

**Comparing Near Eastern Neolithic Megasites and Southwestern Pueblos:**

**Population Size, Exceptionalism, and Historical Trajectories**

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*Abstract*

Çatalhöyük and other Near Eastern Neolithic ‘megsites’ are commonly interpreted as exceptional because of their large size and early dates. In this paper, we question exceptional claims about the size and social organization of megasites like Çatalhöyük by comparing them to pueblos in the American Southwest. We argue that Çatalhöyük and other Near Eastern Neolithic megasites are better understood as large villages whose size, layout, and social organization compare readily to many of the late prehispanic and historic period pueblos in the American Southwest. We suggest that four factors contribute to disparate interpretations of structurally similar sites in the Near East and American Southwest: 1) surface architectural visibility; 2) different regional intellectual traditions that emphasize ‘micro-’ vs ‘macro’ scale social organization; 3) a tendency toward overestimation in archaeological population estimates, especially when the ‘biggest’ or the ‘earliest’ sites are involved; and 4) perceptions of continuity with later time periods.

Çatalhöyük is often described as a Neolithic “megasite” with a large, densely packed population that is puzzling because it predates by 3000 years the kind of urban settlement associated with early cities. Although no longer seen by most archaeologists as the ‘first city’ (e.g., Mellart 1967), Çatalhöyük is nevertheless still viewed as exceptional: a site whose size “pushes the idea of an egalitarian village to its ultimate extremes” (Hodder 2006, 98), a huge street-less mass of houses that was a “‘dead end’ in the evolution of human architecture and settlement planning” (Ben-Shlomo and Garfinkel 2009, 204). The megasite phenomenon in general remains a key problem in Near Eastern Neolithic archaeology, subject to inquiries about how megasites fit within settlement systems (Akkermans 2013; Kuijt 2000; Simmons 2007; Verhoeven 2006), as well as a revived interest within some circles in megasites as precursors in the process of urbanization (Bogaard and Isaakidou 2010; Der and Issavi 2017; Mazzucato 2016).

In this paper, we raise questions about exceptional claims regarding the size and social organization of Near Eastern megasites like Çatalhöyük by comparing them to pueblos in the American Southwest, in particular the pueblo of Awat’ovi (Fig. 1). Although comparisons between Çatalhöyük and pueblo architecture are not uncommon (e.g., Hodder 2006, 25), these are often anecdotal (but see Mills 2014). Here we suggest that more systematic comparison can provide insights into key questions about Çatalhöyük population levels and social organization, and about the phenomenon of Near Eastern Neolithic megasites more generally. Awat’ovi has

roughly the same architectural footprint as Çatalhöyük, but is estimated to have had a population less than half the size, and is interpreted as a classic ‘tribal’ village rather than a proto-urban centre. We argue that four factors contribute to disparate interpretations of these structurally similar sites: 1) surface architectural visibility; 2) different regional intellectual traditions that emphasize ‘micro-’ vs ‘macro’ scale social organization; 3) a tendency toward overestimation in archaeological population estimates, especially when the ‘biggest’ or ‘earliest’ sites are involved; and 4) perceptions of continuity with later time periods.

Rather than outliers requiring special explanation, we argue that Çatalhöyük and other Near Eastern Neolithic megasites are better understood as large villages whose size, layout, and social organization compare readily to many of the late prehispanic and historic pueblos in the American Southwest. While megasites were undoubtedly important social and demographic centres, we suggest that current population estimates exaggerate their uniqueness within ancient farming societies. While we still need to explain how and why some places experienced more aggregation than others, there is little need to trumpet Near Eastern Neolithic megasites as particularly unusual in terms of their size or social organization.

### **The Case for Comparison**

Çatalhöyük (Fig. 2a) is located in central Turkey and was occupied for more than 1000 years from ca. 7100 – 6000 BC (Bayliss et al. 2015; Hodder 2014). The site consists of two large mounds of stratified mudbrick architecture on either side of a small river; the eastern, larger mound dates to the Neolithic and is the focus of this study. The 13.5 ha eastern mound rises 17 m above the floodplain with at least two distinct peaks suggestive of different zones of occupation, though both peaks appear to date primarily to the Neolithic (Matthews 1996). The site reached its maximum extent circa 6700 - 6500 BC, which roughly equates to the Çatalhöyük Research

Project's South levels M, N, O and 4040 levels F and G, and to Mellart's levels VIII - VI (Hodder 2014, 11). Recent work suggests that a significant transformation occurred circa 6500 BC, with changes in building size, layout, and distribution. Most buildings appear to have had only a single story (but see Hodder 2009), although roofs were likely commonly used for outdoor activity (Hodder 2006), just as they were in historic Pueblo villages (Mindeleff 1891).

Awat'ovi (Fig. 2b) is located in northeastern Arizona and was occupied for roughly 450 years from ca. AD 1250 – 1700 (Smith 1971). The 10.6 ha site sits on the edge of a mesa overlooking a broad plain. The earliest occupation of Awat'ovi was in the Western Mound which grew to a four-story pueblo of 1000 rooms or more, now visible as an irregular masonry rubble pile rising up to 8 m above bedrock. Beginning in the AD 1400s occupation at Awat'ovi began to expand to the east, but occupation of the western and eastern sides of the site overlapped considerably. The site eventually comprised more than 4000 rooms, though by the late AD 1400s the Western Mound appears to have been largely vacated. A Spanish mission was built in the southeastern corner of the site in AD 1629, and the village was destroyed in AD 1700 by a coalition of Hopi villages (Montgomery et al 1949).<sup>1</sup>

Both sites appear to lack a surrounding community of smaller settlements. Awat'ovi had a neighbour of comparable size 5 km to the northeast until ca. AD 1500, after which the closest large village was 15 km to the northwest; a total of four large villages, one on each of four neighbouring mesas, constituted the Hopi cluster in the 16<sup>th</sup> and 17<sup>th</sup> centuries. A search for sites in the 1000 km<sup>2</sup> around Çatalhöyük confirms that the site was uniquely large for its time period and that nearby small sites largely predate it (Baird 2006). Çatalhöyük was apparently more isolated than Awat'ovi, separated from its closest known potentially contemporary village (Canhasan) by 60 km, and from the closest Neolithic megasite, Asikli Höyük, by 130 km.

Çatalhöyük and Awat'ovi have roughly the same archaeological footprint (Table 1). Çatalhöyük covers a slightly larger area and has a taller mound, but these differences can be largely explained by three factors. First, Çatalhöyük was occupied two to three times longer than Awat'ovi. Second, the mudbrick architecture of Çatalhöyük is likely to generate a mound of residential debris more quickly than the masonry architecture of Awat'ovi, which can be more readily recycled as old buildings are replaced, decreasing its overall volume. The frequent rebuilding of rooms in the same place at Çatalhöyük (Düiring 2005) also contributed to the height of the tell. Third, the horizontal footprint of the sites may be expected to differ because multi-story architecture was common at Awat'ovi, enabling greater packing of floor area into smaller horizontal spaces. The area of domestic space per residential unit is nevertheless comparable between the two sites: households at Çatalhöyük occupied 10 - 40 m<sup>2</sup> (mean 27 m<sup>2</sup>), with main rooms that averaged 21 m<sup>2</sup> (Düiring 2007:29); rooms in the western mound at Awat'ovi averaged 5.3 m<sup>2</sup>, and although rooftop doorways were not preserved we can infer household suites of 6 - 10 rooms that are well documented at nearby precontact and historic pueblos (e.g., Adams 2002:128; Dohm 1990) for a total household floor area of ca. 30 - 50 m<sup>2</sup>. Accounting for these factors, the sites are good candidates for comparison.

Although we recognize problems inherent in comparison of archaeological sites and cultures across such vast distances of time and space, we also raise one further point to argue that these two sites are better matched than it may first appear. Recent work on the origins of agriculture and accompanying social and technological change in the Near East and Southwest North America suggest that these two sites occur at roughly similar points in time relative to the first appearance of cultigens, the transition from round to rectilinear architecture, and the first use of pottery vessels for cooking (Table 2; see Kohler et al. 2017). Both sites appear just over a

thousand years after the first appearance of effective agriculture in their respective regions and a few hundred years after the transition to rectangular, agglomerated architecture. Pottery appears earlier relative to Awat’ovi’s founding, although we note that the Southwest experienced a similarly long (2000 plus years) “Pre-pottery Neolithic” characterized by small settlements, mixed foraging/farming subsistence economies, and relatively high mobility (Roth 2016). Although late prehispanic periods in the Southwest are not often considered relevant to discussion of agricultural origins, recent work has demonstrated that these periods display many of the hallmarks of the Neolithic Demographic Transition (Kohler and Reese 2014), and can be rightly considered an analogue to the similarly long process documented for the ancient Near East and elsewhere.

This paper focuses on Çatalhöyük and Awat’ovi as case studies, but they stand for a larger population of sites in their respective regions. Though it has received the most attention, especially among the public, Çatalhöyük is not the only Neolithic megasite (defined by Simmons [2007] as more than 8 ha in size) in the Near East: sites of 10-15 hectares such as Abu Hureyra, Domuztepe, and Sha’ar Hagolan are known from Syria, eastern Turkey, and Jordan (Düring 2013; Kuijt 2000; Verhoeven 2006). And while Awat’ovi is one of the largest sites in the American Southwest, it had a number of peers in the proto-historic and historic periods. Figure 3 shows the sizes of 25 Neolithic sites from the south-central Levant<sup>2</sup> and 24 sites from the post-contact period American Southwest; the range of sizes is comparable, as is the maximum site size (neither Çatalhöyük nor Awat’ovi is included in the figure).

