano_sinistra davanti_al_volto ha g4 g3)) ((astro I in_alto) sta_sopra (animale u6 in_centro)) ((un uomo mantello a_frange tiara t_cl orientato a_sinistra mano_sinistra alla_vita mano_destra in_avanti ha f8) assiso su (trono H4 podio_1)) (iscrizione due_caselle contenuto_d)

Part of the scene Specific description

```
(
  (
    (
      character      un uomo [a man]
      clothing       mantello [mantle]
      type           a_frange [fringed]
      hairstyle      acconciatura [hairstyle]
      type of hairst. a_c [type c]
      orientation    orientato [oriented]
      direction      a_destra [right]
      right hand     mano_destra [right hand]
      position       davanti_al_volto
                    [before his face]
      left hand      mano_sinistra [left hand]
      position       [implicit in the
                    following description of relation]
    )
    relation        tiene_per_mano [holds by the hand]
  )
  (
    character      una dea [a goddess]
    clothing       veste [robe]
    type of robe    a_balze [flounced]
    headgear       tiara [crown]
    type of headg. t_c4 [type c4]
    hairstyle      acconciatura [hairstyle]
    type of hairst. a_n1 [type n1]
    orientation    orientato [oriented]
    direction      a_destra [right]
    left hand      mano_sinistra [left hand]
  )
)
```

```

position          davanti_al_volto
                  [before her face]
[right hand position is implicit in the relation
above described]
attributes        ha [has]
type of attr.     g3 g4 [types g3 & g4]
)
)
(
  (
    integr. element astro [astral symbol]
    type of element I [moon sickle]
    position in the field in_alto [top]
  )
  relation        sta_sopra [placed above]
  (
    integr. element animale ["domesticated"
                             animal]
    type of element u6 [goose]
    position in the field in_centro [middle]
  )
)
)
(
  (
    character      un uomo [a man]
    clothing       mantello [mantle]
    type           a_frange [fringed]
    headgear       tiara [crown]
    type of headg. t_cl [type cl]
    orientation    orientato [oriented]
    direction      a_sinistra [left]
    left hand      mano_sinistra [left hand]
    position       alla_vita [by his
                             waist]
    right hand     mano_destra [right hand]
    position       in_avanti [forward]
    attributes     ha [has]
    type of attr.  f8 [type f8]
  )
  physical relation assiso su [sits on]
  (
    object         trono [throne]
    type           H4 [padded stool]
    further features podio_1 [simple dais]
  )
)
)
(
  legend          iscrizione [inscription]
  shape           due_caselle [two framed
                             lines]
  content         contenuto [content]
  type of cont.   _d ["PN1, son of
                    PN2"]
)
)
```

Fig. 2 – Example of coding. Scene from BUCHANAN 1981, no. 631, p. 238, YBC 9665; see Fig. 3 for the explanation of the codes adopted to express specific types of objects or motifs.








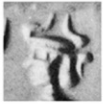



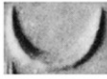











| | | | | | |
|---|---|---|---|---|--|
| Clothing |  |  |  | | Physical attribute  <i>beard (barbal)</i> |
| | <i>pleated robe</i> | <i>fringed mantle</i> | <i>plain robe</i> | | |
| | <hr/> | | | | |
| Hairstyle |  |  |  | | |
| | <i>a_n1</i> | <i>a_c</i> | <i>a_b1</i> | | |
| | <hr/> | | | | |
| Headgear |  |  |  |  | |
| | <i>t_cl</i> | <i>t_c5</i> | <i>t_cl</i> | <i>t_c4</i> | |
| | <hr/> | | | | |
| Integrating motifs: astral symbols |  |  | | | |
| | <i>l</i> | <i>l2</i> | | | |
| Integrating motifs: animals |  |  | | | Dais  <i>l+1b (simple dais and footstool)</i> |
| | <i>u7</i> | <i>u6</i> | | | |
| | <hr/> | | | | |
| Seat |  |  |  | | |
| | <i>H4</i> | <i>Q1b</i> | <i>Q8c</i> | | |
| | <hr/> | | | | |
| Object attribute |  |  |  |  | |
| | <i>g3 (multiple necklace)</i> | <i>g4 (double bracelet)</i> | <i>f6 (cup)</i> | <i>f8 (little amphora with handles)</i> | |

Fig. 3 – Adopted coding. Graphical explanation of the meaning of some coding mentioned in the text.

