Building Quality of Life and Social Cohesion at Ucanha During the Terminal Preclassic

by

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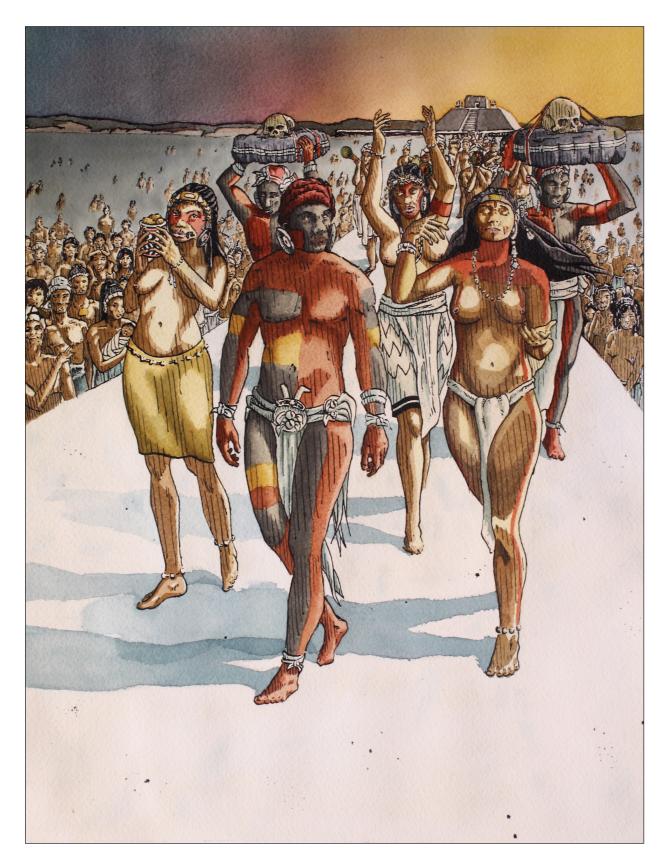
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Late Preclassic life in the Northern Maya Lowlands is a period of material and social experimentation, a balancing act between emerging social differentiation and an ideology of communal integration. During this period, the site of Ucanha was physically integrated into a micropolity via an 18-km-long roadway and experienced the creation of integrative civic spaces, a population apogee, and an influx of ceramic heterogeneity. Followers donated labor to build a monumental landscape, and incipient rulers provided an array of aesthetically pleasing ceramics and social events that helped forge collective trust. Ceramic distributions and the widespread use of megalithic architecture indicate a high quality of life for households. A built landscape that references a place of creation and stucco friezes and architecture attest to emergent claims of hereditary rulership and community prosperity. Evidence from Ucanha's central plaza indicate this area was more-widely accessed during the Late Preclassic but then became more restricted to the general public during the Early Classic. Likewise, during the Early Classic, the distribution of decorated ceramics became more circumscribed, indicating economic changes that favored gifting elites rather than provisioning the populace. During this period architecture associated with elite rulership was interred and households were abandoned. Thus, around the time of broader integration during the Late Preclassic, political institutions provided for all; yet, during the Early Classic, elites turned from an inclusive, community strategy towards a more exclusionary strategy of reinforcing an elite identity. As a result, leaders lost the support of their constituents and populations declined.

Keywords: household archaeology, quality of life, integration, causeways, social differentiation



Integration and Quality of Life

Processes of sociopolitical integration are negotiated by a variety of actors and at various scales of interaction. The relatively low-density, agrarian settlements of the Maya world simultaneously have centripetal and centrifugal forces that impact integration. Historically, perspectives were top-down-city-level or bottom-up-household-level, with the more middle-scale resolution of the neighborhood (Hutson 2016; Lemonnier 2012; Smith and Novic 2012) and the community (Hendon 2003; Yaeger and Canuto 2000) emerging as a heuristic rather recently. By comparing different scales of integration (i.e., household, community, and micro-regional), we discuss how components of the built environment and quality of life (QOL), or wellbeing, facilitated and constrained integration over time along an 18-km-long causeway that passed through four sites (Ucí, Kancab, Ucanha and Cansahcab) in Yucatán, México (Figure 1). Wellbeing was a process ne-



gotiated between the household and community levels of interaction as a result of emergent rulers trying to recruit and retain followers. In this paper we examine how different scales of settlement negotiated wellbeing during the Terminal Preclassic by using the distribution of megalithic architecture and decorated ceramics as a proximate measure of household wellbeing in conjunction with monumental construction and supra-household interactions as a measure of community prosperity. However, during the Early Classic, changes in access to public space and decorated ceramics indicate a decrease in wellbeing and prosperity.