### **The Implications of Size**

Despite their similar architectural footprints, reconstructions of population for Çatalhöyük and Awat’ovi differ dramatically. Cessford’s (2005) estimates represent the most

rigorous attempt to model population at Çatalhöyük. He first estimated the number of collapsed structures per occupation level contained in the volume of the mound, taking into account the life span of buildings and the number of levels of occupation and allowing for 20 - 30% unoccupied space and 10 - 15% unoccupied buildings, for a momentary total of 408 – 1845 buildings. Assuming that each building occupied 40 m<sup>2</sup>, he then applied a number of per-capita area constants from Naroll (1962), Casselberry (1974), and Cook and Heizer (1968) to derive momentary population estimates ranging from 1632 to 16,605, with a mid-range of 3458 to 7983 deemed most likely (Cessford 2005, 325). The mid-range population numbers fit with other published estimates in the 5000 – 8000 range (e.g. Düring 2006, 2007; Hodder 2005; Matthews 1996).<sup>3</sup> The population of Abu Hureyra 2 in northern Syria, a comparably-sized megasite at 11.5 – 16 ha, is also estimated at 5 - 6000 for its peak using similar methods of estimation (Moore et al. 2000:273-4). The population of the much smaller site of Tell Bouqras in eastern Syria (2.5 ha) is estimated at 700 – 1100 people, equivalent to 3780 to 5940 for a settlement the size of Çatalhöyük (Akkermans et al. 1981); the 4 ha site of Asikli Höyük is similarly estimated at 1080 - 2700 people, equivalent to 4320-10,800 people for a settlement the size of Çatalhöyük (Düring 2006, 101).

For Awat'ovi, Adams et al. (2004) list 4200 total rooms, of which they estimate that 1200 may have been occupied at any one time; applying a constant of 1.5 people per room commonly used in the American Southwest (Adler 1992) results in a total of 1800 people. For this study we produced population estimates for Awat'ovi following Cessford's (2005) method. The total number of rooms was estimated from the area of rubble<sup>4</sup> (15,781 m<sup>2</sup>) and assumes an average room size of 5.3 m<sup>2</sup>, a value derived from a large excavated sample (James 1994:Table 6.1; Smith 1971), yielding a total of 2977 ground floor rooms. Note that the surface visibility of

Awat'ovi allows open space to be calculated much more accurately than at Çatalhöyük (see below); 70 - 80% of Awat'ovi's footprint consists of open space, as compared with Cessford's estimate of 20 - 30% open space at Çatalhöyük. Roomblocks were estimated to have one, two, or three stories based on rubble mound height, with constants for the proportion of upper-story rooms applied following Kintigh (1985:23), for a total room count of 3522. Following Cessford (2005:324), 10 - 20% of the structures were assumed to be abandoned but still standing. Rooms were apportioned into the two main occupations (A.D. 1300 – 1425 and A.D. 1425 – 1600) based on ceramic dates (Gilpin, in press) and population estimates were calculated separately for each occupation. Using the same per-capita area constants applied by Cessford (2005, 325-326) to total room areas, momentary population estimates range from 447 – 745 people for the early period and 739 – 1231 for the late period. Given that Cessford's population estimates for Çatalhöyük cover a period of 570 – 880 years, more than double the time modelled at Awat'ovi, we might assume that under Near Eastern dating conditions the early and late occupations at Awat'ovi could not be distinguished chronologically, producing total population estimates for Awat'ovi of 1186 - 1976. Thus, while population estimates for Çatalhöyük and Awat'ovi overlap, the 'consensus values' are substantially different and extreme values diverge considerably (Fig. 4).

A significant body of literature has developed around the idea that the form of governance in a human community is related to the number of people it contains (e.g., Alberti 2014; Bandy 2004; Bernardini 1996; Carneiro 1987; Dunbar 2011; Fletcher 1995; Johnson 1978, 1982; Ortman et al. 2014). From this perspective, increasing community size produces decision-making stress which is resolved either through community fission, the development of suprahousehold groups, or the emergence of leadership hierarchies. Of particular relevance to

this study is an apparent cross-cultural threshold of about 2500 people (+/- 500) above which formal, hierarchical leadership is almost always present (Feinman 1998; Johnson 1982; Lekson 1985; Kosse 1990).

In this light, the different population estimates for Çatalhöyük and Awat'ovi take on new significance. The population of Awat'ovi is estimated to have been below the 2500 person threshold and thus presumably had non-hierarchical leadership; in fact, no southwestern pueblo is estimated to have housed more than about 2500 people (Fig. 5). In contrast, the population of Çatalhöyük and other Near Eastern Neolithic megasites is estimated at well above the 2500-person threshold and presumably would have required a formal decision-making hierarchy.

Çatalhöyük's first excavator explained its large size by labelling it as the "first city" (Mellaart 1967; see also Jacobs 1969; Rosenberg 2003). More recent research has questioned this interpretation, noting the limited evidence of economic specialization and lack of clear evidence of leaders or a hinterland of dependent settlements (Düring 2013; Simmons 2007, 175-81), though the language of urbanism and cities lingers in other fields (e.g., Soja 2000; see critique by Smith, Ur, and Feinman 2014). Rather than a city, most contemporary archaeologists see Çatalhöyük as a massively overgrown village consisting of 'nothing but houses' (Hodder 2005, 127; see also Der and Issavi 2017, 196). But how could a settlement far above the 2500 person scalar threshold survive in the absence of more formal organization? Hodder (2005, 2006) initially classified the site as anomalous, a huge settlement seemingly held together by household ritual. More recently he has noted the importance of 'history houses' (Hodder and Pels 2010) and non-kin based sodalities (Hodder 2014) in integrating the hundreds of households present at the site. The latter idea derives at least in part from Barbara Mills' (2014) discussion of the utility of Pueblo ethnography on religious sodalities for understanding potential integrative mechanisms at

Çatalhöyük.<sup>5</sup> Düring (2013) tries to resolve the scalar contradiction by arguing that Çatalhöyük was divided into 25-50 village-sized ‘neighbourhoods’ of 2-300 people, each of which functioned relatively autonomously. Thus, its inhabitants “did not suffer from scalar social stress, because they did not live in a single, large community. Instead, their social life was compartmentalized” (Düring 2013, 38; see also Kuijt 2000). Ethnographic precedents for such densely packed, autonomous neighbourhoods, however, tend to be found only in state-level societies (e.g., Abu-Lughod 1987; Antoun 1972) where the presence of markets, laws, police, and other institutions reduce horizontal dependency among coresidents, making them a poor analogue for Çatalhöyük.

We argue that the scalar contradiction of a large population without hierarchical organization at Çatalhöyük is more apparent than real. The problem lies in the population estimates themselves, not in the proposed mechanisms of social organization.

### **Method and Interpretation in the American Southwest and the Near East**

Why have archaeologists working in the Near East and American Southwest settled on such different population estimates for Çatalhöyük and Awat’ovi despite their similar areal sizes? Below we explore four potential factors that may be at work.

#### *Surface Visibility*

Perhaps the biggest difference in architectural data recovery between the Near East and American Southwest is the visibility of architecture on the surface of sites. At most large southwestern pueblos soil deposition is slow enough, and masonry wall foundations are stable enough, that rubble piles and wall alignments are often distinct 1000 years after site occupations. In contrast, architecture is rarely distinctly visible on the surface of Near East tells, requiring costly and time-intensive excavation that seldom exposes more than 5% of a large site. Further,

the stratigraphy of large tells can be quite complex, making it difficult to trace an occupation surface across the mound (see below).

The excellent surface visibility of architecture in the American Southwest teaches an important lesson about the internal structure of large villages: while room blocks and open spaces are organized in variable configurations in different regions and time periods, rarely is the footprint of a large site filled with an unstructured mass of contemporaneous rooms (Fig. 6). Instead, blocks of rooms are arranged around open spaces that functioned as streets, plazas, courtyards, or settings for community structures. At Awat'ovi, 70-80% of the site's area consists of open space; across the Southwest, large pueblos average 57% open space (range 23 – 85%, std. deviation 16.5) (Potter 1998, Table 8.2) – twice the typical assumption for Near Eastern tells. Construction of southwestern villages could be preplanned, resulting in formal arrangements of roomblocks, or agglomerative, resulting in irregular arrangements; planned layouts tended to become more disordered over time as rooms were dismantled and reconstructed (e.g., Cameron 1999). It is also important to note that in ethnographically documented pueblos, open, ceremonial spaces (plazas) are not always formally bounded and may be difficult to differentiate from middens or other open spaces archaeologically.