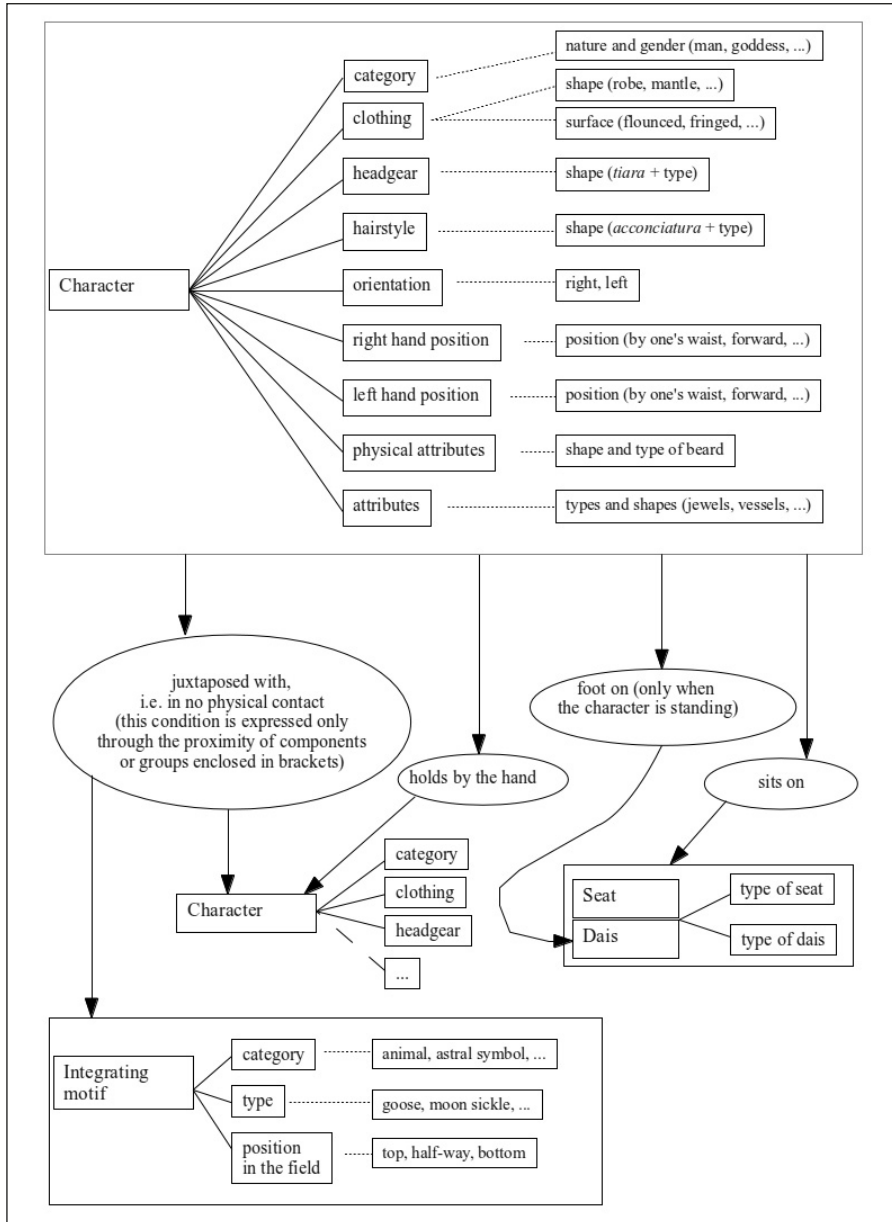


Fig. 4 – Coding strategy. Possible features and relations between the character and motifs, objects, or other characters represented in the scenes (arrows indicate the direction of relations, lines the possible genres or features, and dotted lines the relevant specific possibilities).

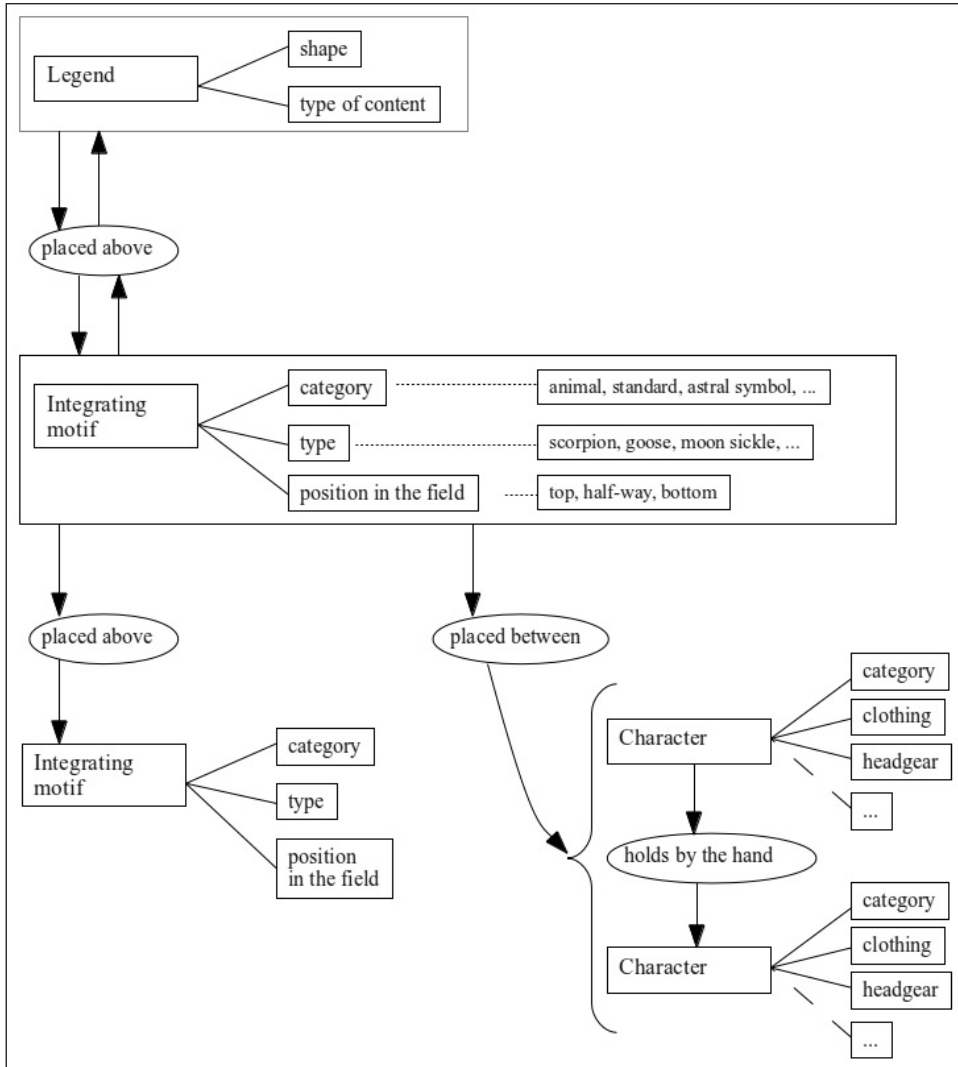


Fig. 5 – Coding strategy. Possible features and relations recorded in the data set and concerning the integrating motifs and the legends.

its specific kind or shape and its position in the field, while the seal legend is described for its shape and type of content. A full outline of all possible features and relations pertaining to the components of the scenes included in the data set is shown in Figs. 4-5, which also contribute to clarify the scenes' coding criteria.

4. THE DATA SET

The data set employed in this research collects 354 specimens of presentation scenes, of which 85 are known from ancient impressions and 269 from cylinders. A site of origin is known or can be inferred for 212 scenes, while only 88 of them provide clues for a quite precise dating (related to the year or the period of reign). Anyway, almost all scenes show such iconographic features that allow at least a general dating of their manufacture to one of three general sub-periods: the early Ur III period, the core of this age, its end (or beginning of the subsequent Isin-Larsa period).

General and specific dating of the seal has been included in the data set as external feature, when available, together with the place of origin. Neither indication of whether a scene is known from ancient impressions or from the cylinder, nor data on the physical dimension of the representation or the material of the relevant support have been recorded.

5. ANALYSIS ON THE SEALS-FORMS DATA

In the data table the 354 seals were described by texts that used 230 distinct lexical forms, summing up to 19,045 occurrences. In addition, 4 multilevel characters have been taken into account:

- the provenance (15 sites, N being the “unknown” site);
- the period (3: PA, meaning “early Ur III”, URIII, meaning “Ur III-core”, and PB, meaning “late Ur III”);
- the dating (39, N being the “unknown” date), and a hand-made grouping (27 compositional typologies).

To get the analysis more robust, we limited the attention to the 55 forms whose frequency was at least 3% of the total; this way, 175 forms, summarizing around only 7% of all occurrences, were withdrawn.

This reduced but sparse table did not show a significant chi-square, as it very often occurs with this kind of data, in particular due to the too high number of zeros. Nevertheless, the chi-squares associated to the first five factors resulted highly significant. Indeed, we limited attention only to the first three, since the associated correlation of the others was too low to allow to consider a relation between the factors seen by both seals and forms. This three-dimensional representation is able to describe around 43% of the total deviation from independence of seals and forms and ranges from over 22.5% of the first factor to around 9.7% of the third.

