Readability determines the presence of writing:

materials, light effects, and sign sequences on Cretan Hieroglyphic seals

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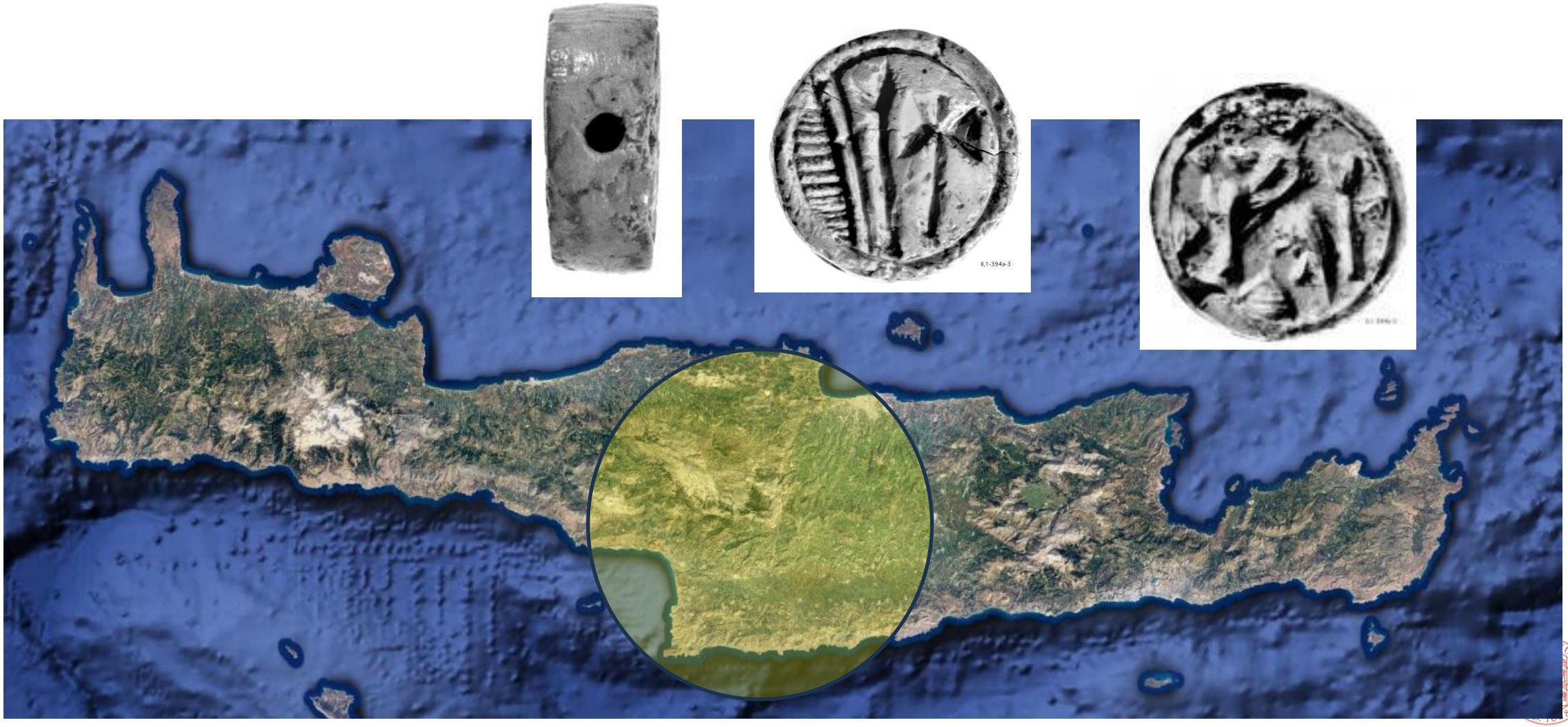
Today menu

1. Cretan Hieroglyphic seals: when, where, how

2. Dataset and methodology

3. Results and discussion: readability as a key-factor for ‘reading’ the seals

The first European writing:
End of the EBA - beginning of the MBA (2200 ca. BCE)



Middle of the MBA (1800-1700 ca. BCE)

How did seal function?