How one interprets evidence for the nature and extent of open spaces at Çatalhöyük and other Near Eastern Neolithic megasites crucially affects population estimates (see Akkermans 2013, 71-72; Verhoeven 2006). Most estimates propose that nearly the entire maximum extent of megasites was occupied during their periods of peak occupation; for example, Cessford (2005) estimated only 20-30% open space at Çatalhöyük (see also Kuijt 2000). The excavators of Abu Hureyra 2 similarly propose that “the entire inhabited area of the village was covered with houses, packed tightly together,” with an estimated 37% open space (Moore et al. 2000:268,

273). Düring (2007, 158) argues that because Çatalhöyük is characterized by rebuilding of structures in the same location it is reasonable to assume that most of the mound was occupied during the four centuries of peak occupation. Barański and others (2015, 123), however, caution that overlapping life cycles of adjacent buildings and spaces suggest that the site “was not laid out in horizontally assigned building-levels but instead grew as a part of a more organic process.” The fact that the mound has at least two, and possibly three peaks (Hodder 2005, 127) also suggests that there were multiple areas of persistent occupation spaced by areas of less intense occupation. Given that the height of floors within what have been interpreted to be individual single household complexes can vary by up to 65 cm (Matthews and Farid 1996), caution is warranted when inferring temporal relationships among non-adjacent structures (see Rosen 1986). Farid (2014, 129; see also Düring 2006,70), based on a detailed attempt to improve the interpretation of stratigraphy and phasing at Çatalhöyük, expresses doubt that the extent of occupation in particular phases can be determined with any great precision and, as a result, specifically questions the accuracy of population estimates at large tell sites.

Domestic architecture at many Near Eastern Neolithic sites is exposed in only small windows, making site layouts difficult to discern, but in most large sites with broad exposures it is clear that settlements are not simply blocks of massed buildings. Instead, settlements are often characterized by what Düring (2006) terms “clustered neighbourhoods” separated by streets, courtyards, and alleys (Fig. 7). These architectural arrangements compare favourably to the configuration of roomblocks on southwestern pueblos. For example, Asikli Höyük has blocks of dense, agglomerative domestic architecture separated by pebble-paved streets and small courtyards (Esin et al. 1991; Esin and Harmankaya 1999), and Tell Bouqras has clear evidence of streets between roomblocks (Akkermans et al. 1981). At Çatalhöyük, with the caveat that the

stratigraphic levels identified by Mellart (1967) in the southern part of the site and the wall alignments identified by surface scraping in the northern part of the site (Matthews 1996) should not be considered discrete episodes of occupation, it is clear that the Neolithic architecture of the site is also organized into blocks of rooms separated by open spaces (Figure 2a) (cf. Düring 2006).

While southwestern pueblos show clear spatial patterning in residential and public spaces at a given point in time, layouts in long-lived southwestern pueblos shifted sufficiently so that most of the site area, including open spaces, was often built on at least once. This phenomenon, known as ‘settlement drift,’ has been documented in many areas of the world (e.g., Webb and Frankel 2004). Thus, although the surface of southwestern pueblos is mounded in areas of repeated/multi-story construction, trenches through plazas, streets, and other open spaces often uncover wall foundations. For example, almost every sounding in non-rubble areas at Awat’ovi revealed evidence of buried rooms or plaza kivas (see Fig. 2b). At Çatalhöyük, occupied three times as long as typical large southwestern pueblos, the effect would be even more pronounced and perhaps more difficult to disentangle given the less precise chronological tools available (e.g., radiocarbon vs. dendrochronology). The relatively well-dated excavations at the Neolithic site of Tell Sabi Abyad in northern Syria (Akkermans 2013; Akkermans et al. 2006) provide a clear example of multiple, chronologically separate, closely spaced occupations that joined together over time to form a continuous mound.

Cross-cultural patterns suggest that large settlements should include not just structured residential architecture but spaces for communal ritual as well. Ethnographic studies show that group ritual is pervasive among ‘tribal’ societies (Johnson and Earle 1987:20, 199-200), where it often serves as “a functional alternative to political power” (Rappaport 1971, 72). Large

structures or spaces in which to perform these rituals are abundant in the archaeological record of sedentary ‘middle-range’ societies (e.g., Adler and Wilshusen 1990; Bandy 2004; Iriarte et al. 2013; Moore 1996). Spaces for communal ritual have been documented at some, but not all, large Near Eastern Neolithic settlements. Small courtyards were apparently relatively common (see above), some of which, like the ‘monumental courts’ at Asikli Höyük, could have held 100 or more people, though at about 170 m<sup>2</sup> even these are relatively small by cross-cultural standards. The ‘mature aceramic’ levels of Çayönü, a 4 ha site in southeastern Turkey, contain a plaza measuring at least 50 x 25 m with several large communal/ritual structures with floor areas in the range of 100 m<sup>2</sup> (Ozdogan and Ozdogan 1989; Rosenberg and Erim-Ozdogan 2011), double the size of the largest buildings exposed at Çatalhöyük and equivalent to “low range integrative structures” found cross-culturally (Adler and Wilshusen 1990). Excavations at ‘Ain Ghazal did not expose broad areas of architecture, but even the small soundings revealed a possible courtyard wall suggestive of internal public spaces (Rollefson et al. 1992, 450). Communal architecture or sacred precincts are also known from a number of Levantine PPNB sites (e.g., Beidha, Atlit Yam, and Jericho) (Goring-Morris and Belfer-Cohen 2008), though these are less compelling analogues given their geographic and chronological distance from Çatalhöyük. At Çatalhöyük, two of the 10 X 10 m squares in the middle of the tell exposed by surface scraping contained primarily burned midden deposits, suggesting the possibility of large, central open spaces (Matthews 1996, 86). Scraping also revealed the foundations of a possible public building just to the west of these midden areas (Matthews 1996, 87-88). Although the excavated and scraped areas at Çatalhöyük are large, they could easily miss substantial open spaces within the mound, especially since the largest excavated areas were selected precisely for their locations on mound high points and positive surface evidence for architecture. If similarly

large units were placed on high rubble mounds at Awat'ovi, excavators could easily miss much of the open space present, misrepresenting the proportions of architecture and open space in the village.

The situation at Çatalhöyük boils down to whether the absence of evidence for large, public spaces can reasonably be interpreted as evidence of their absence. The fact that open spaces and public architecture are well-documented at earlier and contemporary Neolithic Anatolian settlements of smaller size make it doubtful that a settlement the size of Çatalhöyük would lack them. Some researchers (e.g., Düring 2006, 4, 304-6) have suggested that the decline in communal architecture from the PPNA through the Ceramic Neolithic reflects unspecified changes in social organization that defy the predictions of scalar group theory. The apparent decline in public spaces, however, coincides with a sharp increase in the size and stratigraphic complexity of Neolithic settlements which together make it considerably more difficult and unlikely to discover large ritual structures/spaces. The factors discussed in this section suggest that the apparent absence of public integrative spaces at megasites like Çatalhöyük is most likely due to sampling issues rather than the behaviour of megasite residents (c.f. Akkermans 2013, 71-72).

Awat'ovi and similar large, southwestern pueblos thus arguably provide a glimpse of what shorter windows of occupation might look like within the Çatalhöyük tell: areas of persistent occupation that formed tall mounds of residential debris separated by open spaces, but with sufficient stochastic variation in construction foci that the cumulative occupation covered most of the site's footprint with structures. Even in Southwest sites it is difficult to phase these building episodes without extensive excavation and the benefit of precise tree-ring-based chronologies.

*Micro vs. Macro*

We suggest that the data produced by different degrees of architectural visibility underlie contrasting interpretative emphases in the Near East and American Southwest. Because architecture in the Near East is often hard to delineate on the surface due to the decomposition of mudbrick or burial by later components, field work has traditionally focused on excavation. Compared to the American Southwest, Near Eastern excavations generally have access to larger, cheaper labour pools enabling the movement of massive amounts of material; nevertheless, excavation is still time and money intensive, and whole sites are rarely exposed. Thus, for large Near Eastern Neolithic sites the interpretative emphasis is generally on room configurations exposed in deep soundings rather than on the broader site layout.

Field work at large pueblos in the American Southwest, in contrast, has typically focused on mapping total site layouts because sites are often not deeply buried, architecture is frequently visible on the surface, and sites were occupied for relatively short periods of time, precluding the necessity of deep, stratigraphic excavations to establish the configuration of blocks of domestic architecture. Although in the past it was common for Southwest archaeologists to hire large pools of local labourers, and some large pueblos were nearly completely excavated, this practice largely fell out of favour after World War II and was replaced by the paying labour of field school students. These earlier projects remain our only spatially extensive excavated samples of late prehispanic pueblo architecture, although only the most recent of these projects, such as the excavation of Grasshopper Pueblo (Reid and Whittlesey 1999), occurred using high-resolution, modern data recovery methods (e.g., screening, flotation, etc.) that enable the types of artefact analyses now common in household archaeology. Large-scale excavations of Ancestral Pueblo sites have declined considerably in size and frequency in recent years due to changes in expenses

related to excavation and curation, as well as pressure from Native American tribes to reduce archaeological impact on ancestral sites. Although excavations still occur, broad exposures of full household suites are rare and usually restricted to smaller, earlier settlements. With fewer broad horizontal exposures of large, late pueblos, southwestern archaeologists know less about precise room configurations, doorway access, or rebuilding through time as our Near Eastern colleagues. Surface visibility on Southwestern pueblos is good enough, however, that public spaces and ritual architecture are generally well-documented.