On the first factor there is an opposition between forms related to the male god (*un1*, *t_c5*, *barba1*), on the positive side, and others related to the goddess (*t_c1*, *una1*, *dea*), on the negative one. On the second factor, forms

that have to do with integrating motifs (especially animals) and the male human receiver are on the negative side, opposed to all others. On the third factor the opposition is between forms connected to the male god and a three lines legend (*dio, a_b1, t_c5, tre_caselle, c_2*) on the negative side, and others expressing features of the male human receiver and the animal integrating motifs (*H4, t_c1, belva, uomo, ...*), on the positive one. On these factors, let us consider the position of the two features site and period: for the latter, on the first axis, there is a significant opposition between PA (with PB) on the positive side and URIII on the negative one; on the second PB (positive) is opposed to PA (with URIII, negative). For the site, on the first axis, Umma and Eshunna (positive) are opposed to Tello, Ur, and N (negative); on the second the opposition between Umma (negative) and N (positive) is the only significant, whereas on the third, significant oppositions are between Susa, Abu-Habba, and N (positive) with Umma on the negative side.

The hierarchical classification showed interesting partitions in 4 and 9 groups. They are encapsulated and characterized as shown hereunder. Positive as well as negative deviations are here considered meaningful if they go over the 1% threshold:

– Class I (1/4) is composed by 150 scenes. Its most significantly present forms are: Tello, Ur (places of origin), N, URIII (datings); and most significantly absent: Umma, Susa (places of origin), PB, PA (datings). Both classes 1 and 2 of 9, encapsulated in class I (1/4), follow these trends, with few exceptions. The inner compactness of class I and the strong contribution to it by the large class 1 emerge in almost all cases. Their general tendency suggests a particular concentration here of scenes which show the hand in hand couple of standing goddess and man, before a receiving goddess. A number of forms expressing the position of integrating elements in the scenes, and especially the presence in them of animals, show negative deviations, while only two legend-related forms have positive ones: name and patronymic (*_d*) in two framed lines (*due_caselle*).

– Class II (2/4) is composed by 91 scenes. Its most significantly present forms are: Ur, N (places of origin), PB, N (datings), and most significantly absent: Umma (places of origin), PA, URIII (datings). In this class the three sub-classes 3, 4, and 5 of 9 are encapsulated. Class 5 often shows figures that are in contrast with the general tendency (it could be largely made of scenes with the receiving god). Forms related to gender, nature and posing of characters do not express a specific compositional structure.

– Class III (3/4) contains 47 scenes and coincides with class 6/9. Its most significantly present forms are: Umma (places of origin), PA (datings); and most significantly absent: N, Tello, Ur, Susa, N (places of origin), N (datings). The class shows quite clear cut deviations and seems to be basically populated

of scenes which show the male deity in the role of the receiver. Integrating motifs are usually few. The prevailing form of legend should be made of three framed lines and contains name, profession and patronymic of the seal owner. – Class IV (4/4) containing 66 scenes, whose most significantly present forms are: Umma, Susa (places of origin), PB, PA (datings); and most significantly absent: Tello, Ur, N (places of origin), UR III, N (datings). The encapsulated classes 7, 8, and 9/9 are noticeably different from each other. Most forms lead to think that the whole class IV can be centered on the presentation with the royal receiver. Such an impression is further confirmed by the trends of the deviations connected with the posture of the characters, clothing, physical attributes, and hairstyles.

6. ANALYSIS ON FORMS BY SITES-PERIOD

Crossing the 55 chosen forms with both the Place of origin and the Period, we got a $55 \times (15+3)$ contingency table that we submitted again to Correspondence Analysis. This time the total chi-square was highly significant, whereas the Malinvaud test (MALINVAUD 1987) showed as significant only the first axis. On the other side, the layers associated to the first three factors resulted significant according to Orłóci test (ORŁÓCI 1978), albeit with very weak canonical correlations. In the following we shall limit our comment to the first two axes, accounted for nearly 74% of the total deviation from expectation (around 60 and 14% respectively).

On the first axis, the opposition is evident between the periods PA (on the negative side) and UR III (positive), analogous to the opposition between Umma and Eshunna, on the negative side, and Ur, Tello, and N (unknown origin) on the positive one. On the second axis PB, on the negative side, is opposite to both the other periods: on its side Abu-Habba, Nippur, Subartu, and Eshunna are found, opposed to Tello on the positive side.

The relations between forms and places of origin is such that more than half of the latter are not associated to any scenes which show frequencies of forms that meaningfully deviate from the average of the data set. Deviations are here considered meaningful if they go over the 5% threshold. Sites that are associated to some meaningful deviations of the forms frequencies are Ur, Tello, Eshnunna, Susa, Umma, Dilmun, and unknown origin. Many of them are related to a quite large number of scenes, but Eshnunna only to four and Dilmun to two. This means that the number of related scenes has not necessarily an influence on the deviations of the forms from the average values. On the other hand, the sites which are not related to any meaningful deviations are Nippur, Babylon, Larsa, Uruk, Subartu, Drehem, Adab, Abu-Habba. The first three are respectively related to 6, 3, and 2 scenes; each of the others to one.

The deviations of forms related to Umma have a strong similarity with those of Eshnunna, while very different is the situation with the forms asso-

ciated with Ur, Tello, Susa, and N (unknown provenance), that, on the other hand, are all very similar to each other. In this perspective, one can point out remarkable differences especially between Umma, on one hand, and N, Ur, Susa, Tello, on the other hand.

It is important to observe that here Umma not only represents a geographic origin, but also a kind of use of the scene. In fact, all 75 specimens from Umma included in the data set have been recorded from seal impressions on administrative documents. The scenes related to other toponyms have been mostly known from cylinders.

The deviations that are associated with Umma impressions concern the presence of a male receiver, mainly divine, and, on the opposite end of the scene, a female deity. Hairstyle of the type b1 (*a_b1*), typical of the god, is connected to a positive deviation in Umma and a negative one in Susa and N. Hairstyle of the type n1 (*a_n1*) is typical of the goddess and shows a negative deviation with Umma.

The gender-related distinction between Umma and other sites is much more marked when one looks at the values recorded for forms like *un1/Un* (“a”, male), *una1/Una* (“a”, female), *dio* (god), *dea* (goddess). In all these cases, deviations clearly mark an opposition between Umma and other places like Ur, Tello and N. Such an opposition follows exactly the one suggested by the forms expressing the hairstyle, and is also mirrored by the values of the form *barba1* (beard).

Clothing-related forms do not show particular deviations, except for *piana* (plain robe), which has strong positive values at Dilmun, positive at Tello, and negative at Ur and Umma. Such clothing would not seem very compatible with the official context of administrative procedures.

Only scenes from Umma show deviations related to the posture of the characters: indeed, the position of the arms before the face (*davanti_al_volto*) and forward (*in_avanti*) is typical for this site.

Deviations link headgears to toponyms according to the following picture: *t_c1* (headgear with one pair of horns) is opposed to *t_c5* (headgear with multiple pairs of horns) and *t_cl* (skull-cap with thick brim), the latter two following almost the same trend. The first form has a positive deviation with Tello and N and negative with Umma; both the second and the third have positive deviations with Umma and negative with Tello (both), N (only *t_c5*) and Ur (only *t_cl*).

