

From local to long-distance: Neolithic and Bronze Age ceramic networks in north-western China

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Sampling strategies and analysis techniques

Thin sectioning of the selected samples was carried out at the China Geology Museum's Ceramic Petrography Workshop in Beijing. Analysis and point counting of the Siwashan samples took place at the Shandong University Ceramic Analysis Laboratory using a transmitted light microscope and manual point counting stage, while the same analysis techniques were applied to the Majiayao site samples at the Stanford University Ceramic Analysis Laboratory using a similar microscope and a Petrog Automatic Point Counting Stage. Point counting took place following techniques described by Stoltman (1989, 1991, 2001), while qualitative analysis followed methodology laid out in Quinn 2013.

For the Siwashan samples, between 150 and 250 points were counted at 1 mm increments, with variation depending on the physical size of the sample. For the Majiayao sherds, two hundred points were counted on each sample along a grid auto-produced by the Petrog software suite. In both analysis methods, no point was counted twice. Generally, the samples contained homogeneous distributions of inclusions, and thus 200 points were seen as a suitable median of Stoltman's suggested 100-300 points per sample (Stoltman 2001). Each point was recorded as either matrix, inclusion, or void, with void type and size as well as inclusions size, roundedness, and type being recorded (see Figure 3). Paste groups were developed based on these metrics, with group names relating to the dominant inclusions. Raw data and images from this analysis will be housed on the opensource China Ceramic Petrography Database (Womack & Hein 2018).

Raw data was formatted and analysed in Microsoft Excel, with grain sizes being classified according to the suggested categories of silt (<0.0625 mm), fine sand (0.0625–0.25 mm), medium sand (0.25–0.5 mm); coarse sand (0.5–1.0 mm), and very coarse sand (>1.0 mm) (Stoltman 2001). Analysis of local clay and sand revealed the presence of both naturally occurring clay pellets and carbonate inclusions in some samples, as well as angular quartz and feldspar inclusions in other samples (Womack 2017; Dammer 2021); thus, we were unable to determine whether such inclusions in ceramic samples were natural features of the clay or whether they were intentionally added. Accordingly, we did not separate inclusions above 0.0625 mm based on whether we thought they were natural, or human added. Finally, all quantitative data was imported into the JMP software suite for analysis and visualization.

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Table S1: Petrographic sample information.

Sherd ID	Site	Cultural Period	Sample Number	Location	Sherd Type	Surface Treatment	Paste Group
AA001	Siwashan	Majiayao	1	15LS-V-H1	Body	Polished+Slip+Black Paint	Fine Paste
AA002	Siwashan	Majiayao	2	15LS-V-H1	Rim	Polished+Slip+Black Paint	Fine Paste
AA003	Siwashan	Majiayao	3	15LS-V-H1	Body	Cord Mark	Feldspar-Quartz
AB002	Siwashan	Majiayao	4	15LS-V-H2	Body	Crossed Cord	Feldspar-Pellet
AB005	Siwashan	Majiayao	5	15LS-V-H2	Body	Crossed Cord	Feldspar-Quartz-Biotite
AB006	Siwashan	Majiayao	6	15LS-V-H2	Body	Polished+Slip+Black Paint	Fine Paste
AC003	Siwashan	Majiayao	7	15LS-V-H3	Body	Polished+Slip	Clay Pellet
AC009	Siwashan	Majiayao	8	15LS-V-H3	Body	Cord Mark	Feldspar-Pellet
AC013	Siwashan	Majiayao	9	15LS-V-H3	Body	Cord Mark+Applique	Feldspar-Quartz-Biotite
AC014	Siwashan	Majiayao	10	15LS-V-H3	Body	Cord Mark+Applique	Feldspar-Quartz
H5-2-001	Majiayao	Qijia	1	2015GLM-H5-2 上午	Body	Basket Marks	Clay Pellet
H5-2-002	Majiayao	Qijia	2	2015GLM-H5-2 上午	Body	Basket Marks	Clay Pellet
H5-2-003	Majiayao	Qijia	3	2015GLM-H5-2 上午	Body	Basket Marks	Feldspar-Quartz
H5-2-004	Majiayao	Qijia	4	2015GLM-H5-2 上午	Body	Basket Marks	Fine Paste
H5-2-005	Majiayao	Qijia	5	2015GLM-H5-2 上午	Body	Basket Marks	Clay Pellet
H5-2-006	Majiayao	Qijia	6	2015GLM-H5-2 上午	Body	Basket Marks	Clay Pellet
H5-2-007	Majiayao	Qijia	7	2015GLM-H5-2 上午	Body	Basket Marks	Clay Pellet