In light of these qualities of Near Eastern and Southwestern data recovery, it is not surprising that publications on Çatalhöyük and other large Near Eastern Neolithic sites tend to emphasize the household (e.g., Atalay and Hastorf 2006; Boivin 2000; Düring and Marciniak 2005; Hodder 2006; Hodder and Pels 2010), while publications on Awat'ovi and other large southwestern villages tend to emphasize supra-household groups (e.g., clans, sodalities, moieties) and communal ritual and integration (e.g., Adams and Duff 2004; Kolb and Snead 1997; Rautman 2000; Spielmann 1998; Varien and Potter 2008).

A 'micro' bias in Near Eastern archaeology may explain why small-scale social units are invoked as a mechanism for ameliorating the scalar stress of a larger population. Düring (2006, 235, 305; 2013) for example, suggests that the heavy investment in household-level symbolism in "lineage houses" at Çatalhöyük took the place of larger-scale integrative spaces. Supra-household decision-making units like sodalities likely were present at Çatalhöyük, but by themselves would have been insufficient to ameliorate scalar stress in such a large community; sodalities were ubiquitous in larger villages in the Southwest (Mills 2014; Ware 2014), but alone they never enabled populations comparable to the consensus estimates for Çatalhöyük.

*Overestimation*

Archaeology is never conducted in a social vacuum. Examples of archaeological interpretations distorted by a nationalism, for example, are well documented (Kohl 1998). Less obvious to the public, but often discussed within the archaeological community, are biases stemming from the motivation to make primeval or magnitudal discoveries: the first, the oldest, the largest, the exceptional. Such discoveries attract media attention and increase the odds of academic promotion and funding.

James Mellaart (1964) explicitly advertised Çatalhöyük as the ‘first city,’ predating the earliest known examples by some 3000 years and dramatically contradicting the evolutionary paradigms in Braidwood’s (1948) influential *Prehistoric Men*. The site’s continued fame stems in part from this early claim, which still appears in publications aimed at a public audience (e.g., an *Archaeology Magazine* article titled “The World’s First City” [Shane and Küçük 1998]). The legacy of early claims for urban densities may make high population estimates appear more plausible than they might otherwise be. It is worth emphasizing that Cessford (2005, 326) noted that “it is possible to produce population figures for Çatalhöyük in the region of 1500 - 2000 inhabitants by consistently minimizing all assumptions,” although this observation is almost never cited by others.

### *Historical Continuity*

A final factor that may contribute to differing interpretations of Çatalhöyük and Awat’ovi is the perception of continuity with later time periods. Geographic, cultural, religious, and linguistic continuity is markedly evident among Pueblo populations of the American Southwest. Although Spanish contact and missionization was disruptive for many populations and catastrophic for others, contemporary Puebloan tribes are the clear descendants of the occupants of villages like Awat’ovi. Oral traditions preserve information about village names, migration

routes, and even ceremonies, many of which can be substantiated by archaeological evidence (e.g., Bernardini 2005). Pueblo populations received more attention from ethnographers in the late 1800s and early 1900s than almost any other area of the world, with the result that they have become entrenched in the literature as archetypal ‘tribal’ societies (Bernardini and Adams 2017). Social hierarchy is present in contemporary and ancient pueblo societies, but tends to be grounded more in control of ritual than in control of agricultural surplus or economic wealth (e.g., Potter and Perry 2000) - a strategy that fits with an arid landscape in which intensification is difficult, but which is not typically associated with ‘urban’ scale populations (see Kohler et al. 2017).

In contrast, it is unclear how the Neolithic population of Çatalhöyük relates to developments in the subsequent Chalcolithic period (Thissen 2002), making it easier to jump to comparisons of urbanism in later time periods, even though the earliest urban centres in the Near East arose in different regions and cultural contexts. Cultural links to contemporary populations are also less clear for Çatalhöyük than for pueblos the American Southwest; contemporary populations around Çatalhöyük express more concern about financial connections to the site than ancestral ones (e.g., Atalay 2012). The perception that Çatalhöyük is a key to the larger historical trajectory of the Near East provides a strong incentive to connect the site to later time periods. Sitting on the edge of the Fertile Crescent, Çatalhöyük is part of the region that gave rise to some of the earliest complex civilizations in the world. The historical trajectory of the Near East, while certainly not linear, nevertheless has a clear direction culminating in cities and states by the fourth millennium BC. When Near Eastern archaeologists (primarily those working in Anatolia) discuss the relationship of Çatalhöyük to later time periods, it is often in the context of historical trajectories and the degree to which developments at Çatalhöyük (e.g., aggregation, urban

architecture) anticipate or set the stage for more complex settlements (e.g., Der and Issavi 2017; Mazzucato 2016; Redman 1978). This perspective may encourage a more liberal approach to population estimates, producing totals compatible with hierarchical forms of organization and more in line with a trajectory that led to cities.

## **Conclusion**

The question we have addressed is whether Çatalhöyük and other Near Eastern Neolithic megasites are exceptional in terms of their large population size and dense, undifferentiated residential spaces, or whether they have been misinterpreted as such. Our cross-cultural comparison with sites of similar size but shorter occupation spans in the American Southwest suggest that the latter explanation is quite likely. We argue that even the relatively large horizontal exposures at Çatalhöyük are insufficient to reveal the site's layout, and that pueblos from the American Southwest provide cautionary examples revealing the difficulty of identifying open spaces in deeply buried sites. We suspect that large population estimates for Çatalhöyük are accepted by some Near Eastern archaeologists in part because there are insufficient site-level data to refute them (c.f. Akkermans 2013). We suggest that differences in the interpretation of Çatalhöyük and Awat'ovi are the product of biases in their respective regional intellectual traditions more than unambiguous differences in the material record.

These conclusions help to resolve some of the mystery of Çatalhöyük and other Near Eastern Neolithic megasites and place them within a more conventional interpretive framework. We interpret Çatalhöyük site as a large village, analogous to large pueblos from the American Southwest, whose internal structure likely included open spaces or community structures that facilitated the organization and integration of its population. Even in the American Southwest, with visible surface architecture and strong ethnographic analogues, distinguishing communal

from residential structures can be difficult (Lekson 1988); difficulties in identifying similar features at Çatalhöyük and other sites may in part derive simply from the difficulty of differentiating structures of specialized function without access to emic understandings of what their physical and symbolic markers may be (Mills 2014).

Our purpose here is not to say that Çatalhöyük and other Near Eastern Neolithic megasites were the same as their contemporary peers in size or social importance, but that invocation of population sizes more commensurate with urban settlements that date to millennia later is unnecessary and not well supported empirically. Clearly, Near Eastern megasites outstripped nearby settlements in their ability to attract residents, and must have exerted considerable influence on the surrounding social and physical landscape. Nor are we suggesting that the work of some of our Near Eastern colleagues is fundamentally flawed by shortcomings of methodology or interpretation. Rather, these sites are so large, both physically and in terms of their intellectual heft, that interpretation is doubly difficult. We propose that thinking about these sites and their interpretive challenges in new ways can help us to escape the constraints of past interpretations and highlight new questions that need to be asked of them in the future.

## Notes

<sup>1</sup> The destruction of Awat'ovi appears to have been prompted by that village's willingness to accept Franciscan missionaries following the Spanish reconquest of 1692 (Mongtomery et al. 1949).

<sup>2</sup> Data on the size of sites from the Levant was plotted because of its availability compared to equivalent data for Anatolia.

<sup>3</sup> A recent study by Birch-Chapman et al. (2017) presents an alternative method of estimating population in Neolithic villages based on the amount of sleeping space. Though strictly comparable data are not available for Çatalhöyük and Awat'ovi, this method produces estimates for Çatalhöyük in the same range as those cited by Cessford (2005) (i.e., 1,500 – 12,000 people), and for Awat'ovi in the range of 1,000 – 5,000 people.

<sup>4</sup> Rubble estimate excludes the mission complex, although it was built on top of earlier Pueblo architecture.

<sup>5</sup> Long-lived domestic rooms with extensive rebuilding and underfloor burial are also present in the Mimbres region of the American Southwest (Shafer 2006). These spaces exhibit many parallels to Çatalhöyük's history houses and may represent another interesting comparison to pursue. Unfortunately, well-excavated examples in the Mimbres area are few due to the catastrophic effects of looting at Classic period Mimbres sites during the twentieth century spurred by the market for Mimbres Black-on-white bowls.

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## References

- Abu-Lughod, J.L., 1987. The Islamic city: historic myth, Islamic essence, and contemporary relevance. *International Journal of Middle East Studies* 19, 155–76.
- Adams, E. C., 2002. *Homol'ovi: An Ancient Hopi Settlement Cluster*. Tucson: University of Arizona Press.
- Adams, E. C., & A. I. Duff (eds), 2004. *The Protohistoric Pueblo World, A.D. 1275-1600*. Tucson (AZ): University of Arizona Press.
- Adams, E.C., K. Dongoske, & V.M. LaMotta, 2004. Hopi settlement clusters past and present, in *The Protohistoric Pueblo World, A.D. 1275-1600*, eds. E.C. Adams and A.I. Duff. Tuscon (AZ): University of Arizona Press, 128-36.
- Adler, M.A., 1992. The Upland survey, in *The Sand Canyon Archaeological Project: A Progress Report*, ed. W.D. Lipe. (Occasional Papers 2.) Cortez (CO): Crow Canyon Archaeological Center, 11-23.
- Adler, M.A. & R.H. Wilshusen, 1990. Large-scale integrative facilities in tribal societies: cross-cultural and southwestern US examples. *World Archaeology* 22, 133–45.
- Akkermans, P. A., H. Fokkens, & H. T. Waterbolk, 1981. Stratigraphy, architecture and lay-out of Bouqras, in *Prehistoire du Levant: Chronologie et organisation de l'espace depuis les origines jusqu'au VIe millenaire*, eds. J. Cauvin & P. Sanlaville. (Colloques Internationaux 598). Paris: Editions du Centre National de la Recherche Scientifique, 485-501.
- Akkermans, P. M. M. G., 2013. Living space, temporality and community segmentation: interpreting late Neolithic settlement in northern Syria, in *Interpreting the Late Neolithic of*

*Upper Mesopotamia*, eds. P.M.M.G. Akkermans, R. Bernbeck, O.P. Nieuwenhuyse, & J. Rogasch. Turnhout, Belgium, Brepols Publishers n.v., 63-75.