The success of polity integration is rooted in how rulers and

followers meet one another's ecological, economic, and social needs. Among the ancient Maya, rulers typically provided protection, economic opportunities, and entertaining performances, while followers provided labor and tribute (Golden and Scherer 2013; Houston et al. 2003; Joyce 2008). Authority, therefore, rested in a moral obligation to fulfill expectations of QOL and promote a sense of trust among the community through "highly charged events, such as marketing, feasting, participation in royal spectacles...and collaboration in construction efforts... [that]...served to reinforce the sense of morality and trustworthiness (or un-trustworthiness) of individuals" (Golden and Scherer 2013:402). These ideas of trust-building and moral authority underscore that political success and QOL is a give-and-take relationship between rulers and followers.

The concept of QOL attempts to measure how rulers and followers alike negotiate wellbeing in ways that are bound by moral obligation. Smith (2015; see also 1987) argues household QOL can be measured in terms of wealth and capabilities. For Smith, wealth, or economic wellbeing, is measured by domestic architecture and durable, portable goods. Capabilities, on the other hand, strive to assess social or psychological wellbeing, which Smith (2015) argues is measured by the diversity of possessions and external social networks, such as exchange systems (i.e., foreign goods) and style networks (i.e., local goods that emulate foreign styles (Table 1). For example, a household with numerous spindle whorls would have higher capabilities because these possessions improve functionings, which are defined as "the various things a person may value doing or being" (Sen 1999:75). The capability approach moves beyond just the material and

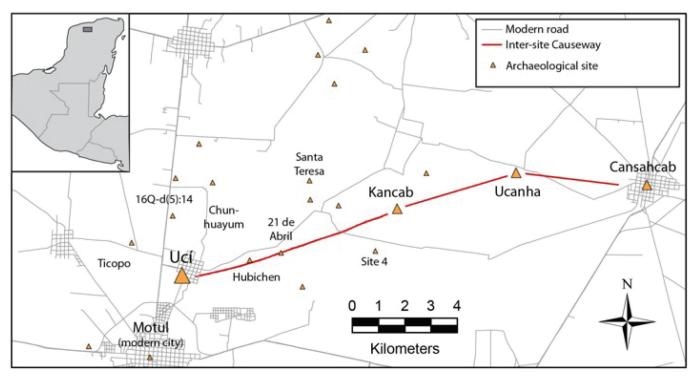


Figure 1. Map of the Ucí-Cansahcab causeway with sites demarcated by triangles. Map courtesy of Scott Hutson.

urges one to extend the artifact out to envision the social networks needed not only to procure and produce the artifact but also the ways in which a possession can help be a means to end. Deneulin and McGregor (2010:503) add that capabilities exist between structure and agency or the individual and society as a negotiated "living well together". Arponen et al. (2016), for example, convincingly argue that during the Late Neolithic the ability of one group to diminish access to rituals by another group had negative implications for capabilities and overall QOL

Table 1. Component of household and community wealth and capabilities adapted from Smith 2015.

	Wealth	Capabilities		
Household	Domestic ArchitectureDurable, Portable Goods	 Diversity of Possessions External Social Networks Domestic Feasting / Rituals 		
Community	• Sum of Household Wealth	 Collective Construction Projects Stability of Residence Population Growth Longevity of Settlement Resilience to External Shocks Collective Rituals 		

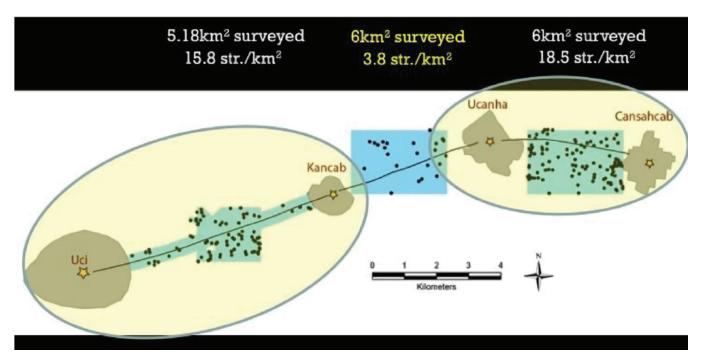


Figure 2. Map of hinterland residential platforms showing relatively low settlement density between Kancab and Ucanha.