Deviations of the forms related to the seats of the receivers seem to be parallel to those of the headgears: the typical royal seat, *H4*, has positive deviations with Umma and negative ones with Tello and Ur; seat *Q1b* (square throne with a frame; see Fig. 3) is associated with a positive deviation with Ur and a negative one with Umma and Tello.

Integrating elements seem to be a further feature of distinction. On one hand, Umma and Eshnunna are associated with positive deviations of form *l2* (sun disk and moon sickle), which shows negative deviations with Tello and N. On the other hand, Umma shows negative deviations of the forms *l* (moon sickle) and *animale* (domesticated animal), both having positive deviations with N, as well as *belva* (wild animal).

This might also stress a qualitative difference between scenes with a single integrating element and those showing more than one. In fact, animals are often represented in scenes that have more than one integrating motif.

Deviations of forms related to legends seem to outline a general picture in which three-lines framed legends containing formulas of the kind “PN, professional title, son of PN” (connected to Umma) are opposed to two-lines framed legends of the kind “PN, son of PN” (Susa and N). The toponym of Ur shows peculiar negative deviations of the forms expressing the presence itself of a legend (*iscrizione* and *contenuto*).

7. FURTHER ANALYSES AND INTERPRETATION: ANALYSIS OF THE SCENES THROUGH THE FORMS

In the second part of this paper we will describe the further analytical processes and finally provide a general interpretative picture on the Ur III glyptic iconography based on the TCA investigations.

First, data related to the scenes have been crossed with those concerning the forms. As seen in the first part of this contribution, the hierarchical classification suggested to take into account two encapsulated partitions in 4 and 9 classes respectively (Fig. 6, top-left). Class 1 is very huge (not much less than a third of the whole data set) and its specimens densely take place in the lower left quadrant of the graphic; quite compact is also the distribution of the specimens of classes 2 and 3, though the latter covers a wider area. The prototypes figures (i.e., the figures which pertain to the first three most central specimens of each class) give analogous impressions, but also suggest that class 3 is made of two parts: a quite dense core in which about two thirds of its records find place, and a large peripheral area where the remaining third is scattered.

Classes 5 and 7 are quite widely scattered, but both keep a compact and numerous group of records (about half in class 5 and two thirds in class 7) at a middle-short distance from their centers. Definitely more scattered are specimens belonging to classes 4 and 8, both very poor. Specimens of class 6 are mostly distributed on a not very wide area, but are not very concentrated, and few more than 10% of this class is comparatively very far from the center. Much more concentrated are records of the poorer class 9.

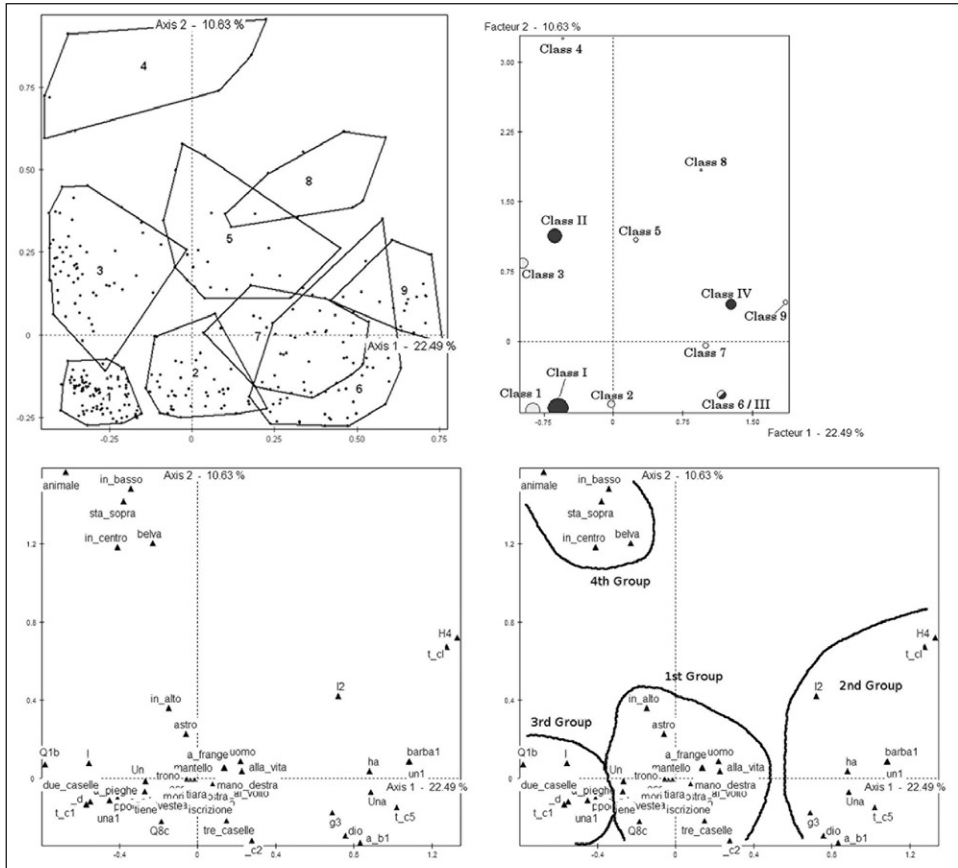


Fig. 6 – First analysis results. The 9 classes obtained (top-left); centroids pertaining to these classes and to the four classes into which they are encapsulated (top-right). Graphics showing the relations among the forms as they result from the first analysis and groups resulting from their interpretation (bottom).

The forms used to describe the scenes can be gathered, according to what is shown in the graphic (Fig. 6, bottom), into four main groups. A first one is located close to the origin; a second one is in the right side of the graphic, largely distributed around Axis 1 and partly above it; a third one lies opposed to the latter, along the same axis, but closer to the origin; a fourth group is placed very far from it, in the top-left region of the graphic.