Akkermans, P. M. M. G., R. Cappers, C. Cavallo, O. Nieuwenhuyse, B. Nilhamn, & I. Otte, 2006. Investigating the early pottery Neolithic of northern Syria: new evidence from Tell Sabi Abyad. *American Journal of Archaeology* 110(2), 123-156.

Alberti, G., 2014. Modeling group size and scalar stress by logistic regression from an archaeological perspective. *PLoS ONE* 9(3), 1-15.

Antoun, R.T., 1972. *Arab Village: A Social Structural Study of a Trans-Jordanian Peasant Community*. Bloomington (IN): Indiana University Press.

Atalay, S., 2012. *Community-Based Archaeology: Research with, by, and for Indigenous and Local Communities*. Berkeley (CA): University of California Press.

Atalay, S. & C.A. Hastorf, 2006. Food, meals, and daily activities: food habitus at Neolithic Çatalhöyük. *American Antiquity* 71(2), 283-319.

Baird, D., 2006. The history of settlement and social landscapes in the early Holocene in the Çatalhöyük Area, in *Çatalhöyük Perspectives: Themes from the 1995–1999 Seasons*, ed. I. Hodder. Cambridge (MA): Cambridge University, McDonald Institute for Archaeological Research, 55-74.

Baird, D., 2012. The late Epipaleolithic, Neolithic, and Chalcolithic of the Anatolian Plateau, 13,000-4000 BC, in *A Companion to the Archaeology of the Ancient Near East, Vol. 1*, ed. D.T. Potts. Malden (MA): Blackwell Publishing, 431-65.

Bandy, M. S., 2004. Fissioning, Scalar Stress, and Social Evolution in Early Village Societies. *American Anthropologist* 106, 322–333.

Barański M.Z., A. García-Suárez, A. Klimowicz, S. Love, & K. Pawłowska, 2015. The architecture of Neolithic Çatalhöyük as a process, complexity in apparent simplicity, in *Assembling Çatalhöyük*, eds. I. Hodder & A. Marciniak. (Themes in Contemporary Archaeology 1) London: Routledge, 111–26.

Bayliss, A., F. Brock, S. Farid, I. Hodder, J. Southon, & R.E. Taylor, 2015. Getting to the bottom of it all: A Bayesian approach to dating the start of Çatalhöyük. *Journal of World Prehistory* 28, 1-26.

Ben-Shlomo, D., & Y. Garfinkel, 2009. Sha'ar Hagolan and new insights on Near Eastern proto-historic urban concepts. *Oxford Journal of Archaeology* 28, 189–209.

Bernardini, W., 1996. Transitions in social organization: a predictive model from Southwestern archaeology. *Journal of Anthropological Archaeology* 15, 372-402.

Bernardini, W., 2005. *Hopi Oral Tradition and the Archaeology of Identity*. Tucson (AZ): University of Arizona Press.

Bernardini, W., & E.C. Adams, 2017. Hopi history prior to 1600, in *The Oxford Handbook of Southwest Archaeology*, ed. B. Mills & S. Fowles. Oxford: Oxford University Press, 429-44.

Birch-Chapman, S., F. Coward, E. Jenkins, & M. Maltby, 2017. Estimating population size, density and dynamics of Pre-Pottery Neolithic villages in the central and southern Levant: an analysis of Beidha, southern Jordan, in *Levant* 49(1), 1-23.

Bogaard, A., and Isaakidou, V., 2010. From mega-sites to farmsteads: community size, ideology

and the nature of early farming landscapes in Western Asia and Europe, in *Landscapes in transition: understanding hunter-gatherer and farming landscapes in the early Holocene of Europe and Levant*, eds. B. Finlayson & G.M. Warren. London: Levant Supplementary Series & CBRL, 197–207.

Boivin, N., 2000. Life rhythms and floor sequences: excavating time in rural Rajasthan and Neolithic Çatalhöyük. *World Archaeology* 31(3), 367-88.

Braidwood, R.J., 1948. *Prehistoric Men*. Chicago (IL): Chicago Natural History Museum.

Cameron, C.M., 1999. *Hopi Dwellings: Architecture at Orayvi*. Tucson (AZ): University of Arizona Press.

Carneiro, R., 1987. Village splitting as a function of population size, in *Themes in Ethnology and Culture History: Essays in Honor of David F. Aberle*, ed. L. Donald. Meerut, India: Archana Publications, 94-124.

Casselberry, S.E., 1974. Further refinement of formulae for determining population from floor area. *World Archaeology* 6, 117-22.

Cessford, C., 2005. Estimating the Neolithic population of Çatalhöyük, in *Inhabiting Çatalhöyük: Reports from the 1995–1999 Seasons*, ed. I. Hodder. Cambridge: Cambridge University, McDonald Institute for Archaeological Research, 323–6.

Cook, S. F. & R. F. Heizer, 1968. Relationships among houses, settlement areas, and population in Aboriginal California, in *Settlement Archaeology*, ed. K. C. Chang. Palo Alto (CA): National Press, 79–116.

- Der, L., & J. Issavi, 2017. The urban quandary and the ‘mega-site’ from the Çatalhöyük perspective. *Journal of World Prehistory* 30,189–206.
- Dohm, K., 1990. Effect of population nucleation on house size in pueblos in the American Southwest. *Journal of Anthropological Archaeology* 9, 201-39.
- Dunbar, R., 2011. Constraints on the evolution of social institutions and their implications for information flow. *Journal of Institutional Economics* 7(3), 345-71.
- Düring, B.S., 2005. Building Continuity in the Central Anatolian Neolithic. *Journal of Mediterranean Archaeology* 18, 3-29.
- Düring, B.S., 2006. *Constructing Communities: Clustered Neighborhood Settlements of the Central Anatolian Neolithic ca. 8500-5500 CAL. BC.* Leiden: Nederlands Instituut voor het Habije Oosten.
- Düring, B.S., 2007. Reconsidering the Çatalhöyük community: from households to settlement systems. *Journal of Mediterranean Archaeology* 20, 155–82.
- Düring, B.S., 2013. The anatomy of a prehistoric community: reconsidering Çatalhöyük, in *From Prehistoric Villages to Cities: Settlement Aggregation and Community Transformation*, ed. J. Birch. New York (NY): Routledge, 23-43.
- Düring, B.S., & A. Marciniak, 2005. Households and communities in the central Anatolian Neolithic. *Archaeological Dialogues* 12, 165-87.
- Duwe, S., S. Eiselt, J.A. Darling, C. Walker, & M.D. Willis, 2016. The pueblo decomposition model: a method for quantifying architectural rubble to estimate population size. *Journal of Archaeological Science* 65, 20-31.

- Esin, U., E. Bigakgi, M. Ozbasaran, N. Balkan-Atli, D. Berker, I. Yagmur, & A. Arli, 1991. Salvage excavation at the pre-pottery neolithic site of Asikli Hoyuk in central Anatolia. *Anatolia* 17,123-74.
- Esin, U., and S. Harmankaya, 1999. Asıklı, Neolithic in Turkey, the Cradle of Civilisation, in Ozdogan, eds. M., and Basgelen, N. (Eds.), *New Discoveries*. Arkeoloji ve Sanat Yayınları, Istanbul, pp. 115-132.
- Farid, S. 2014. Timelines: phasing Neolithic Çatalhöyük, in *Çatalhöyük Excavations: The 2000-2008 Seasons*, ed. I. Hodder. (Monumenta Archaeologica 29.) Los Angeles (CA): University of California, Los Angeles, Cotsen Institute of Archaeology Press, 91-130.
- Feinman, G. M, 1998. Scale and Social Organization: Perspectives on the Archaic State, in *Archaic States*, eds. G.M. Feinman & J. Marcus. Santa Fe (NM): School of American Research Press, 95-133.
- Fletcher, A., D. Baird, M. Spataro, & A. Fairbairn, 2017. Early ceramics in Anatolia: implications for the production and use of the earliest pottery. The evidence from Boncuklu Höyük. *Cambridge Archaeological Journal* 27, 351-69.
- Fletcher, R., 1995. *The Limits of Settlement Growth: A Theoretical Outline*. Cambridge: Cambridge University Press.
- Gilpin, D. in press. *Building Awatovi: An Architectural History of Awatovi Pueblo, Northeastern Arizona, A.D. 1200-1700*. Cambridge (MA): Peabody Museum Press.
- Goring-Morris, A. N., & A. Belfer-Cohen, 2008. A roof over one's head: developments in Near Eastern residential architecture across the Epipalaeolithic-Neolithic transition, in *The Neolithic*

*Demographic Transition and its Consequences*, eds. J.-P. Bocquet-Appel & O. Bar-Yosef, Dordrecht: Springer, 239–286.