At the community level, Smith (2015) uses the term prosperity, where wealth is the aggregate wealth of households and capabilities consist of collective construction projects, stability of residence, population growth, settlement longevity, and resilience to external shocks (Table 1). Since communities are (re)produced through face-to-face interactions, frequent interpersonal interactions of differentially situated actors reinforce generalized trust, which can promote social cohesion, reciprocity networks, and morally-embedded economic practices (Golden and Scherer 2013; Houston et al. 2003). As such, individual wellbeing and community success are intertwined processes that are negotiated between households and higher-scale political and economic institutions (Deneulin and McGregor 2010). Since enjoyment of social participation is a critical component of the capability approach (Arponen et al. 2016), we would also argue that the ability of a household or a larger political institution to provide opportunities for social engagement—whether through feasting, ritual processions, theatrical performances, etc.—would also indicate a higher range of capabilities at both the household and community levels. Therefore, it is imperative to consider how capabilities at different scales, such as the household and community, promote "living well together" (Deneulin and McGregor 2010:501).

Ucanha: Physical Integration and Emerging Micropolities

At the largest scale of integration, the Ucí-Cansahcab polity was physically connected during the Terminal Preclassic (75 BCE – CE 400; Glover and Stanton 2010) by an 18-km-long causeway (Figure 1). The causeway would have required significant labor inputs to construct and would have functioned as political symbol, or marker of identity, used to define polity boundaries (Kurjack and Andrews 1976). Furthermore, the causeway itself would have been a transformative

component of the built landscape for future generations as it physically connected new people thereby augmenting the scale of sociopolitical interactions.

Given the amount of labor input required to build this roadway, this monumental endeavor would have not only physically integrated the polity but would have also been a material reminder of its inter-personal integration, an embodiment of the micro-regional community on the

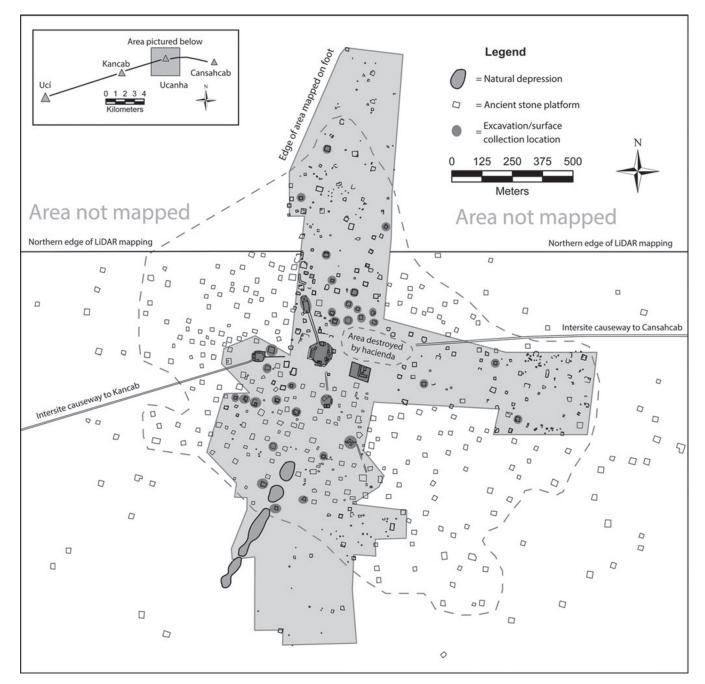


Figure 3. Map of Ucanha showing extent of intensive survey in light grey, locations of test excavations in dark grey, and proposed site edges based on LiDAR mapping.