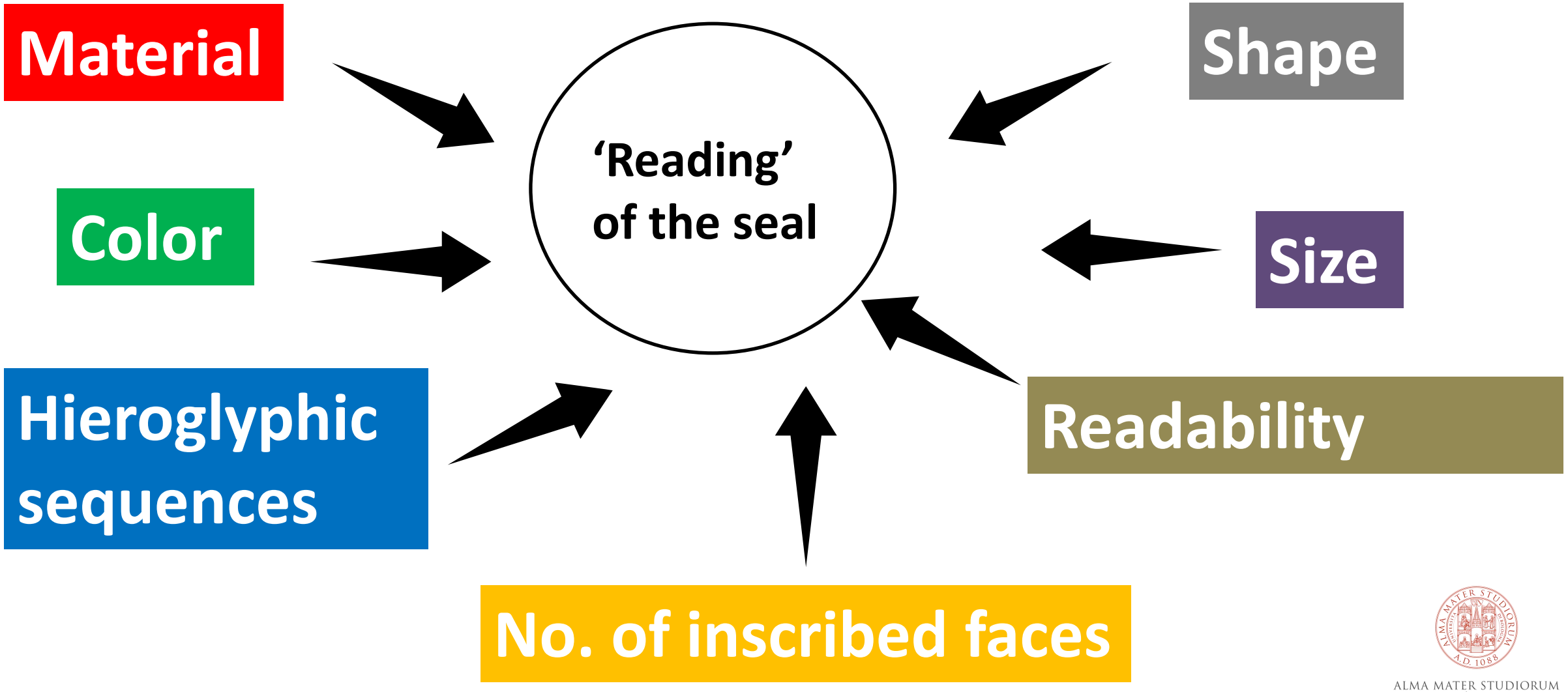
Luxuries to be worn off

Administrative tools

“To make impressions on clay, whether to secure goods or to guarantee transactions, one needs only a simple device — a seal — made of durable material, in a convenient shape, engraved with an identifiable design. But to impress other members of the community — to advertise, to reinforce, or to achieve status through display may require something more: an **exotic material**, an **elegant or unusual shape**, an **innovative design**, perhaps requiring **sophisticated technology** [...] So judging a seal by material alone may provide contradictory or inadequate answers to questions of status. We also need to factor in contextual evidence. Unfortunately this too can be ambiguous or even introduce the danger of circular argument”. (Krzyszkowska 2012: 739-740)

Material	Inscribed	Uninscribed
Jasper	26	22
Agate	12	13
Carnelian	11	25
Chalcedony	10	8
Rock Crystal	3	16

Building a Social Network Analysis



Michelle Wang (2019) ‘Woven writing in Early China’. Art History 42/5: 826-861

Legibility and readability: a meaninful difference

#245b

#303b

Can I distinguish the motifs?	**NO**	**ALMOST COMPLETELY**
Can I distinguish the techniques?	**PARTIALLY YES**	**YES**