Hodder, I., 2005. The spatio-temporal organization of the early ‘town’ at Çatalhöyük, in *(Un)settling the Neolithic*, eds. D. Bailey, A. Whittle, & V. Cummings. Oxford: Oxbow Books, 126–39.

Hodder, I., 2006. *The Leopard’s Tale: Revealing the Mysteries of Çatalhöyük*. London: Thames and Hudson.

Hodder, I., 2009. Upper Stories at Çatalhöyük. *Anatolian Archaeology* 15, 19-20.

Hodder, I., 2014. Çatalhöyük: the leopard changes its spots. A summary of recent work. *Anatolian Studies* 64, 1-22.

Hodder, I., & P. Pels, 2010. History houses: a new interpretation of architectural elaboration at Çatalhöyük, in *Religion in the Emergence of Civilization. Çatalhöyük as a Case Study*, ed. I. Hodder. Cambridge, Cambridge University Press, 163-86.

Iriarte, J., S. Moehlecke, C. M. Fradley, J. Lockhart & C. J. Gillam, 2013. Sacred landscapes of the southern Brazilian highlands: understanding southern proto-Jê mound and enclosure complexes. *Journal of Anthropological Archaeology* 32, 74–96.

Jacobs, J., 1969. *The Economy of Cities*. New York (NY): Random House.

James, S.R., 1994. Regional variation in prehistoric Pueblo households and social organization: A quantitative approach. Ph.D. dissertation, Arizona State University, Tempe.

Johnson, G.A., 1978. Information sources and the development of decision making organizations, in *Social Archeology: Beyond Subsistence and Dating*, eds. C. L Redman, M.J. Berman, E.V. Curtin, W.T. Langhorne, Jr., N.M. Versaggi, & J.C. Wanser. New York (NY): Academic Press, 87-112.

Johnson, G.A., 1982. Organizational structure and scalar stress, in *Theory and Explanation in Archaeology*, eds. C. Renfrew, M. Rowlands, & B.A. Segraves-Whallon. New York (NY): Academic Press, 389-421.

Johnson, A.W. & T. Earle, 1987. *The Evolution of Human Societies from Foraging Group to Agrarian State*. Stanford: Stanford University Press.

Kidder, A.V., 1958. *Pecos, New Mexico: Archaeological Notes*. Papers of the Robert S. Peabody Foundation for Archaeology 5. Andover (MA): Phillips Academy.

Kintigh, K.W., 1985. *Settlement, subsistence, and society in late Zuni prehistory*. Tucson (AZ): University of Arizona Press.

Kohl, P.L., 1998. Nationalism and archaeology: on the constructions of nations and the reconstructions of the remote past. *Annual Review of Anthropology* 27, 223-46.

Kohler, T.A., & K.M. Reese, 2014. Long and spatially variable Neolithic Demographic Transition in the North American Southwest. *Proceedings of the National Academy of Sciences* 111, 10101-10106.

Kohler, T. A., M. E. Smith, A. Bogaard, G. M. Feinman, C. E. Peterson, A. Betzenhauser & M. Pailes, 2017. Greater post-Neolithic wealth disparities in Eurasia than in North America and Mesoamerica. *Nature* 551, 619-622.

Kolb, M.J. & J.E. Snead, 1997. It's a small world after all: comparative analyses of community organization in archaeology. *American Antiquity* 62(4), 609-28.

Kosse K., 1990. Group size and societal complexity: thresholds in long-term memory. *Journal of Anthropological Archaeology* 9, 275–303.

Kuijt, I., 2000. People and space in early agricultural villages: exploring daily lives, community size, and architecture in the late Pre-Pottery Neolithic. *Journal of Anthropological Archaeology* 19, 75–102.

Lekson, S.H., 1985. Largest settlement size and the interpretation of socio-political complexity at Chaco Canyon, New Mexico. *Haliksa'i: UNM Contributions to Anthropology* 4, 68-75.

Lekson, S.H., 1988. The idea of the kiva in Anasazi archaeology. *Kiva* 53, 213-34.

Lowell, J.C., 1991. *Prehistoric Households at Turkey Creek Pueblo, Arizona*. Anthropological Papers 54. Tucson (AZ): University of Arizona Press.

Matthews, R.J., 1996. Surface scraping and planning, in *On the Surface. Çatalhöyük 1993–5*, ed. I. Hodder. Cambridge: Cambridge University, McDonald Institute for Archaeological Research, 79–100.

Matthews, W., & S. Farid, 1996. Exploring the 1960s surface – the stratigraphy of Çatalhöyük, in *On the Surface. Çatalhöyük 1993–5*, ed. I. Hodder. Cambridge: Cambridge University, McDonald Institute for Archaeological Research, 271-300.

- Mazzucato, C., 2016. Near urban living: Çatalhöyük and the late Neolithic megasites. *Norwegian Archaeological Review* 49, 65-9.
- Mellaart, J., 1964. A Neolithic City in Turkey. *Scientific American*, 94-104.
- Mellaart, J., 1967. *Çatal Hüyük: A Neolithic Town in Anatolia*. London: Thames and Hudson.
- Mellaart, J., 1970. *Excavations at Hacilar*. Edinburgh: Edinburgh University Press.
- Mills, B.J., 2014. Relational networks and religious sodalities at Çatalhöyük, in *Vital Matters: Religion at Çatalhöyük*, ed. Ian Hodder. Cambridge (MA): Cambridge University Press, 159-86.
- Mindeleff, V., 1891. A study of pueblo architecture in Tusayan and Cibola, in *Eighth Annual Report of the Bureau of American Ethnology, 1886-87*. Washington (DC): U.S. Government Printing Office, 3-228.
- Montgomery, R.G., W. Smith, & J.O. Brew, 1949. *Franciscan Awatovi: The Excavation and Conjectural Reconstruction of a 17<sup>th</sup>-Century Spanish Mission Establishment at a Hopi Indian Town in Northeastern Arizona*. (Papers of the Peabody Museum of American Archaeology and Ethnology 36.) Cambridge (MA): Harvard University, Peabody Museum.
- Moore, J. D., 1996. The Archaeology of Plazas and the Proxemics of Ritual: Three Andean Traditions. *American Anthropologist* 98(4), 789-802.
- Moore A.T, G.C. Hillman & A.J. Legge, 2000. *Village on the Euphrates: from foraging to farming at Abu Hureyra*. Oxford: Oxford University Press.
- Naroll, R., 1962. Floor area and settlement population. *American Antiquity* 27, 587-9.

- Ortman, S.G., A.H.F. Cabaniss, J.O. Sturm & L.M.A. Bettencourt, 2014. The pre-history of urban scaling. *PLoS ONE* 9:e87902.
- Ozdogan, M. & A. Ozdogan, 1989. Çayönü. *Paleorient* 15, 65-74.
- Peeples, M.A., 2018. *Connected Communities: Networks, Identity, and Social Change in the Ancient Cibola World*. University of Arizona Press, Tucson.
- Potter, J. M., 1998. The structure of open space in late prehistoric settlements in the Southwest, in *Migration and Reorganization: The Pueblo IV Period in the American Southwest*, ed. K. Spielmann. Tempe (AZ): Arizona State University Press, 137-164.
- Potter, J.M. & E.M. Perry, 2000. Ritual as a Power Resource in the American South west, in *Alternative Leadership Strategies in the Prehispanic Southwest*, ed. B.J. Mills. Tucson (AZ): University of Arizona Press, 60-78.
- Rappaport, R. 1971. Ritual, sanctity, and cybernetics. *American Anthropologist* 73, 59-76.
- Rautman, A.E., 2000. Population aggregation, community organization, and plaza oriented pueblos in the American Southwest. *Journal of Field Archaeology* 27, 271-83.
- Redman, C.L., 1978. *The Emergence of Civilization: From Early Farmers to Urban Society in the Ancient Near East*. San Francisco (CA): W. H. Freeman.
- Reed, L.S., C.D. Wilson, & K.A. Hays-Gilpin, 2000. From brown to gray: the origins of ceramic technology in the northern Southwest, in *Foundations of Anasazi Culture: The Basketmaker Pueblo Transition*, ed. P. F. Reed. Salt Lake City (UT): University of Utah Press, 203-20.

Reid, J. J., & S. Whittlesey, 1999. *Grasshopper Pueblo: A Story of Archaeology and Ancient Life*. Tucson (AZ): University of Arizona Press.

Rollefson, G.O., Z.A. Kafafi, & A.H. Simmons, 1992. Neolithic cultures at 'Ain Ghazal, Jordan. *Journal of Field Archaeology* 19(4), 443-470.

Rosen E. M., 1986. *Cities of Clay: The Geoarchaeology of Tells*. Chicago & London: University of Chicago Press.

Rosenberg, M., 2003. The strength of numbers: from villages to towns in the aceramic Neolithic of southwestern Asia, in *From Villages to Towns: Studies Presented to Ufuk Esin*, eds. M. Özdoğan, H. Hauptmann, & N. Baogelen. Istanbul: Arkeoloji ve Sanat Yayınları, 91–101.