Figure 4. Image of megalithic stones from the basal platform of a residential structure.

landscape (Hutson 2002; Pauketat 2000; Pauketat and Alt 2005). As a monumental construction it would have indexed an increased community prosperity. Once thought to be constructed solely at the behest of the regional center Ucí (Maldonado C. 1979, 1995), investigations at major centers and hinterland sites indicate the causeway was constructed in three episodes (Hutson et al. 2016). Data from excavations, survey, and LiDAR indicate Ucí and Ucanha were emerging micro-polities during the Late Preclassic, each undergoing massive monumental constructions at their respective centers with evidence of autonomous political authority (Hutson and Welch 2014). Here, the term polity includes a spatial boundary, a community of people formed through face-to-face interactions, and a seat of political authority (Marken and Fitzsimmons 2015:5). These construction projects would have been mechanisms for galvanizing local support and integrating the community (Ringle 1999). The area between Kancab and Ucanha is relatively sparsely occupied—only 3.8 structures/km² as compared to over 16 structures/km² between Ucanha and Cansahcab and Kancab and Ucí—suggesting it may have functioned as a buffer zone between Ucí and Ucanha (Figure 2). Thus, the intersite causeway was built in three segments with each episode highlighting elevated community prosperity and bolstering a sense of generalized trust through interpersonal interactions of people from various households.

The areal extent of Ucanha is 2.205 km² as mapped by LiDAR and pedestrian survey. In total we mapped 394 households—with a total estimated number of 416—yielding a settlement

density of 189 houses per km², the highest of all sites located on the intersite causeway (Figure 3). Ninety residential platforms were of the megalithic style, and these were more voluminous—thereby reflecting higher labor investments and more wealth—than non-megalithic platforms. The megalithic style of architecture consists of large rectangular limestone blocks with rounded corners that are roughly 60 cm in length (Figure 4) and dates roughly to the Terminal Preclassic (Mathews and Maldonado C. 2006; Taube 1995). Ceramic evidence recovered from monumental and residential contexts shows population peaks during the Late Preclassic and the Late Classic with a noticeable decline by the latter half of the Early Classic (\sim CE 400 – 600) as indicated by a lack of Yucatan Gloss wares and Oxkintok wares (see also Anderson [2011]). Of the 15 residential platforms test-pitted (Figure 5), 56.7% of the total identifiable ceramics dated to the Late

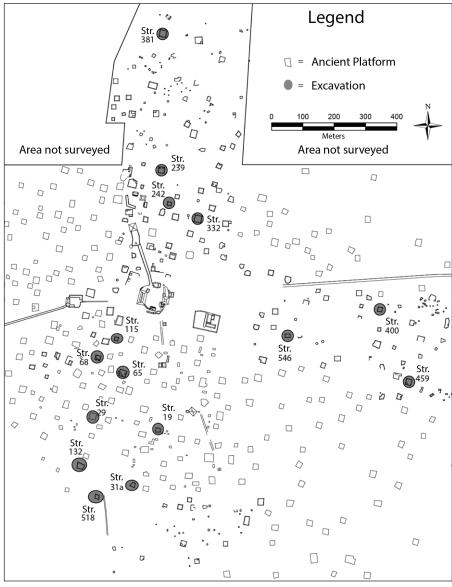


Figure 5. Map of Ucanha showing the fifteen residential architectural groups that were test-pitted.

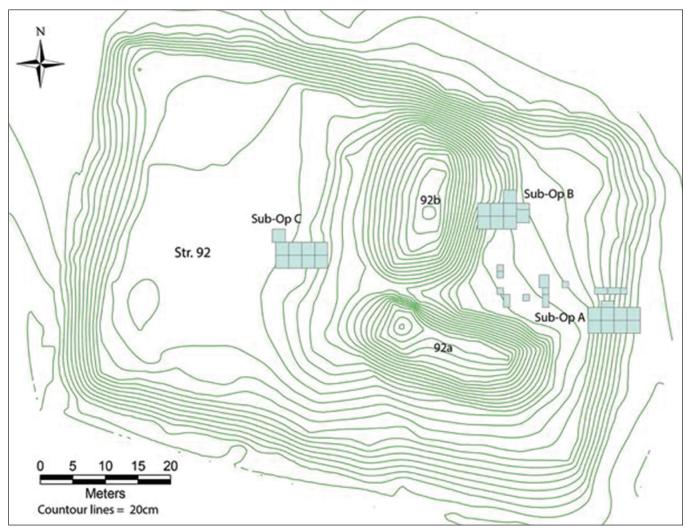


Figure 6. Map of Structure 92 with excavation units shown in grey.