A general view of the results gives the clear impression that quite a large number of features that have been used to describe the scenes are placed around the origin, in the first group. Due to their position, they should represent the basic universal features of the data set. Among them one finds

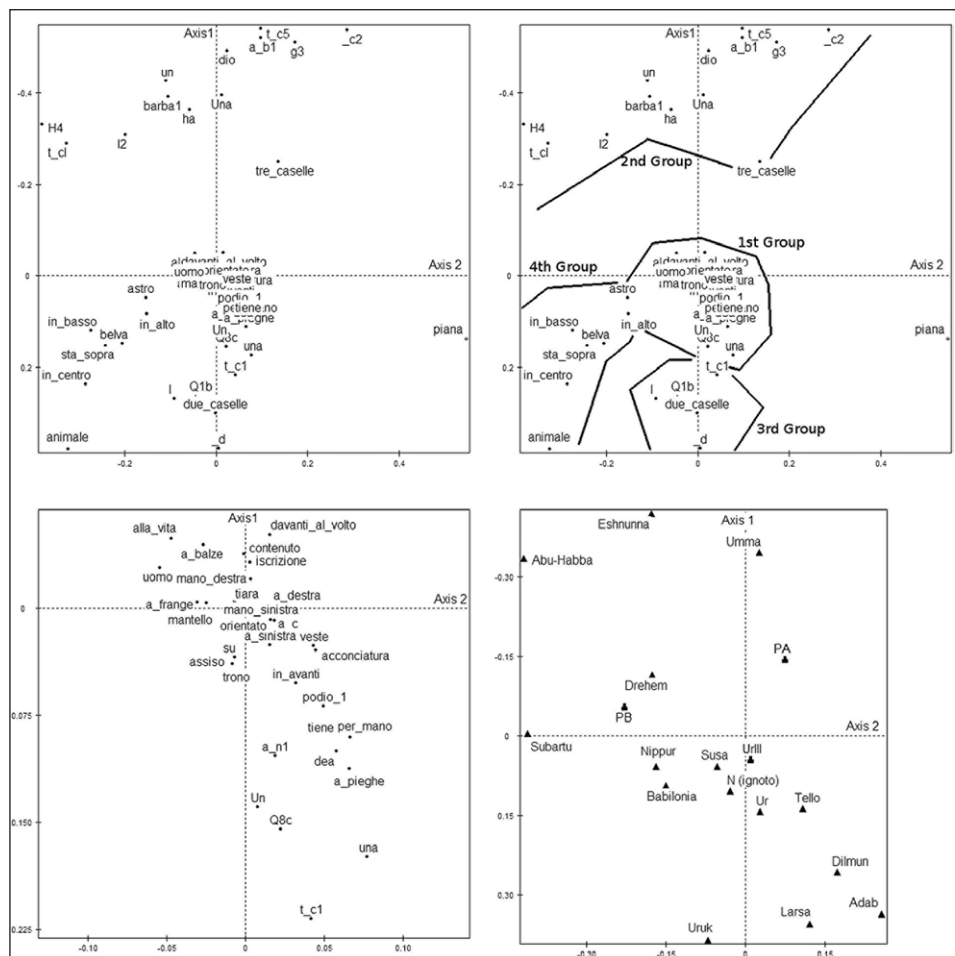


Fig. 7 – Second analysis results. Graphics showing the relations among the forms. An enlargement of the region around the origin is provided in the bottom-left graphic, while in the bottom-right one are shown the relations among external data expressing geographical origins and rough dating.

the forms referred to the general categories that are used to describe the scenes – like hairstyle (*acconciatura*), orientation (*orientato*), position of the arms and body (*mano_destra*, *mano_sinistra*, *tiene_per_mano*, *assiso*), etc. One finds here also a number of very frequent features of Ur III presentations: examples are the fringed mantle (*mantello*, *a_frange*), usually pertaining to the clean shaven (*a_c*) man (*uomo*), the presence of the legend (*iscrizione*), etc. Their general importance also emerges when one observes the sum of

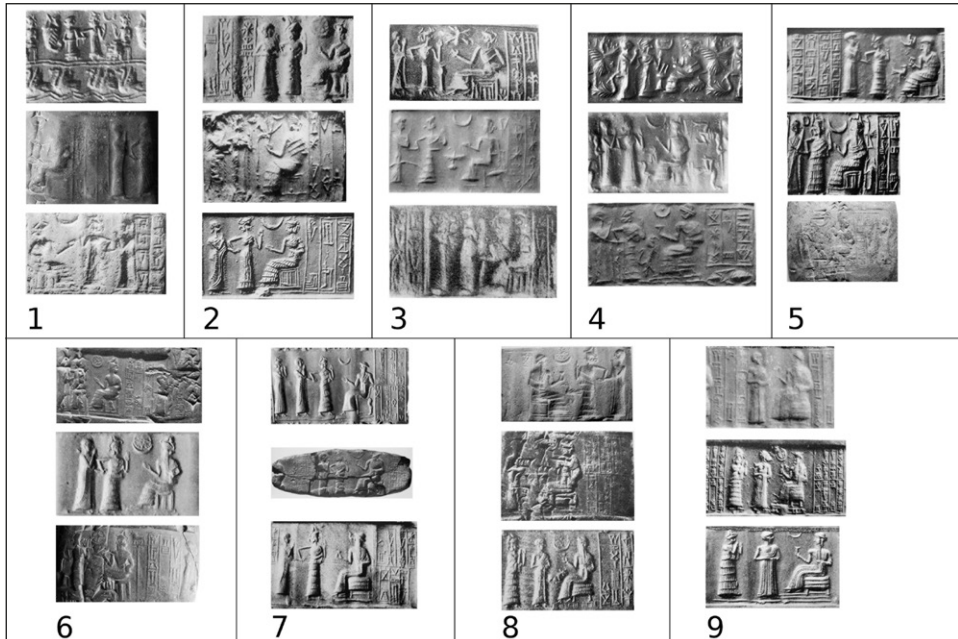


Fig. 8 – First analysis results. Classes 1/9-9/9. For each class, the first three prototypes are shown: 1/9) COLLON 1982, no. 334, Yale, NBC 5123, LEGRAIN 1925, no. 269; 2/9) LEGRAIN 1951, no. 348, LEGRAIN 1951, no. 334, PORADA 1948, no. 275; 3/9) PARROT 1954, no. 125, BUCHANAN 1966, no. 422, PARROT 1954, no. 137; 4/9) BUCHANAN 1981, no. 589, COLLON 1982, no. 403, VON DER OSTEN 1934, no. 136; 5/9) AMIET 1972, no. 1685, LEGRAIN 1951, no. 336, Yale, NBC 3505; 6/9) BUCHANAN 1981, no. 600, COLLON 1982, no. 432, Yale, YBC 1571; 7/9) COLLON 1982, no. 469, BUCHANAN 1981, no. 636, LEGRAIN 1951, no. 432; 8/9) LEGRAIN 1925, no. 291, BUCHANAN 1981, no. 646, VON DER OSTEN 1936, no. 46; 9/9) BUCHANAN 1966, no. 442, MOORTGAT 1940, no. 255, MOORTGAT 1940, no. 256.

their relative weights in the analysis: it exceeds three quarters of the sum of the weights of the 55 most frequent forms used in the analysis.