Rosenberg, M., & A. Erim-Özdoğan, 2011. The Neolithic in southeastern Anatolia, in *The Oxford Handbook of Ancient Anatolia*, ed. G. McMahon & S. Steadman, 125-149.

Roth, B.J., 2016. *Agricultural Beginnings in the American Southwest*. Lanham (MD): Rowman and Littlefield.

Schachner, G., D. Gilpin, & M.A. Peeples, 2012. Alternative trajectories during the early Pueblo period in the Little Colorado drainage and beyond, in *Crucible of Pueblos: The Early Pueblo Period in the Northern Southwest*, eds. R.H. Wilshusen, G. Schachner, & J.R. Allison. (Monograph 71.) Los Angeles (CA): University of California, Los Angeles, Cotsen Institute of Archaeology Press, 101-26.

Shafer, H.J., 2006. Extended families to corporate groups: pithouse to pueblo transformation of Mimbres society, in *Mimbres Society*, eds. V.S. Powell-Martí & P.A Gilman. Tucson (AZ): The University of Arizona Press, 15-31.

Shane, O.C. III & M. Küçük, 1998. The World's First City. *Archaeology Magazine* 51(2), March/April.

Simmons, A., 2007. *The Neolithic Revolution in the Near East: Transforming the Human Landscape*. Tucson (AZ): University of Arizona Press.

Smith W., 1971. *Painted Ceramics of the Western Mound at Awatovi*. (Papers of the Peabody Museum of Archaeology and Ethnology 38.) Cambridge (MA): Harvard University, Peabody Museum.

Smith, M.E., J. Ur, & G. M. Feinman, 2014. Jane Jacobs' 'cities first' model and archaeological reality. *International Journal of Urban and Regional Research* 38(4), 1525-1535.

Spielmann, K.A. (ed), 1998. *Migration and reorganization: The Pueblo IV period in the American Southwest*. Arizona State University Anthropological Research Papers 51. Arizona State University, Tempe.

Soja, E.W., 2000. *Postmetropolis: Critical Studies of Cities and Regions*. Oxford: Blackwell.

Thissen, L., 2002. Time trajectories for the Neolithic in central Anatolia, in *Central Anatolian Neolithic e-Workshop: The Neolithic of Central Anatolia: Internal Developments and External Relations during the 9th-6th Millennia Cal B.C.*, eds. F. Gerard & L. Thissen. Istanbul: Ege Yayınları, 13-26.

Varien, M.D., & J.M. Potter (eds.), 2008. *The Social Construction of Communities: Agency, Structure, and Identity in the Prehispanic Southwest*. Lanham (MD): Altamira Press.

Verhoeven, M., 2006. Megasites in the Jordanian Pre-Pottery Neolithic B. Evidence for ‘proto-urbanism’, in *Domesticating Space: Construction, Community, and Cosmology in the Late Prehistoric Near East*, eds. E.B. Banning & M. Chazan. Berlin: ExOriente, 75-9.

Ware, J.A., 2014. *A Pueblo Social History: Kinship, Sodality, and Community in the Northern Southwest*. Santa Fe (NM): SAR Press.

Webb, J.M., & D. Frankel, 2004. Intensive site survey. Implications for estimating settlement size, population and duration in prehistoric Bronze Age Cyprus, in *Archaeological Field Survey in Cyprus. Past History, Future Potentials*, ed. M. Iacovou. (British School at Athens Studies 11) London: British School at Athens, 125–37.

## **Author Biographies**

**Wesley Bernardini** is the Farquhar Professor of the American Southwest at the University of Redlands. His research, conducted in collaboration with the Hopi Tribe, addresses migration, identity, and landscape in the pre-contact American Southwest. He is the author of *Hopi Oral Tradition and the Archaeology of Identity* and *Hopi History in Stone: The Tutuveni Petroglyph Site*.

**Gregson Schachner** is an associate professor at UCLA. His research interests include mobility and village formation in the American Southwest. He is the author of *Population Circulation and the Transformation of Ancient Zuni Communities* and co-editor of *Crucible of Pueblos: The Early Pueblo Period in the Northern Southwest*.

## Figure Captions

**Figure 1.** *Locations of Çatalhöyük and Awat’ovi.*

**Figure 2.** *a) Çatalhöyük Eastern mound showing excavated and open areas (redrawn after Düring 2006, Figure 6.32 book; Düring 2007:Figure 6; Matthews 1996 Figure 7.1, 7.5; and Hodder 2014:Figure 4. South area shows Mellart’s level VIB buildings, which are roughly but not precisely contemporary with North area and the smaller central area, which show architecture exposed by surface scraping. Smaller squares are also from surface scraping). b) Awat’ovi (map by authors, partly redrawn after Montgomery et al. 1949, Figure 3, and Gilpin in press, Figure 6.01). 1 meter contour interval in both maps.*

**Figure 3.** *Site size (in hectares) of Neolithic sites in the south-central Levant and historic pueblos from the American Southwest (data from Kuijt 2000, 81, table 1 and Dohm 1990, 211, table 3).*

**Figure 4.** *Boxplot of population estimates for Çatalhöyük and Awat’ovi (Çatalhöyük data from Cessford 2005, table 16.2).*

**Figure 5.** *Histogram of late prehistoric southwestern pueblo population size (data from Duwe et al. 2016, table 7 and Dohm 1990, 211, table 3).*

**Figure 6.** *Examples of large, late prehistoric southwestern pueblo layouts. a) Pueblo de los Muertos; b) Atsinna; c) Lower Deracho Ruin; d) Yellowhouse; e) Los Pilares; f) Bailey Ruin; g) Grasshopper Pueblo; h) Pecos Pueblo; i) Turkey Creek; j) Ponshipa’akedi’owingeh. (a-g redrawn after Peebles 2018, figure 7.3; h redrawn after Kidder 1958, figure 20; i redrawn after Lowell 1991, figure 2.3; j redrawn after Duwe et al. 2016, figure 5).*

**Figure 7.** a) Asikli Hoyuk (redrawn after Esin and Harmankaya 1999, Figure 3 and Düring 2006, Figure 4.10); b) Hacilar (redrawn after Mellart 1970, 71-2); c) Tell Bouqras (redrawn after Akkermans et al. 1981, Figure 2). Contour interval 5 meters in all maps.

**Table 1.** Size comparison of Çatalhöyük and Awat'ovi

Measurement	Çatalhöyük	Awat'ovi
Site area	13.5 ha	10.6 ha
Site length	475 m	420 m
Site width	325 m	250 m
Maximum height	17.5 m	8 m

**Table 2.** Timing of major archaeological transitions during the rise of agriculture in central Anatolia and the Tuscayan region

Region	First appearance of cultigens		Round/oval to rectangular architecture		Widespread use of pottery for cooking	
	Absolute	Relative	Absolute	Relative	Absolute	Relative
central Anatolia	8300 BC (Baird 2012:440)	-1200	7800 BC (Baird 2012:449)	-700	6700 BC (Fletcher et al. 2017)	400
Tuscayan region	1990 BC (Roth 2016:62)*	-3240	AD 825 (Schachner et al. 2012)	-425	AD 500 (Reed et al. 2000)	-750

\*Kohler and Reese (2014) date the appearance of "effective agriculture" in the Southwest to AD 500, 750 years before the founding of Awat'ovi