Preclassic and 25.8% dated to the Late Classic. Eleven of the platforms that received off-mound test-pitting had a majority of sherds from the Late Preclassic, while the remaining five had a majority of Late Classic sherds. Surface collections overwhelmingly dated to the Late Classic, a trend at odds with ceramics from test pitting; therefore, these collections were not included in subsequent calculations. Ceramic evidence indicates the vast majority of Ucanha's built land-scape—including three pyramids over 8 m tall (Structures 147, 148, and 151); a series of intrasite *sacbeob* and associated termini groups (Structures 13, 150, and 120); and early iterations of a palace (Structure 92)—were in place by the end of the Late Preclassic. Finally, excavations from Structure 92 uncovered (Figure 6) the presence of a Terminal Preclassic substructure (92c-Sub-IV) that had exterior walls covered in stucco and painted in a red mat motif, which is an icon that is associated with rulership (Fash 1991; Justeson et al. 1985) (Figure 7a and 7b). Elsewhere we have argued this structure was an animate part of the landscape that protected and highlighted political authority (Hutson et al. in press). Interestingly, 92c-SubIV was carefully buried by the



Figure 7. Images of the outside of 92c-subIV showing walls covered in stucco and painted red with mat motif (a) and a close up of the red mat motif (b).

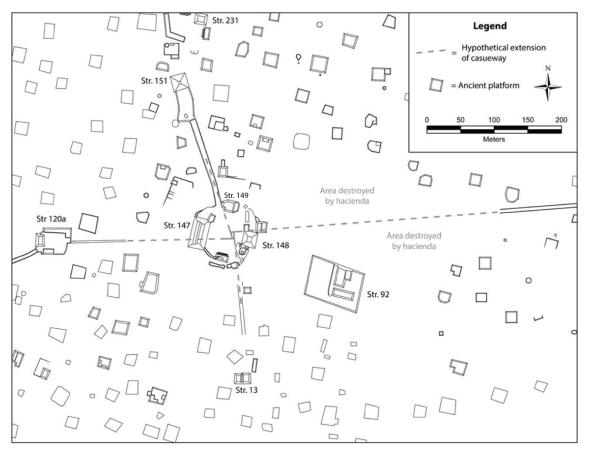


Figure 8. Map of the central portion of Ucanha showing causeways and termini structures. The causeways have been extended to show how they would converge in the central plaza.

end of the Terminal Preclassic (~CE 400), suggesting a loss of political autonomy. Nevertheless, by the end of the Preclassic, multiple monumental buildings had been constructed, the site population had reached its apex, and residential compounds had consumed diverse household ceramics, all of which attest to the communal prosperity of the site.

Sacred Landscapes: Community-Level Prosperity and Building Social Cohesion

During the Terminal Preclassic, Ucanha underwent major monumental construction episodes, which attests to prosperity at the community-level. Civic-ceremonial construction at this time across the Northern Lowlands was widespread and likely the result of emerging elites trying to "recruit and retain migrants" (Bey 2006:29); therefore, monumental construction projects during this time were a source of communal pride and a materialization of collective ideology (Glover and Stanton 2010; Ringle 1999; Ringle et al. 2014; see also Hutson 2002; Pauketat 2000). Ucanha's built landscape incorporated components of sacredness into the landscape, including four causeways converging towards the main plaza (Figure 8), which can be seen as an idealized representation of the Maya cosmos (Mathews and Garber 2004; Stanton and Freidel 2005; cf. Normark 2008, 2010). Excavations of these causeways and respective terminus groups indicate they were constructed during the Terminal Preclassic and were probably important integrative features associated with communal events, such as theatrical performances and pilgrimage fairs, that provided economic opportunities in addition to moments of sociality (Freidel 1981). All of these *sacbeob* terminate at structures with plaza areas that were built during the Late Preclassic, with the exception of the eastern *sacbe*, which likely had a terminus structure destroyed by a modern hacienda (Figure 9). These causeways likely facilitated ritual processions from the core to the periphery, which helped forge a wider sense of inclusion and trust through moments of *communitas* (see image facing title for an artist's reconstruction of a ritual procession along a sacbe at Ucanha; see also Ringle 1999).