As one would expect on the basis of its position, richness and compactness, class 1/9 contains specimens that quite steadily show the basic compositional structure of the hand in hand man (or woman, in few cases) in fringed mantle and goddess in pleated robe being received by a sitting goddess (the prototypes of all classes are shown in Fig. 8). In some scenes of this class the goddess appears standing. Within this basic structure, scenes of class 1 can show some different iconographic arrangements, with features that might be related to an early date, such as some types of receiver's seat. A not very frequent element - which could indicate an early date too - appears in some scenes of class 1: the plain robe with the thick brim, worn by all characters. Integrating motifs do not vary very much, and mostly follow the scheme of

the astral symbol in the top part of the field before the receiver. On the other hand, legends are not always present, and sometimes have been erased or substituted with some integrating motifs. Especially interesting seems the position of the form indicating that a robe is pleated (*a_pieghe*). It takes place quite away from the core of forms that are close to the origin: this could mean that, besides being particularly tied to class 1, it is heterogeneous, if compared to the others. This may be derived from slightly more ancient presentations or depend on its being logically bound to compositions that are a little different from the basic scheme of the Ur III presentation.

Class 2/9 is not very different from class 1 from the viewpoint of the compositional structure of the scene, but it contains also scenes showing the male receiving god (25% of its total) and is much closer to the origin. It seems that specimens of class 2 have features that reveal a quite early date: besides many old-style iconographic elements (more frequent and evident here than in class 1), also the variability of the shape of legends can be considered a symptom of this. In the corresponding area of the forms' graphic (Fig. 6, bottom) the forms related to legends are those expressing the three-lines framed text (*tre_caselle*) with name, patronymic, and professional qualification (*_c2*), a general scheme of the most typical legend structure of the *corpus*, rather than a peculiarity of class 2, but – of course – dominant here too.

What emerges from this general picture is that especially classes 1 and 2 (thus, class I in the four-classes grouping) do collect scenes that are the closest to the basic concept of presentation in this period. Though they are not located exactly on the origin, the position of these classes largely corresponds to that of many frequent forms which belong to the first and third group (Fig. 6, bottom), and which suggest that, in general, the scheme of Ur III presentation is structured on the presence of a sitting receiving figure, a legend, two figures standing hand in hand (a man and a goddess) and wearing robes or fringed mantles, hairstyles of the kind *a_n1* (double curl) for the goddess and *a_c* (clean shaven) for the man. Of these two classes, the first is relatively further from the origin, and placed more on the left, while the other is closer to the above described first group of forms. This is well shown by the position of classes' centroids.

The scenes grouped in class 3/9 follow the same basic compositional scheme, but the integrating motifs usually placed just before the receiver are used more consistently. They are usually two: one in the top part of the field (in about half cases an astral symbol), the other in the middle. Also in this class one can find specimens bearing some clues of “archaic” production and others that have been reworked and show either heavy changes in the legend, or its substitution with integrating motifs.

Definitely marked by reworking is the whole class 4/9. Its few scenes are all very rich in integrating motifs that have been secondarily added to the field,

sometimes to substitute the legend. In some scenes of this class one finds the sitting receiving king, and not seldom traits that can suggest a quite late date.

A strong resemblance can be detected between class 5/9 and class 3, as for the general composition of scenes, but in the former the receiving male god is shown in most specimens, and integrating motifs are often more than two. On the opposite, in class 5 reworked scenes are very few.

The structural profiles of classes 3, 4, and 5 can be quickly reconstructed through a look at graphics in Fig. 6 (right, top and bottom), where their centroids are placed around the area that corresponds to the fourth group of forms. This group of forms is much more pointedly related to the crowding of integrating motifs, especially of the types of wild (*belva*) and domesticated (*animale*) animal and are associated to other forms expressing possible positions of integrating motifs in the scene (*in_basso*, *sta_sopra*, and *in_centro*). Significantly, scenes of class 3 are distributed between the region of the fourth group of forms and that of classes 1 and 2, while the peripheral position of class 4 is coherent with its inner composition (reworked scenes, large number of integrating motifs, etc.). The centroid of class 5 is just to the right of axis 2, and seems to be oriented toward the second group of forms: actually, this position expresses both the tendency to the male gender of the receiver (see here below) and to a relatively late date.

A very remarkable feature of class 6/9 is the large presence of original seal impressions (about 70% of the total), and the absence of reworked scenes. Specimens belonging to this class often show as a receiver the sitting or standing god, and just rarely a royal figure or a goddess, in a composition that mostly repeats the scheme of the hand in hand couple before the receiver. In general, the iconography of this class has traits that suggest a middle-late date. The male deity and his typical attributes seem to be the features that most of all characterize and distinguish this class.

Class 6 is partly superimposed to class 7/9: the recurring structures of scenes in this latter class are both the sitting male receiver and the hand in hand couple. In class 7 the receiver is almost always a royal figure, standing in few cases; here the integrating motifs are not very numerous (many scenes have no integrating motifs) and usually are astral symbols, never animals. The legends are mostly quite large, and distributed through two rows of lines, but some specimens are provided with much shorter inscriptions.

The relative position of form *t_c5* (headgear with multiple pairs of horns) is very interesting: its opposition (on the left) with *t_c1* (a similar headgear with a single pair of horns) signals a feature which marks an analogous opposition between the profiles of class 1 (and part of class 2) and those of classes 6 and 7. This confirms the general impression that has been just recorded. The distinction can be easily interpreted as gender-related: actually, the receiver is a male god in about 71% of specimens in which he is provided

with headgear *t_c5*, and a female deity in 86% of times in which there is an association of this role with the *t_c1* headgear.

Class 8/9 contains few scenes, all showing presentations before the sitting royal figure, either in the compositional scheme with the hand in hand pair or with one or two figures standing before the receiver. The presence of more than one integrating motif is constant: an astral symbol always in the top part of the field, before the receiver, and very often also one or two animals. Some of them have been reworked.

The specimens belonging to class 9/9 are all presentations to a royal figure with a standing man in front of him, often followed in the field by a standing goddess. An astral symbol frequently appears before the receiver (in the top part of the field), and in general these scenes' structure and the relevant legends are quite soundly and consistently organized.

In the graphic with the forms (Fig. 6, bottom), the area corresponding to that of specimens of classes 6 and 7 collects expressions of features that generally refer to a presentation in which the receiver is a male god (see forms *dio*, male god, and *a_b1*, typical hairstyle of male god). In this region of the graphic also the form related to the already discussed divine headgear with multiple pairs of horns (*t_c5*) take place. On the other hand, near *t_c5* in the graphic appear the forms *Una* and *g3*, which refer to a female figure located in the scene in a position opposite to that of the receiver and with a typical female deity ornament (a multiple tight necklace) respectively. The combination of these forms leads to think to a presentation that is made of four or three characters. The receiver is a male figure who has not necessarily divine attributes. Before him can be shown either the hand in hand pair or a standing figure of man, and in both cases the presentation ends with an isolated standing goddess. Such compositional structures have just been observed not only in the description of class 6, but also in classes 7, 8, and 9. The position of the latter classes' centroids (in particular those of classes 7 and 9) corresponds to forms like *H4*, *t_cl*, *barba1*, and *un1*. Of them, the first two refer to attributes of the receiving king (respectively, the padded stool seat and the hemispheric hat with the thick brim), the others are more generally signs of male gender (beard and article "a", male). Form *l2* corresponds to the composite integrating motif made of a sun disk inscribed in a moon sickle, quite frequent in all these classes.