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From scalar to discrete

Very high

#195

High

#257c

Moderate

PTSK13.1485

Low

#229

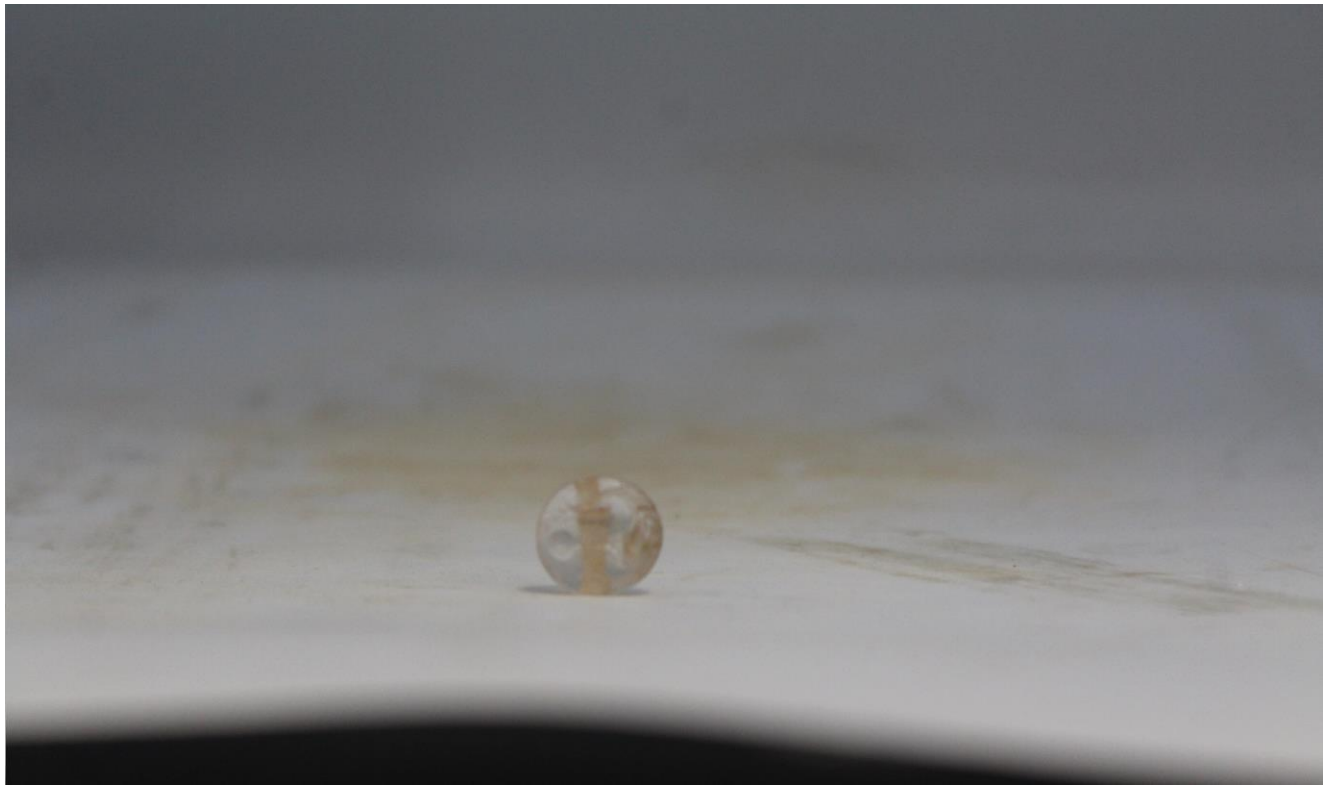
Very low

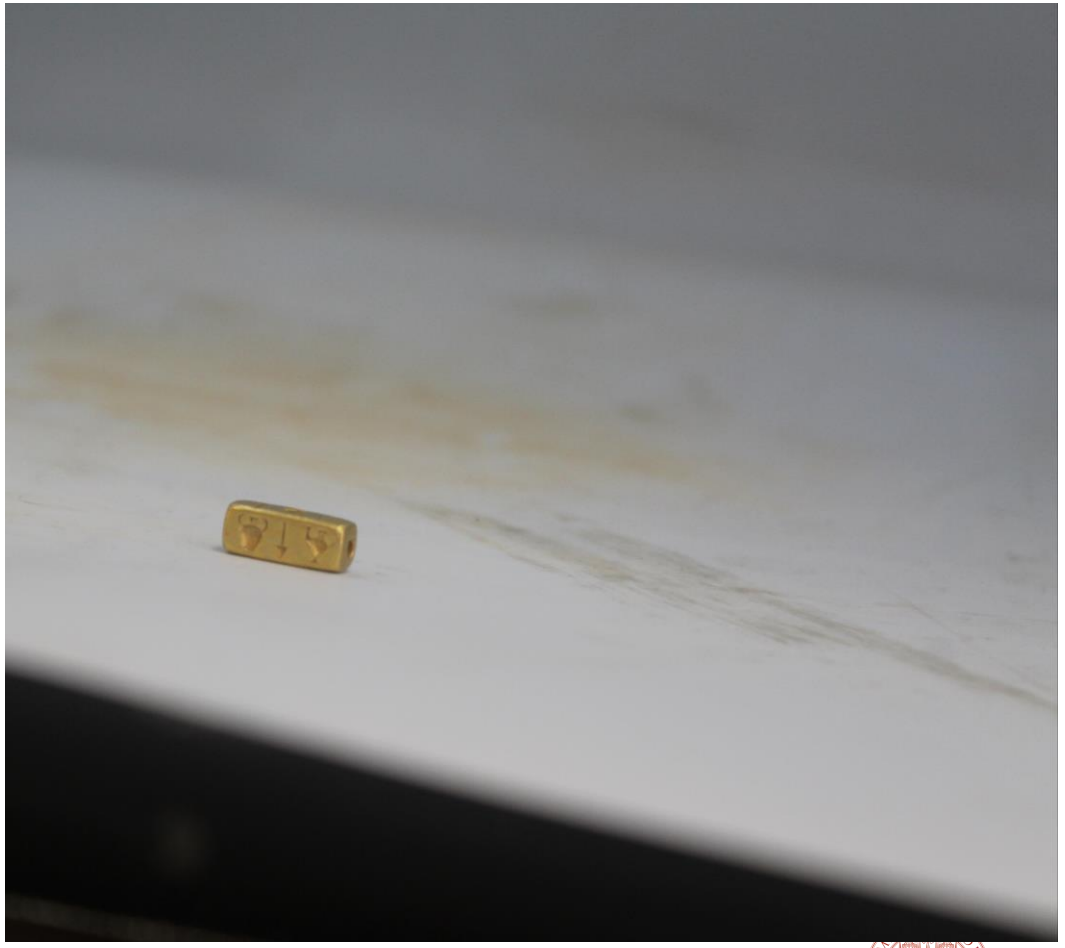
#267a

Papadopoulos & Sakellarakis 2010