The central plaza of Ucanha would be an ideal setting for a community-wide ritual since it could have fit the entire population (following Inomata 2006:812) and would be the axis mundi of a quincunxial site layout. Evidence from the central plaza suggests it was a more accessible space during the Late Preclassic—thereby facilitating integration of the general populace—how-ever, by the transition to the Early Classic, access to this area was restricted by a series of walls built around it. Excavations directly in front of an east-west pyramid complex—Str. 147 and 148 (Figure 8)—yielded ceramics and a radiocarbon sample (2,079 +- 43 years BP; 2 sigma 202 BCE – CE 18) from beneath a series of floors indicating this plaza was largely constructed during the Late Preclassic. Additionally, Str. 149 (Figure 8), which lies immediately to the east of the northern *sacbe* that runs to the tallest pyramid at Ucanha, contains a construction phase

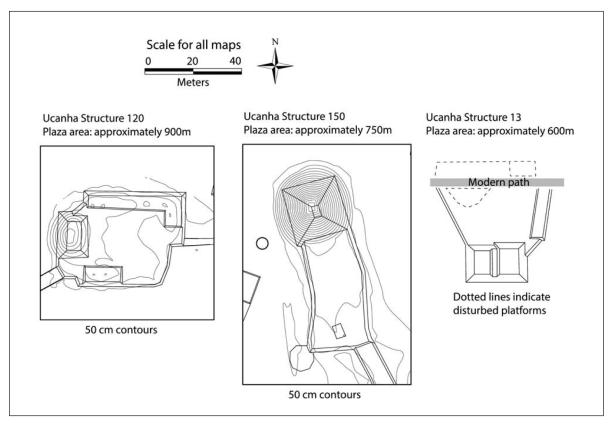


Figure 9. Terminus groups of Ucanha's roadways with estimated plaza areas. Map modified from Hutson and Welch 2014.

with a megalithic staircase that leads to the central plaza. This broad, flat structure would have likely functioned as theatrical focal point elevated 2.5 m over the plaza-filled crowd. While it is tempting to envision these monumental constructions, and the organized labor they represent, as aspirations to legitimize centralized authority, it is important to remember the laborers who donated their energy were not duped into doing so, but rather were taking part in a social process of integration that only later possibly became a material component of "naturalized" hierarchy (Pauketat 2000; Ringle 1999). Yet, the construction of a wall around the central plaza toward the end of the Preclassic indicates this space became less accessible to the general populace. Around the same time, Izamal emerges as a regional superpower, possibly covering an area over 53 km² (Hutson 2012; Millet Cámara 1999), and 92c-SubIV is buried, indicating a loss of political autonomy at Ucanha.

Quantifying Household Quality of Life Through Gini Coefficients

Households are not autonomous but are linked together through economic, political, and ecological relations and can influence the broader political success of a community. Moreover, the household is one the most salient components of identity where successful integration into the larger community means satisfactory levels of wellbeing must be sustained for broader sociopolitical prosperity. As such, inter-household inequalities, which can accompany broader political-economic changes, can be a point of tension that threaten community success (Brumfiel 1994; Joyce 2008). Since other artifact classes such as obsidian and jade are, to date, largely absent from households at Ucanha, we use ceramic assemblages and architectural elaborations as proxies for QOL. While attempts to reconstruct QOL in the past will inherently be incomplete and part of wellbeing is experiential and subjective, recent methods strive to quantify aspects of social distinction. This methodological approach is useful because it (1) helps connect empirical data and high-level theory through testable models (Smith 2011) and (2) allows data sets to be compared across time, space, and degree of social complexity (Oka et al. 2018; Peterson and Drennan 2018; Smith et al. 2018). One method of quantifying access to resources is calculating Gini coefficients. A Gini coefficient measures the degree of concentration of a given unit among the population where a coefficient of o would indicate complete equality of distribution (all households have the same amount of a given unit) and a coefficient of 1 would indicate complete inequality of distribution (one household would have all of that given unit). One way to calculate a Gini coefficient is the "spreadsheet method" (Chase 2017). Common archaeological constructions of Gini coefficients include measuring architectural volume and surface area, domestic artifacts, and burial goods (Smith et al. 2018:Figure 1.2).

Megalithic Architecture as Quality of Life

The use of megalithic stones is a hallmark of the greater Ucanha area as well as an indicator of greater household quality of life as it would have required extra-household networks to procure, shape, and transport. Megalithic architecture would have also been a measure of wealth according to Smith's construct of household QOL. The construction of megalithic structures would have integrated people through the "sociality of stone" at the intimate, albeit comparatively short-lived, level of intra-household interactions (Hutson and Davies 2015). These individual

stones—weighing between 1250 and 2700 kilograms per m³ according to experimental studies (Sidrys 1978)—would require the coordinated movement between two or more laborers, a practice that would strengthen intra-household, and possibly inter-household, relations (Hutson and Davies 2015:14-15).