Summarizing, class I collects a large number of scenes that reflect the basic structure of the concept of presentation as it was adopted in the Ur III period, a structure that presumably dates back to quite early times or styles. Class II is made of scenes that were designed similarly to those of class I, but on the average contain more integrating motifs and are sometimes later rearrangements of old or "old-style" scenes. One can attribute to specimens of this class a little later date. Scenes of class III are exactly the same of class 6, thus they mostly pertain to a middle-late date and express the presentation

before the male god. They suggest also a compositional and conceptual relation between this kind of scene and the presentation before a royal character. Class IV groups all types of presentation before a king: of them, those in class 8 have features that can be interpreted as the legacy of older styles and compositions, while scenes of class 9 seem to follow a mature and much more strictly defined scheme. Class 7 can be logically located half-way between them.

8. ANALYSIS OF THE FORMS THROUGH THE EXTERNAL FEATURES

What clearly emerges from the analysis in which data were crossed with the external features is a very strict similarity of the resulting graphic with the one related to the analysis of the scenes (Fig. 7, top, and 6, bottom): the forms used in the scenes' description are distributed very similarly. The comparison between the two graphics pertaining to this second analysis (Fig. 7) is quite difficult, because the different elements that they collect are seemingly distributed according to different orientations. This may be due to a very uneven distribution of the scenes through the mentioned sites, and in fact some sites are related to very few specimens. Another element that could help in a correct interpretation of the graphics is in the bottom right quadrant of the forms' graphic. It is the descriptive form *piana* (plain robe), which can be deemed an anomalous element: it is neither very frequent, nor definitely rare, and is in a peripheral and quite isolated position, very far from both the origin and any other form.

Observing the position of the geographical origins, the closest to this region are Dilmun and Tello. Scenes depicted on seals found in these sites actually show relatively often characters wearing the plain robe, which may be attached to an early date. The connection of Dilmun with such a peripheral position might be meaningful, since its actual geographical location is very peripheral.

In the top part of the forms' graphic one finds a group of elements that strictly resembles the second group of Fig. 6 (bottom), except for few differences. The forms that appear on the left are compatible with the scenes showing a receiving royal figure sitting on the padded stool (*H4*) and wearing the hemispheric cap with the thick brim (*t-cl*). Form *l2* indicates the moon sickle with the sun-disk, an integrating motif which is very frequently located in the top part of the field, just before the receiver. Right of it, *barba1* (long beard) can be considered here the expression of a connection between two groups of forms. They suggest two relatively well defined categories of scenes that have already been observed and described in the former analysis. They usually show a presentation before either a god or a king. Very often the male receiving figure is bearded (in particular if he is a god), and almost always other bearded figures do appear in scenes in which the receiver is either a god or a man/king. Quite frequently such scenes contain also the sun disc within the moon sickle.

The distribution of forms in this region is almost exactly superposable to that of the second group of the graph in Fig. 6 (bottom-right), that contains the distribution of forms in the scenes' analysis. Here, like there, forms referable to the receiving king are quite close to those of the presentation before a god, and the semantic border or interface between the two subgroups can be located in the form *barba1*. Another interesting form placed half-way between these categories of scenes is *ha* (he/she has ...), which signals that a character of the scene has some object-attribute qualifying the relevant functions or nature. This could mean that, in general, an attribute related to a male receiving character implies a connotation that is basically different from that of attributes connected to female characters. In other words, attributes of male characters probably have a different semantic role in the scene than those pertaining to the female ones.

In relation to this region of the graphic, the place-name Umma is evidently the most central, while more on the left is Eshnunna, and much further Abu-Habba. Scenes related to the latter two sites are very few in the data set, but Umma certainly has a significant role, and its location here can be directly compared to that of class 6 in the analysis on scenes. Not just it is spatially related to the features and region that in the graphic of forms are related to the presentation before a male god; it is also important to consider that in the data set all scenes coming from Umma are known from original impressions.

In the lower region of the graphic, in opposition to the just described group of forms are the codings of moon sickle (*l*), framed throne (*Q1b*), two lines legend (*due_caselle*), and a legend mentioning name and patronymic of the seal owner (*_d*). The latter is significantly placed in opposition to the form which refers to a legend with name, patronymic, and professional qualification (*_c2*, mentioned above): although they may look very similar to each other, according to these results they should be associated to very different types of presentation. Through the features represented by these forms one could find not only traits referred to the basic idea of presentation in Ur III glyptic, but also elements that were typical of more ancient versions of presentation scenes.

In the graphic there is no clear-cut gap between this group of forms and those which concentrate around the axes intersection, all representing the fundamental traits of Ur III period concept of presentation. This suggests that the relevant features do not involve heavy differences between the scenes that were described using these forms and the basic idea of presentation in this period's glyptic. In fact, a very similar picture emerged in the graphic from the analysis on scenes (see the first and third groups in Fig. 6, bottom). Anyway, a closer look at the clump of forms placed around the intersection (Fig. 7, bottom left) gives a clearer idea of the complex border between these groups. The placement of *Un* (article "a", male) near *Q8c* (the seat of the receiver, which is quadrangular and framed, with a double vertical support) suggests the presence of a man placed at the opposite end of a scene in which a goddess (*una1* - article "a",

female - and *t_c1* - headgear with one couple of horns: if worn by the receiver, it is very often a female deity - see above the discussion on the scenes), is the receiving figure. Both thrones of the types *Q8c* and *Q1b* are definitely the most frequent ones in the whole data set. Their meaningful opposition to the *H4* type (the padded stool), which is the third most frequent type of seat in the data set, repeats that already observed in the graphic of Fig. 6 (bottom).

Uruk and Larsa are the toponyms here associated with the forms of the group placed below the origin. Few specimens in the data set come from these sites, and they can all be considered expression of «old-fashioned» styles (COLLON 1982, no. 386; PARROT 1954, no. 135 and no. 146).

On the other hand, it is very significant that the three forms expressing a rough relative inner chronology of the data set are all placed around the origin, and UR III is right in the middle of this group. Neither later periods (PB), that are located more left, nor earlier (PA), on the right and in an upper location, have similar tight relations with forms used to describe the scenes.

The toponyms of Ur, Susa, and Tello, and the form expressing the unknown provenance (N) are all connected with the region around the origin. Tello is placed on the bottom-right part of the central forms' clump, probably in relation to a quite early date (or old-fashioned style) of the related specimens. Ur is much closer to Axis 1, which may indicate a central role of scenes from Ur in the development of the 21st century figurative theme of presentation in glyptic. This outcome is very important, although it would not be a surprise, since Ur was the capital of Ur III reign. The relatively central position of Susa, located in Khuzestan, can be a little more expressive, since it could be a symptom of the long history of intense cultural and political interaction between this region and Sumer.