Rueff 2019

Reproducing the desk of Minoan seal makers





No. of nodes: 108

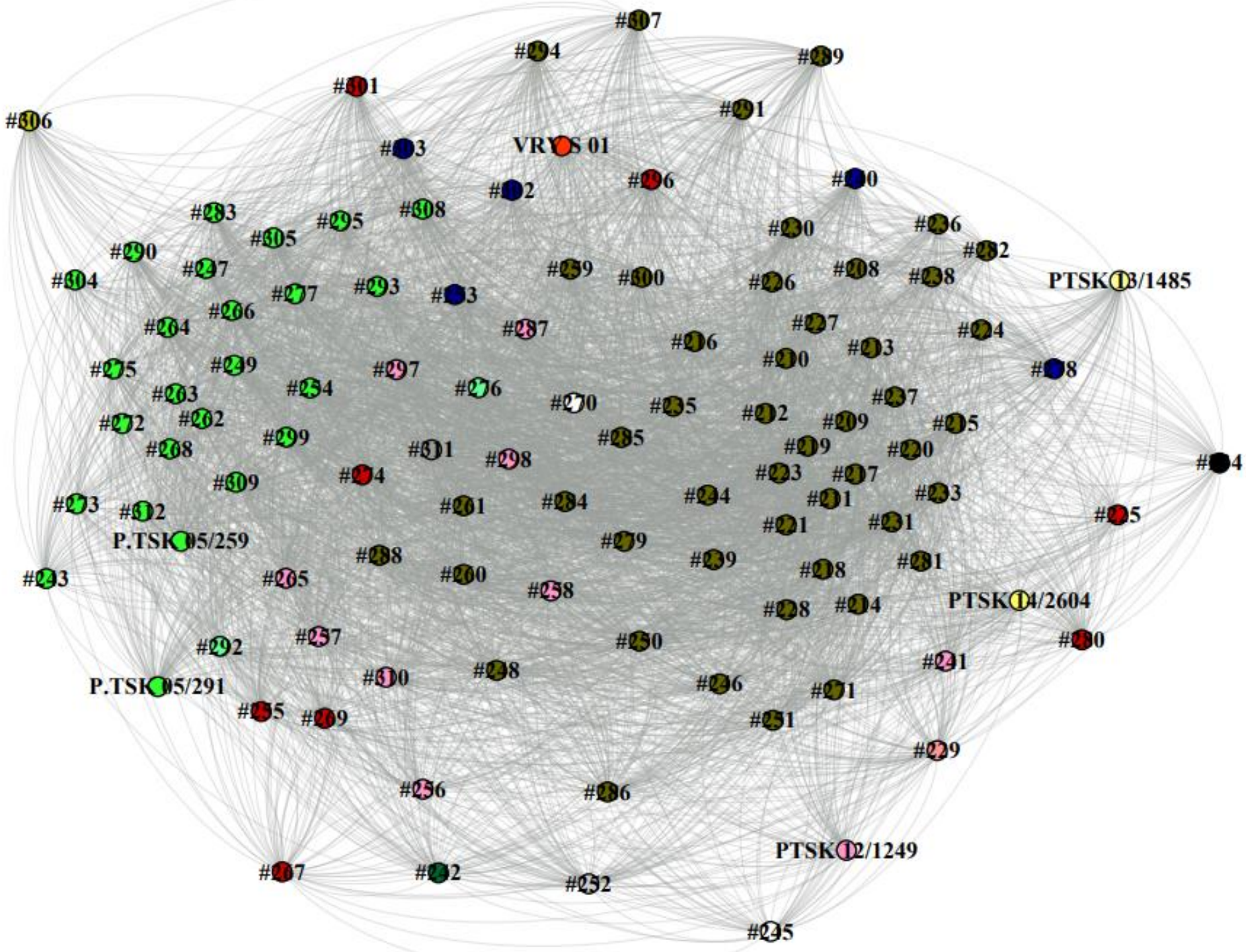
Relevant statistics

Avg. path legth = 1.258

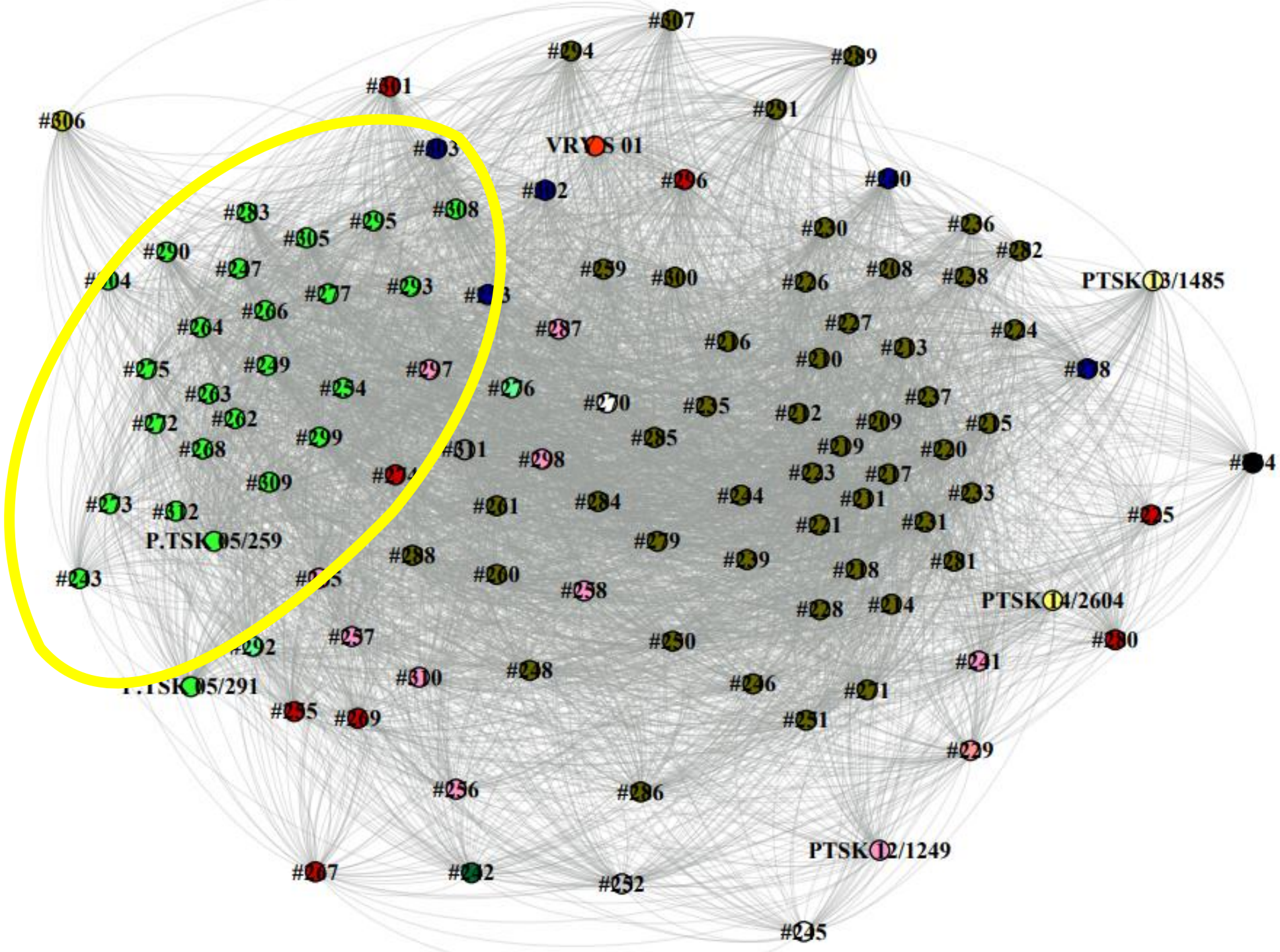
Avg. degree = 80.165

Avg. weighted degree = 154.789

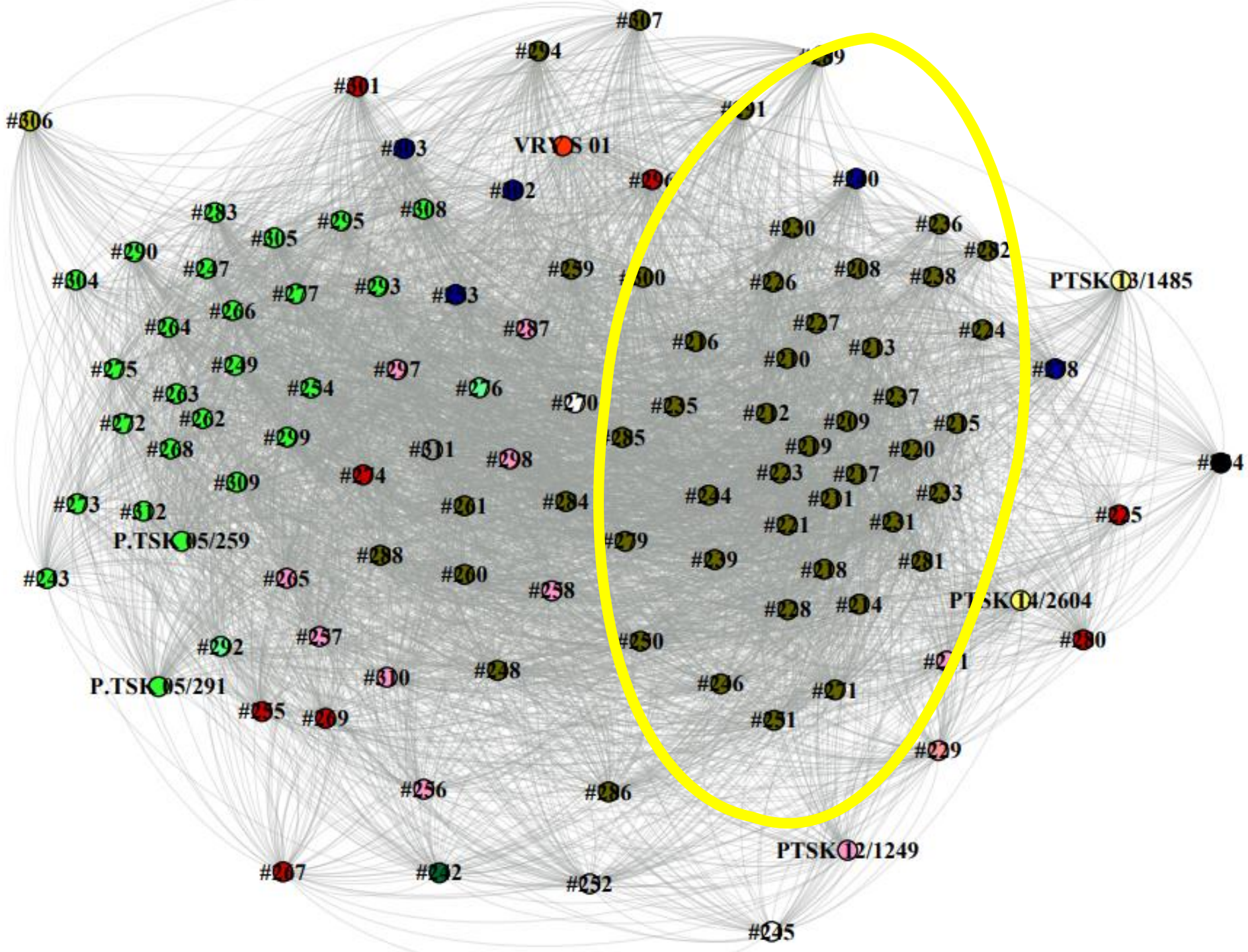