In Mesoamerica, architectural investment has been used as a proxy for a household's ability to mobilize labor and resources and, as such, an indicator for wealth and social distinction (Abrams 1994; Carmean 1991; Feinman et al. 2018; Hirth 1993; Hutson 2010; Kowalewski et al. 1992; Smith 1987). More specifically, recent investigations have calculated Gini coefficients as a method to quantify these energetic differences (Chase 2017;



Feinman et al. 2018; Hutson 2016). In an attempt to quantify household QOL, we calculated the Gini score for volume and surface area of 11 platforms (Figure 4, excluding structures 19, 29, 400, and 518), all of which had megalithic architecture and at least 35% of each platform's ceramics dated to the Late Preclassic. At Ucanha, the Gini score for volume was 0.480, which serves as a proximate measure for the ability to mobilize labor. Since cross-cultural comparisons of households show larger living spaces also positively correlate with wealth (Netting 1982; Reid and Whittlesey 1982; Wilk and Rathje 1982), Gini scores for surface area were also calculated for these 11 platforms (0.38). To put these numbers in context, intensive agriculturalists in non-urban settlements had a mean Gini score of 0.57 for overall distribution of wealth (ranging from 0.45 – 0.71; Smith et al. 2010). In other studies across Mesoamerica (Chase 2017:Table 2), Gini scores for living area ranged from 0.10 – 0.71 (mean 0.32) and from 0.19 – 0.63 (mean 0.34) for architectural volume. Thus, compared to other sites in Mesoamerica, Gini scores for architecture at Ucanha were above average, indicating that the built environment at the household scale was a node of inequality.

Ceramic Diversity as Quality of Life

In the absence of diverse household assemblages indicating broader capabilities (e.g., craft production tools or long-distance commodities), access to a variety of decorated ceramics can be used to quantify household wellbeing. For example, greater access to visually ostentatious serving wares, such as painted pottery, can indicate an elevated wealth and QOL because these households have the material ability to host more rituals, such as extra-household feasts, and these would require the ability to garner substantial resources such as foodstuffs, labor to prepare and cook meals, and costly ceramic wares (Fry 2003; Smith 1987:313). Paint and other surface treatments also add to a labor theory of value as seen in the production step measure (Feinman et al. 1981). Indeed, during the Terminal Preclassic, Glover and Stanton (2010:72) propose five ceramic spheres emerged vis-à-vis "from growing populations attempting to differentiate themselves in a social environment marked by increasing stratification."

Since the capabilities component of QOL is quantified by the diversity of possessions in and access to external social networks, we argue that calculating Gini coefficients for ceramic distribution can help quantify QOL across time. If "higher levels of artifact diversity point to a higher quality life" (Smith 2015:4) then measuring access to different varieties of finely-made, decorated ceramics can help quantify wellbeing. These decorated types include bichromes (Huachinango,

Dzilam Verde, and Carolina); cream slipped wares from the Peten (Flor); numerous Xanaba types with surface treatments and/or zoned bichrome slips (Caucel, Dzalpach, Kana, Chuchen, and Pixoy); similar types within Sierra (Laguna Verde and Altamira); and red-to-yellow-to-or-ange slips wares such as Shangurro and Iberia Ixcanrio. During the Late Preclassic, all but one of the 15 households had access to at least one type of bichrome or imported decorated ceramics. Indeed, the average number of different decorated ceramic types is 3.27 (s = ± 2.054) for households that had at least 35% of ceramics dating to this period.

In order to analyze ceramic distribution from the Late Preclassic to the Early Classic, we also compiled the number of distinct bichrome varieties and the percentage of bichromes per household assemblage for the Late Preclassic and compared these to the number of distinct polychrome varieties for the Early Classic. Households with greater number of bichrome varieties have greater QOL since diversity of possessions within an artifact class and stylistic breadth equates to elevated capabilities. Some structures (19, 29, 400, and 518) were ephemerally occupied during the Late Preclassic (<5% of the ceramics), so they were excluded. During the Late Preclassic, presence/absence of bichrome varieties yielded a Gini coefficient of 0.0960 suggesting households had relatively equal access to a number of decorated ceramics. The distribution of bichromes percentages was more uneven, however, with a Gini coefficient of 0.502, suggesting household QOL was not equal with regard to the proportion of decorated ceramics. Nevertheless, nearly every platform occupied during the Late Preclassic had access to decorated bichromes.