In the bottom left region of the graphic are the forms concerning the astral element (*astro*) and the position in the upper part of the field (*in_alto*), and not far, but more distant from the axes intersection, other forms expressing the vertical absolute (*in_basso*; *in_centro*) or relative (*sta_sopra*) position of integrating motifs, as well as two specific categories of such motifs: wild (*belva*) and domesticated (*animale*) animal. This region largely corresponds to that of the fourth group of Fig. 6 (bottom-right). Elements connected to the category *animale* are chronologically distributed in a quite uniform way through the Ur III period, while the category *belva* contains some features typical of more ancient scenes (e.g. Late Akkadian ones) or relatively frequent in seal impressions (so their presence in the scene was mostly planned on the occasion of the first cut of the seal).

These forms could suggest a relatively large number of integrating motifs in the field, a phenomenon that could be a symptom of old-fashioned compositions as well as of changes in the actual functions of the seal bearing the scene (WAETZOLDT 1995; MAYR 2001).

Place-names that appear to be the closest to this region are Babilonia (Babylon), Nippur and Subartu, all not very frequent in the data set. Anyway,



Fig. 9 – Places of origin. Map displaying the places of origin that can be directly or indirectly documented for the specimens included in the data set.

their positions, especially those of the first two, could be significant, since they represent important sites located in the most northern area.

The main differences one can locate between this graphic and the scenes' graphic are a tighter relation in the latter between some legend features (the forms *_c2* and *tre_caselle*), and their particular proximity to the axes' intersection. A similar impression comes from the observation of the positions of the astral symbol in the top part of the field (*astro* and *in_alto*), especially with reference to their relation with some forms referring to animals (*belva*, *in_basso*, *sta_sopra* etc). It seems also remarkable that the distinction between the forms *belva* and *animale* is shown in a clearer way in the scenes' graphic. Other minor differences between the two graphics can be located in the general relative inner compactness of the group of forms that surround the intersection and in the distance of the sun-disk with the moon sickle (form *l2*) from it.

The relations between the places of origin and the rough inner chronology of the data set (according to a classification mainly based on stylistic features) deserve some more observations. The whole of this information is grounded on a heterogeneous *corpus* of data and requires to be interpreted in a careful and well meditated way.

In fact, a place of origin is known for 212 (out of 354) specimens: the remaining 142 are here classified as “unknown” (N, or *ignoto*). Furthermore, many of the sites here mentioned are each related to less than five records, and only Ur, Umma, Tello and Susa are each associated to tens of scenes. Anyway, the graphic gives a picture in which place-names are distributed according to a frame which roughly respects the actual relative geographical coordinates of the mentioned sites. Right of Axis 1 are collected southern sites – in particular in the lower right quadrant – while left of it are sites located in the northern Babilonia. Exceptions to this are Subartu, which indicates a region much far North of Babilonia, Susa, which is in Khuzestan (roughly at the latitude of Nippur), Uruk, which lies in the South, but anyway appears here very close to the lower limit of the graphic, and Eshnunna, which is on the Diyala river, East of the Tigris (Fig. 9). The peculiar position of Umma could be due to the (already mentioned) strict connection of records coming from this site with sealed administrative documents. Actually, such impressions can hardly bear the signs of “long lived” (re-worked, integrated, etc.) presentation scenes, like those that one can often find on original cylinders.

9. CONCLUSION

What we can infer from the results obtained using TCA is a complex general picture which shows both the historical relations between iconographies and compositions and their conceptual orientations, providing clues to classify them.

A first general distinction is related to gender. Scenes in which the receiver is a goddess can be related to an idea of presentation which is basic, and perhaps directly linked to the roots of the concept of presentation itself. The hand in hand pair of goddess and man seems to be very tightly bound to the female divine receiver, though it can actually appear before a male – human or divine – receiver. The compositional feature of the hand in hand pair is very likely a symptom of a specific conceptual and historical background. Besides it, a number of iconographic elements, mostly expressing attributes of goddesses, such as specific types of hairstyles or ornaments, show a similar orientation. On the other hand, the scenes showing a receiving god seem to be those that are more radically connected with the presentation used in administrative contexts. Such scenes have peculiar traits and are quite well distinguished from those showing a receiving king, with which, anyway, they should have a strong relation, in particular from the point of view of composition and depiction of gestures and body poses.

The use of integrating motifs can be associated to both the composition of a scene and the uses of the seal on which they are carved. Some integrating motifs are quite regularly shown in scenes that have strong links with

administrative activities, but in small numbers. Especially animal figures are rather related with reworked scenes or with scenes that should not have had a strict relation with the administrative practices.

Among the well known different types and shapes of legends TCA pointed out a basic distinction between two- and three-lines ones. They can be respectively linked to combined formulas like “PN1, dumu [“son of”] PN2” and “PN1, dub-sar [“scribe”, or other qualification], dumu PN2”. These two very frequent legends can be associated either with two subsequent chronological phases of presentation scenes (the former being more ancient) or with different contexts of use of the relevant seals (the latter being more typical of ordinary administrative activities), or rather with both.

Provenance of seals bearing presentation scenes is an aspect which deserves to be explored in depth, but some clear regional affinities and differences already emerge: a general distinction can be detected between northern and southern sites, while eastern (East of the Tigris river) sites are closer to the former. Umma, of which scenes of seal impressions have been considered, is in a significant isolated position.

The data set that was used for the analyses presented in this work has been built with data obtained from specimens which were first selected on the basis of the relevant preservation status and readability. An important consequence of this is that the possible features of the scenes are not uniformly represented in the data set itself, nor, of course, their actual original frequencies. Anyway, this does not mean that the analyses were biased by a lack of inner uniformity: according to the values emerging from the TCA, it seems very clear that the data set we used is sufficient to locate quite well the general terms of what could be outlined better or more in detail with a larger and more regularly structured *corpus* of scenes. Actually, TCA led us to locate the possible roles and meanings of places of origin and specific iconographic features of presentation scenes, as well as the possible relations between different compositional structures and between the scenes and the different uses of the relevant seals.

Most textual descriptions used for this research are based on scenes observed in printed publications, while just a minority of them (about 13%) have been developed from the direct observation of the original ancient artifacts. We plan thus to enlarge the data set for further studies through a direct approach to original impressions.

ALESSANDRO DI LUDOVICO
Dipartimento di Scienze dell'Antichità
Sapienza Università di Roma

SERGIO CAMIZ
Dipartimento di Matematica Guido Castelnuovo
Sapienza Università di Roma

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ABSTRACT

The statistical technique known as Textual Correspondence Analysis has been used here to study the late third millennium Mesopotamian figurative languages which were used to produce the so-called presentation scenes in Ur III glyptic. For this investigation the authors prepared a data set that collected the codings of a *corpus* of Ur III presentation scenes known from cylinder seals or ancient seal impressions on administrative documents. In this paper we first offer a summary and the discussion of the aims, strategies and first results of this investigation, then the iconography of presentation scenes is interpreted through the classification of the scenes on the basis of the analysis of the forms and of their external features. The paper concludes with a general summing-up of the results and their meaning.