Ceramics provide insights into trading in ancient Peru

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Canchas Uckro was one of many smaller settlements that surrounded Chavín de Huántar, a 3,000-year-old settlement in western Peru. Researchers discovered that Canchas Uckro was independent from Chavín de Huántar and had closer ties to other local communities.

Ancient pottery fragments are helping Tulane University researchers understand how early communities connected with each other.

Their new study of 3,000-year-old ceramics from ancient Peru suggests one settlement may have had a wider trading network than previously thought, reshaping archaeologists' understanding of trade and cultural networks in the

region.

A team of researchers led by Rachel Johnson, a PhD candidate in the School of Liberal Arts, used advanced imaging techniques to determine the origins of ceramic fragments from the site of Canchas Uckro, one of many smaller settlements that surrounded Chavín de Huántar, a 3,000-year-old settlement in western Peru. The exact relationships among these settlements, however, are still a mystery to archaeologists.

When the researchers examined the materials and techniques used to make these ceramics, they learned that Canchas Uckro was independent from Chavín de Huántar and had closer ties to other local communities. That was a somewhat surprising result because of how influential Chavín de Huántar later became in the region.

“All the data instead seem to support the notion that Canchas Uckro was possibly participating in a distinct, more easterly oriented social network during that time period,” said Johnson.

Ceramics are among the most important artifacts for archaeologists because they are incredibly durable and are found in cultures around the world, according to Johnson.

“Ceramics are both a technological and a social product, meaning that specific ways of making things, from paste recipes, vessel shaping procedures, to firing conditions, were passed down over time through generations of shared learning,” said Johnson. For instance, she said, ceramics can give archaeologists insight into trade, migration and social networks.

“Studying these sites not only clarifies specific questions surrounding how people lived in the past but helps archaeologists understand the social and economic processes that enabled Chavín de Huántar to become such an important site,” she said.

For this study, Johnson and her colleagues focused on determining the origins of the raw materials from which the ceramics were made. They relied on multiple methods, including a microscope that shines light on the surface of the pottery. That method allowed the team to see how much variation there was in the materials used to make the ceramics. Then they employed another microscope that passed light

through very thin slices of pottery. That technique, called thin-section petrography, is one of the most effective ways to characterize the rocks and minerals within ceramics.

The final step was to perform a geochemical analysis, called pXRF, on the clay, which involves shining high-energy X-rays onto the samples. The X-rays cause the atoms in the clay to emit energy, which researchers can analyze to figure out precisely what elements make up the clay. That information was then compared among the samples to find outliers, pieces of pottery that were made of different raw materials than the majority and may have come from farther away.

Because one method looks at the clay and the other examines the small rocks and minerals that are found within the clay, Johnson said, “These methods ... give a complete picture of the raw materials used to make ceramics.”

The material analysis was paired with an analysis of the designs on the pottery. Similar designs typically indicate a connected social network between places, either through trade or through craftspeople teaching one another their techniques.

“Multi-method approaches are becoming the norm to study archaeological ceramic assemblages,” said Johnson.

As more archaeologists use a combination of methods, as Johnson and her colleagues have, new discoveries about ancient civilizations could be right around the corner, she said.