Density = 0,724



Jasper


VRYOS 01
PTSK 13/1485
PTSK 14/2604
PTSK 12/1249
P.TSK 05/259
P.TSK 05/291

Steatite


VRYS 01
PTSK 13/1485
PTSK 14/2604
PTSK 12/1249
P.TSK 05/259
P.TSK 05/291

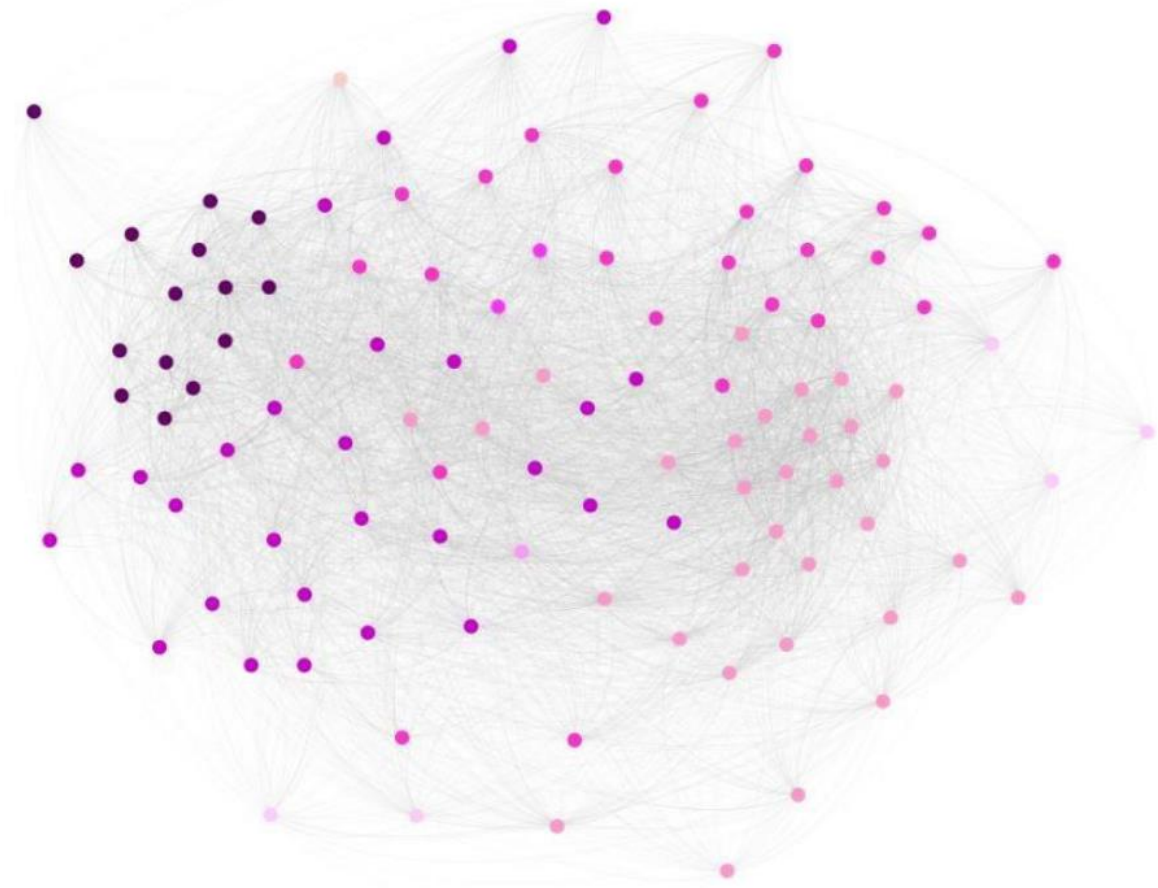
In search of correlations...