Figure 1

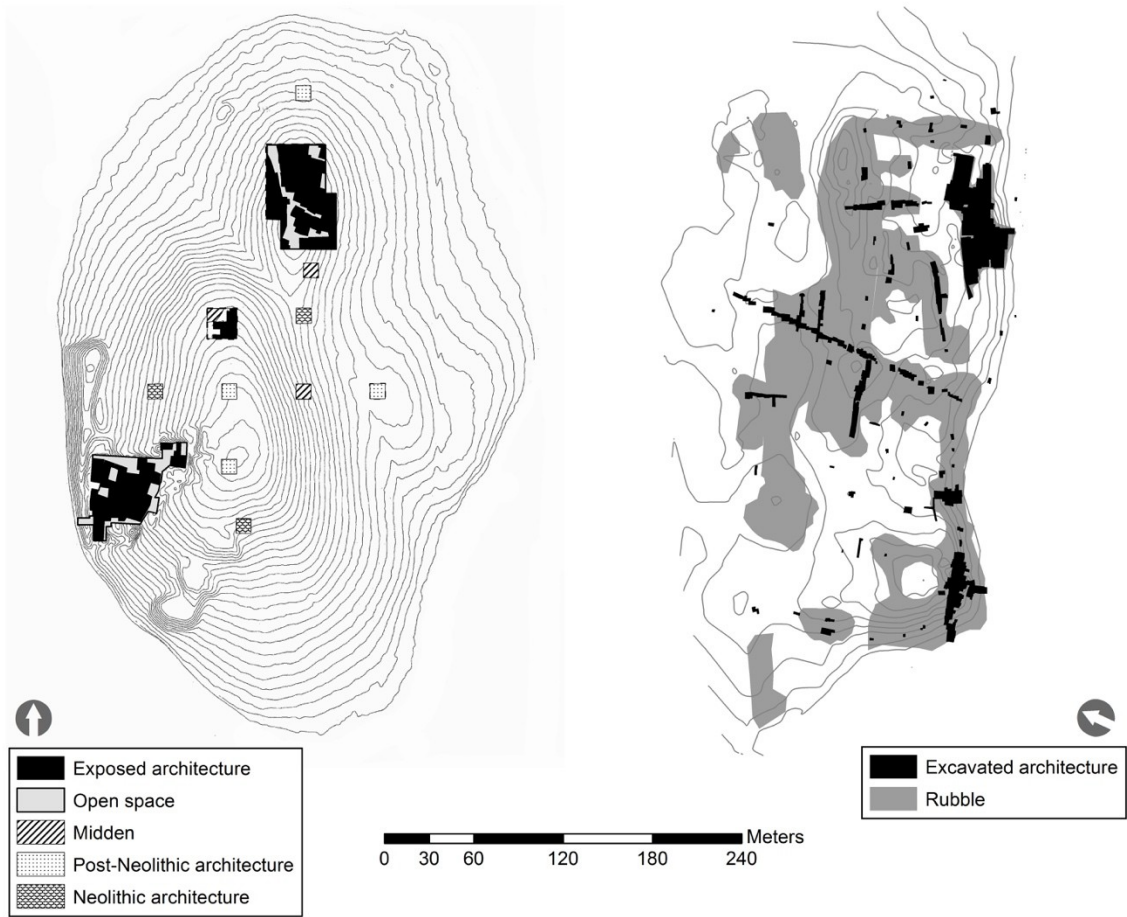


Figure 2

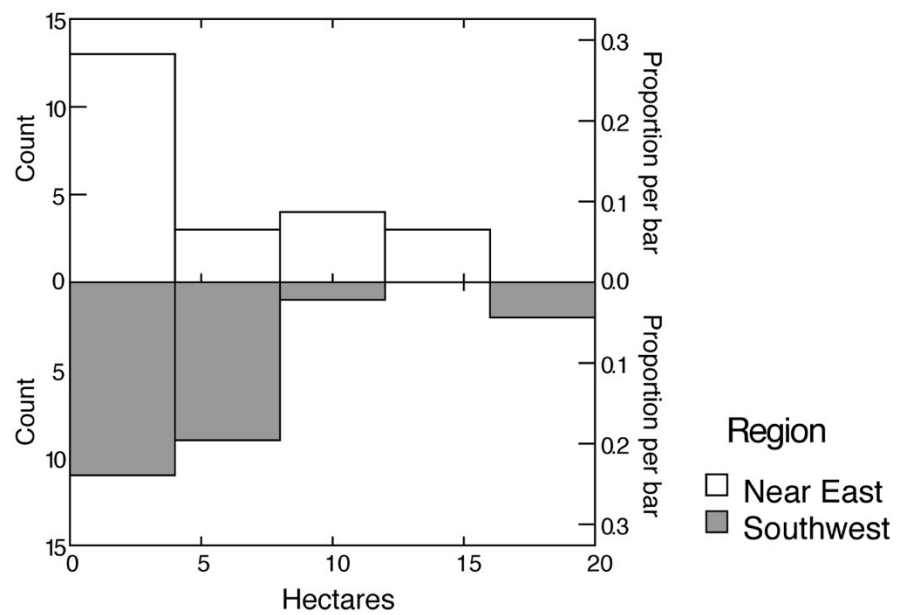


Figure 3

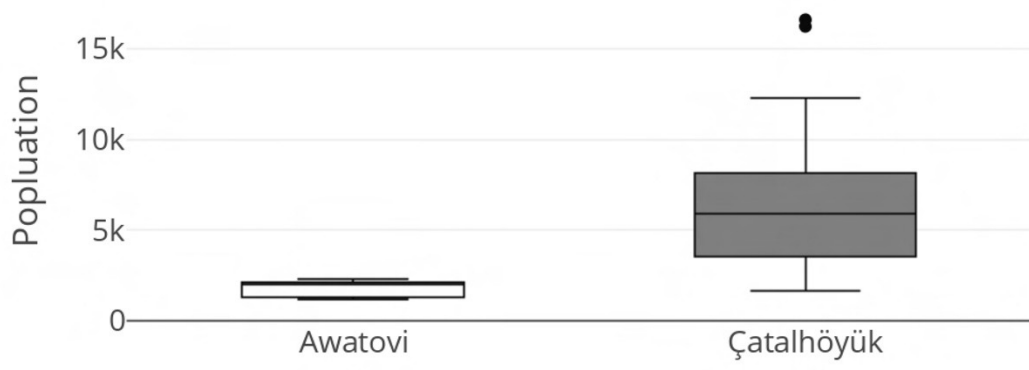


Figure 4

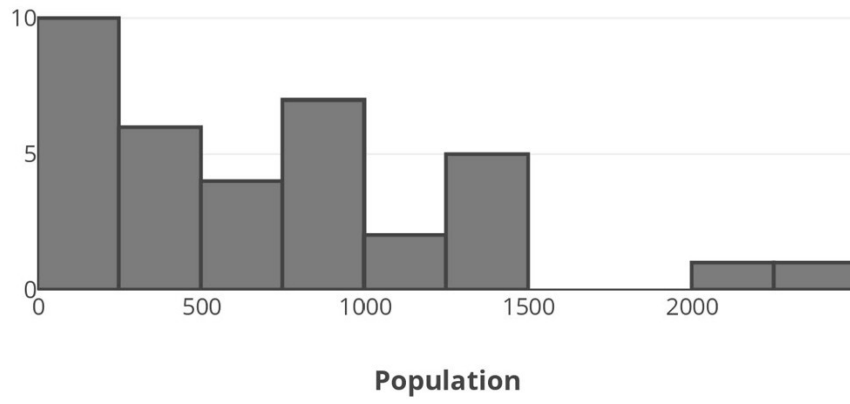


Figure 5

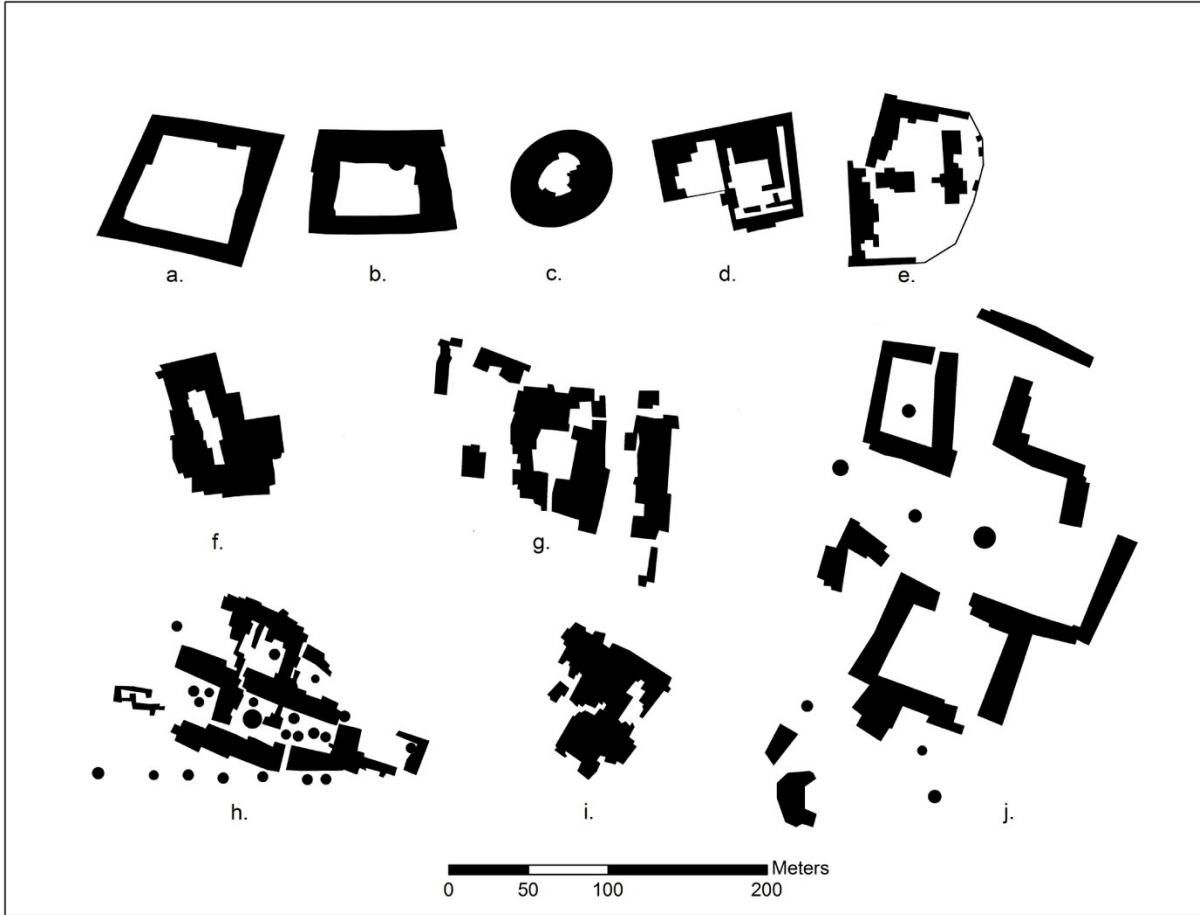


Figure 6



Figure 7