Uzbek Classifiers, Clusters and Natural Units

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In this paper, we analyze several groups of Uzbek classifiers, based on the kinds of nouns with which the classifiers combine. While the most discussed opposition is one between sortal ("count") classifiers (e.g. *dona* 'item') and mensural ("mass") ones (e.g. *qop* 'sack', *litr* 'liter'), our main focus is on two additional sets: group classifiers (e.g. *guruh* 'group', *gala* 'flock, pack'; (1)) and granular classifiers (*zarracha* 'particle', *don* 'grain', *kristal* 'crystal', *tola* 'string'; (2)).

(1) ikki   guruh   bola
two CL_{GROUP} child
'two groups of children'

(2) ikki   zarracha   qum/ tuz/ shakar/ guruch/
two $CL_{PARTICLE}$ sand/ salt/ sugar/ rice
'two particles of sand / salt / sugar / rice'

Our formal analysis is formulated within the framework of Iceberg Semantics (Landman 2020). Within this system, the denotation of a noun is represented as a pair of sets: **the body** and **the base** <body, base>, where the body corresponds to the set that is traditionally taken to constitute the denotation of the noun (within an extensional approach), and the base is the set that generates the body under sum. We propose that the major difference between sortal and mensural classifiers has to do with the nature of the measure function they contribute. Sortal classifiers contribute exclusively a cardinality function, whereas mensural classifiers introduce a specific measure, such as LITER, KILO, or BOWL.

Group classifiers are special since they introduce an operator that applies to properties of individuals and returns properties of clusters, in the sense of Grimm (2012) and Wągiel (2021). A spatial cluster is a sum of objects that share the same property and are all transitively connected, i.e., "connected through a series of mediating entities" (Wągiel 2021: 193). In turn, a social cluster is a cluster of roles within a social space. Group clusters turn properties of individuals (and possibly roles) into sets of clusters relative to these properties and further specify that the number of these new cluster-units equals *n*, the number introduced by the numeral.

$[[guruh]] = \lambda n \lambda P \lambda x: P \subseteq$ HUMAN. $<{*}CLSTR(base(P))$ & $card_{CLSTR(base(P))}(x) = n, CLSTR(base(P))>$

Granular classifiers function quite similarly to singulative suffixes in Celtic, Slavic and Semitic. They apply specifically to granular aggregate nouns, such as *qum* 'sand', *shakar* 'sugar', or *guruch* 'rice'. Following Chierchia (2010) and Landman (2020), we propose that the semantics of such nouns is not atomic; for instance, the denotation of *guruch* contains not only grains of rice and their sums but also halves of grains and even smaller parts, pluralities of these parts, as well as rice powder. Granular classifiers extract natural units associated with such nouns by contributing the Natural Unit (NU) measure function (Krifka 1989). They further specify that the number of such natural units equals the number denoted by the numeral.

$[[zarracha]] = \lambda n \lambda P \lambda x <{*}\Pi_{NU}(body(P))$ & $card_{\Pi NU (body(P))}(x) = n, \Pi_{NU}(body(P))>$