Material / Inscribed faces	1/3	1/4	2/3	2/4	3/3	3/4	4/4
Jasper	0%	0%	11.5%	4%	42%	11.5%	31%
Agate	10%	10%	30%	0%	30%	0%	20%
Carnelian	20%	0%	10%	0%	30%	10%	30%
Steatite	58.5%	6.5%	9%	6.5%	6.5%	6.5%	6.5%

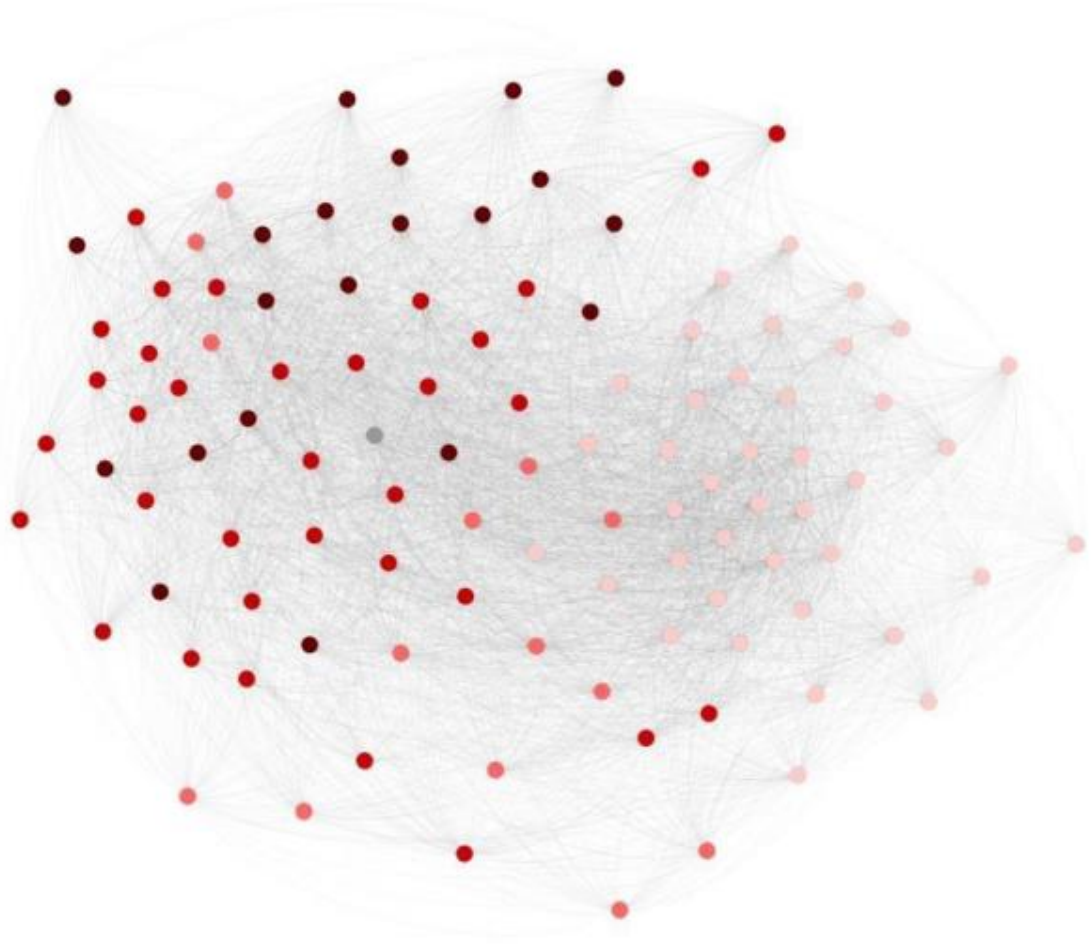
$\chi^2 = 19162$; $p < 2.2e^{-16}$

1 face = 1 administrative role (Poursat 2000; Civitillo 2016)