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H5-2-008	Majiayao	Qijia	8	2015GLM-H5-2 上午	Rim	Fiber Point Cord Mark	Carbonate-Feldspar-Quartz-Amphibole-Biotite
H5-2-009	Majiayao	Qijia	9	2015GLM-H5-2 上午	Body	Fiber Point Cord Mark	Carbonate-Feldspar-Quartz
H5-2-010	Majiayao	Qijia	10	2015GLM-H5-2 上午	Body	Fiber Point Cord Mark	Schist-Carbonate-Quartz-Feldspar
H5-2-011	Majiayao	Qijia	11	2015GLM-H5-2 上午	Body	Fiber Point Cord Mark	Feldspar-Quartz
H5-2-012	Majiayao	Qijia	12	2015GLM-H5-2 上午	Body	Fiber Point Cord Mark	Carbonate-Feldspar-Quartz-Biotite-Calcite
H5-2-013	Majiayao	Qijia	13	2015GLM-H5-2 上午	Body	Fiber Point Cord Mark	Carbonate-Feldspar-Quartz
H5-2-014	Majiayao	Qijia	14	2015GLM-H5-2 上午	Body	Fiber Point Cord Mark	Carbonate-Feldspar-Quartz-Biotite-Calcite
H5-2-015	Majiayao	Qijia	15	2015GLM-H5-2 下午	Body	Basket Marks	Clay Pellet
H5-2-016	Majiayao	Qijia	16	2015GLM-H5-2 下午	Body	Basket Marks	Clay Pellet
H5-2-017	Majiayao	Qijia	17	2015GLM-H5-2 下午	Body	Basket Marks	Clay Pellet
H5-2-018	Majiayao	Qijia	18	2015GLM-H5-2 下午	Body	Basket Marks	Clay Pellet
H5-2-019	Majiayao	Qijia	19	2015GLM-H5-2 下午	Rim	Fiber Point Cord Mark	Carbonate-Feldspar-Quartz
H5-2-020	Majiayao	Qijia	20	2015GLM-H5-2 下午	Body	Fiber Point Cord Mark	Carbonate-Feldspar-Quartz-Amphibole-Biotite

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H5-2-021	Majiayao	Qijia	21	2015GLM-H5-2 下午	Body	Fiber Point Cord Mark	Carbonate-Feldspar-Quartz
H5-2-022	Majiayao	Qijia	22	2015GLM-H5-2 下午	Rim	Fiber Point Cord Mark	Carbonate-Feldspar-Quartz
H5-2-023	Majiayao	Qijia	23	2015GLM-H5-2 下午	Body	Fiber Point Cord Mark	Schist-Carbonate-Quartz-Feldspar
H5-2-024	Majiayao	Qijia	24	2015GLM-H5-2 下午	Body	Fiber Point Cord Mark	Carbonate-Feldspar-Quartz
H5-2-025	Majiayao	Qijia	25	2015GLM-H5-2 下午	Body	Fiber Point Cord Mark	Carbonate-Feldspar-Quartz
H5-2-026	Majiayao	Qijia	26	2015GLM-H5-2 下午	Body	Fiber Point Cord Mark	Carbonate-Feldspar-Quartz
H5-2-027	Majiayao	Qijia	27	2015GLM-H5-2 下午	Body	Fiber Point Cord Mark	Carbonate-Feldspar-Quartz-Amphibole-Biotite
H5-2-028	Majiayao	Qijia	28	2015GLM-H5-2 下午	Body	Basket Marks	Clay Pellet
H5-2-029	Majiayao	Qijia	29	2015GLM-H5-2 下午	Body	Basket Marks	Carbonate-Feldspar-Quartz
H5-2-030	Majiayao	Qijia	30	2015GLM-H5-2 下午	Body	Basket Marks	Fine Paste
H5-2-031	Majiayao	Qijia	31	2015GLM-H5-2 下午	Body	Basket Marks	Clay Pellet
H5-2-032	Majiayao	Qijia	32	2015GLM-H5-2 下午	Body	Basket Marks	Clay Pellet