Furthermore, the relatively elevated access of Huachinango and Shangurro at Ucanha and throughout the greater region index external networks (i.e., capabilities) with Ek Balam and Izamal, which are, respectively, possible production locales of these bichromes (Bey et al. 1998; Dzul Gongora et al. 2017; Plank et al. 2018). Looking at the percentage of non-monumental contexts (Table 2), over 83% of households in hinterland settlements and roughly the same percentage at the major sites of Ucanha and Ucí have access to Shangurro. Households at Ucanha also have greater access to Huachinango as well as Dzilam, which indicates higher capabilities and, therefore, a higher QOL than other settlements along the causeway. If a variety Shangurro was produced around Izamal, as preliminary X-ray diffraction studies indicate (Dzul Gongora et al. 2017; Plank et al. 2018), this wide distribution would suggest broader political and economic ties to Izamal. Given the scope of access throughout the region, Shangurro's distribution possibly occurred through some incipient market exchange (see also Hutson in press).

This trend of near-universal access to decorated ceramics, however, is almost completely inverted in the distribution of Early Classic polychromes (i.e., Dzidzibachi, Tituc, Timucuy, Aguila, and Dos Arroyos), which had a Gini coefficient of 0.851, a score indicating a highly unequal distribution. By the Early Classic, only six of the 15 households had access to decorated polychrome ceramics. While higher diversity counts in the Late Preclassic are probably the result of ceramic heterogenization in the Northern Lowlands in general during this time (Glover and Stanton 2010), it is clear that by the first couple of centuries into the Early Classic the allocation of decorated ceramics is more circumscribed than previous periods. Some authors (Glover and Stanton 2010; Reese-Taylor and Walker 2002) claim the narrower distribution of Early Classic polychromes is the result of elite gift-giving economic transactions that tried to solidify alliances. Given the expansion of Izamal's sociopolitical power during this period, local elites at Ucanha might have strategically disseminated polychromes to reinvigorate sociopolitical ties

with wealthier households.

Therefore, by the Terminal Preclassic the overall prosperity of Ucanha, as measured by the sum of household QOL, appears relatively high. At the household level, capabilities as manifested by ceramic diversity appears relatively equal with regard to bichromes, but the overall access to different ceramic varieties and the style networks represented therein suggest that materializations of social distinction and variations of QOL were present during the Late Preclassic. With the introduction of Early Classic polychromes, ceramic materializations of social distinctions become pronounced as the distribution of fine ceramics becomes more circumscribed to fewer households thereby diminishing household QOL.

Table 2. Percentage of households with access to bichrome ceramics from two largest sites (Ucanha and Ucí) and a hinterland occupation on the intersite causeway.

	Carolina (% of contexts with access)	Dzilam (% of contexts with access)	Huachinango (% of contexts with access)	Shangurro (% of contexts with access)
Ucanha (n =11)	45.45%	81.82%	81.82%	90.91%
Ucí (n = 18)	27.78%	50%	61.11%	72.22%
Hinterlands (n = 12)	0%	0%	41.76	83.33%

Conclusion

The material end-results of integration are the culmination of negotiation between ruler and subjects alike: as Joyce (2008:223) states, "The outcome of the negotiation of power may bolster the social position of nobles, but it usually does so in ways that reflect some degree of compromise resulting from the interactions of varied social actors." This integration, furthermore, would have happened through more frequent, intimate interactions of the household compared to the more sporadic, yet grandiose scale of community-wide interactions. At Ucanha during the Late Preclassic, population booms, while large construction projects, community-wide processions, and relatively even household QOL all facilitated integration. However, by the middle of the Early Classic there are signs of decreasing QOL as populations decline, household access to decorated ceramics diminishes, and Structure 92c-subIV is buried. The central plaza of Ucanha also becomes less accessible by the conclusion of the Preclassic, suggesting it no longer functioned as a place of community-wide interaction. Throughout the project area, the Late Preclassic appears to be a time of elevated community prosperity and household QOL that falters during the Early Classic as moral authority is undermined by changing strategies of polity integration.

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