Readability vs. number of inscribed faces



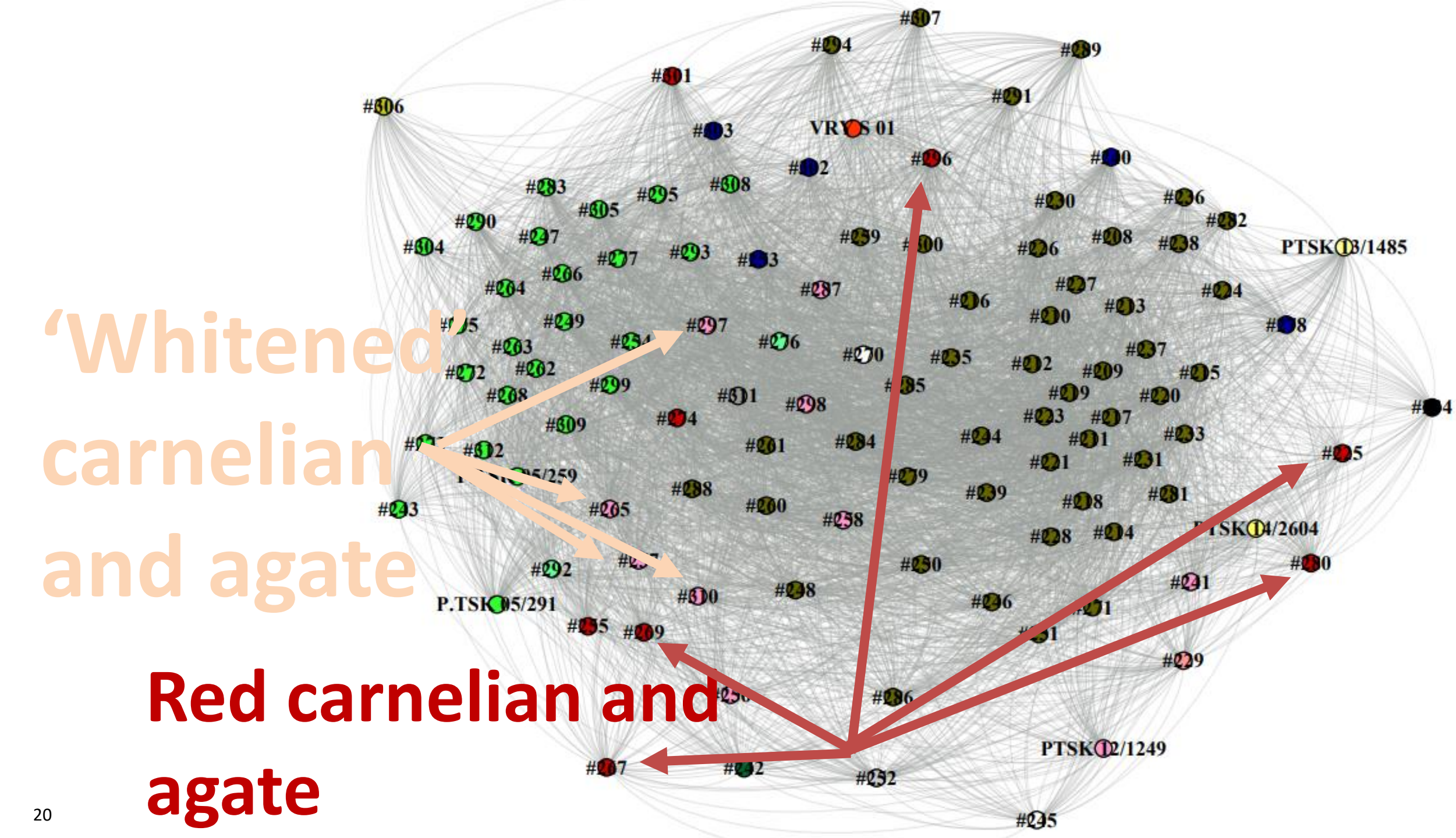
Scale of readability



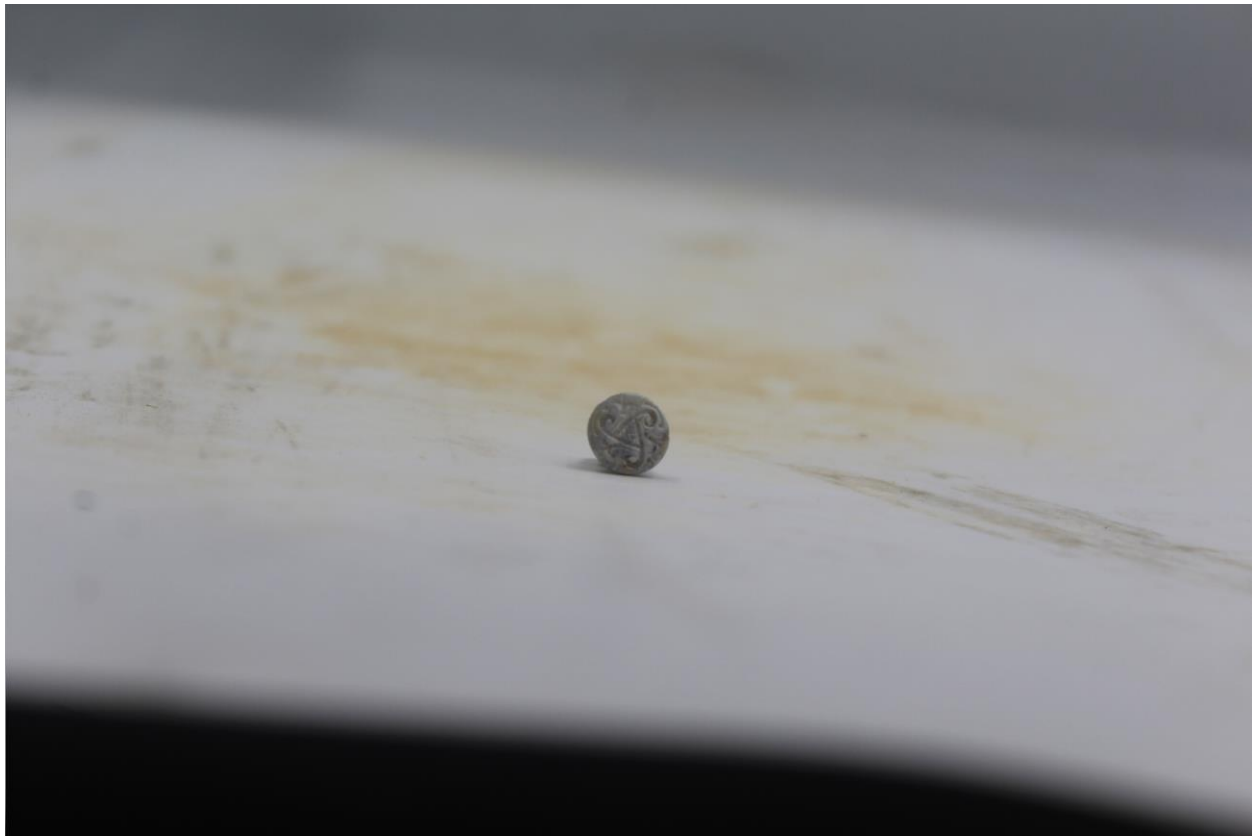
Scale of inscribed face

Readability/ Inscribed faces	1 face	2 faces	3 faces	4 faces
Very high	0	3	**10**	3
High	3	5	**11**	9
Moderate	**13**	2	8	6
Low	**19**	5	6	1
Very low	**3**	2	0	1

$\chi^2 = 36.429$; $p = 0.0002763$


‘Whitened’ carnelian and agate
Red carnelian and agate
VRY S 01
PTSK 3/1485
PTSK 4/2604
PTSK 2/1249
P.TSK 5/291

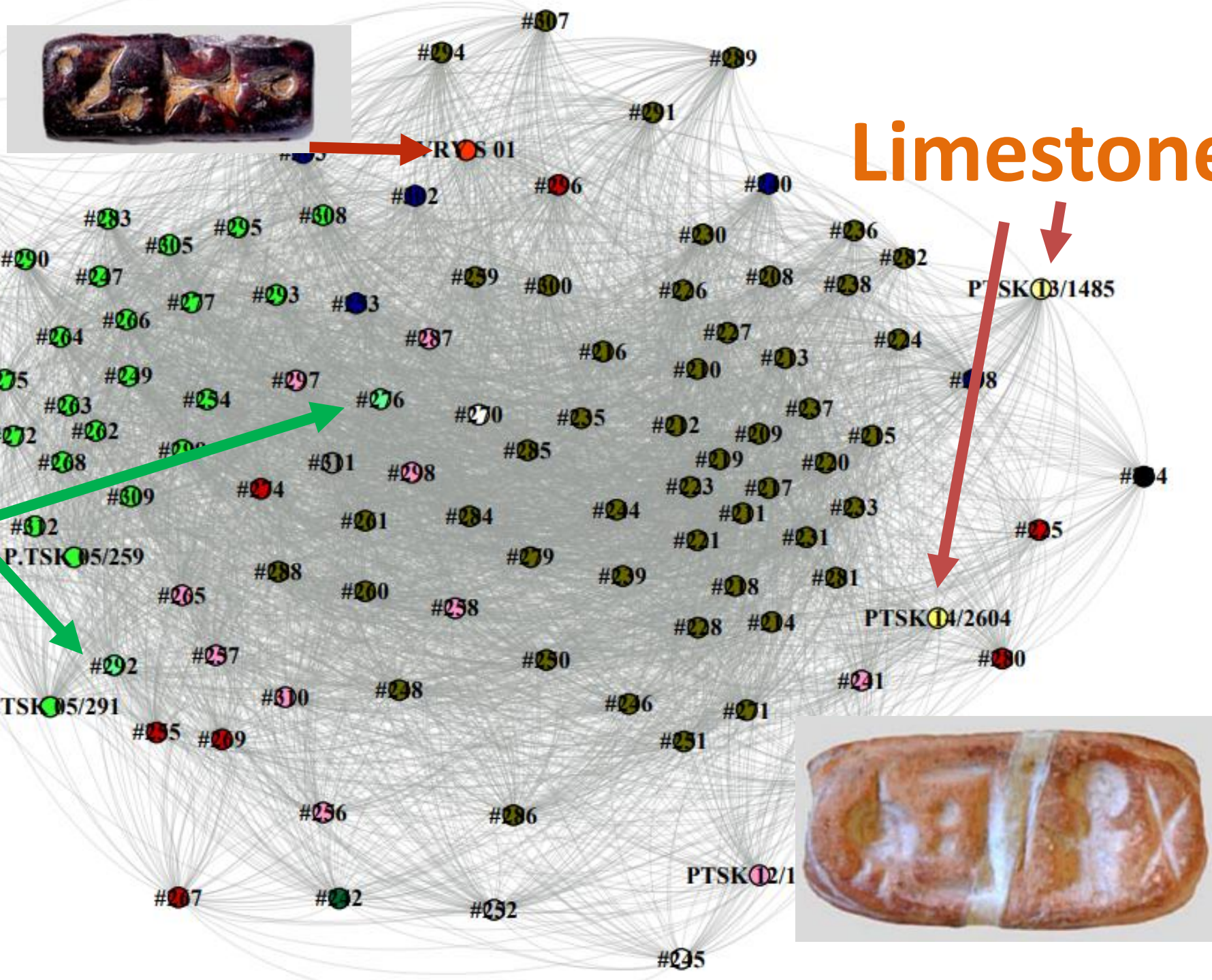
Comparison in the light box



Red serpentine

Pseudo-jasper

Limestone



	CH 044-049	CH 038-010(-031)	Other
Steatite, color group (a)	13 (76.5%)	4 (23.5%)	0 (0%)
Steatite, other colors	6 (66.5%)	0%	3 (33.5%)
Hard stones	1 (20%)	0 (0%)	4 (80%)

	Soft stones	(Medium-)Hard stones and gold	*Total*
High to very high	10%	47%	57%
Moderate	10%	16.5%	26.5%
Low to very low	0%	16.5%	16.5%
Total	20%	80%	

Table 4.15 – Distribution of *hapaxes* composed by more than 2 syllabograms according to material and readability

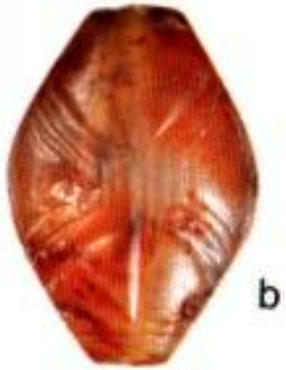
To sum up

- Readability (and legibility) may have **affected the presence of writing**: the more inscribed seals clearly prefer more readable materials;

- This preference could have **oriented the choice** of material and techniques;

- High readability, and therefore, opaque materials such as green jasper and ‘whitened’ pieces were likely considered of a **higher rank** with respect to translucent and transparent ones.

Back to the future



Material	Inscribed	MM II (uninscribed)	MM II-III ('Architectural')	LM I ('Talismanic')
Jasper	42%	26%	29%	22%
Agate	19%	15%	15%	17%
Carnelian	18%	30%	10%	54%
Chalcedony	16%	10%	2%	2%
Rock Crystal	5%	19%	44%	4%

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Thank you for your attention!

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