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# Shared Intentionality Shapes Humans' Technical Know-How

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Abstract:

Osiurak and Reynaud argue that cumulative technological culture is made possible by a "non-social cognitive structure" (p. 4) and they offer an account that aims "to escape from the social dimension" (p. 5) of human cognition. We challenge their position by arguing that human technical rationality is unintelligible outside of our species' uniquely social form of life, which is defined by shared intentionality (Kern & Moll, 2017; Tomasello, 2019).

Shared Intentionality Shapes Humans' Technical Know-How

Osiurak and Reynaud argue that cumulative technological culture (CTC) is made possible by a "non-social cognitive structure" (p. 4) enabling humans to acquire technical knowledge and skills. They maintain that CTC "is necessarily based on our extensive *individual cognitive ability* [our emphasis] to acquire and improve techniques" (p. 5), and they offer an account that aims "to escape from the social dimension" (p. 5) of human cognition. The implication seems to be that social cognition is not necessary for humans to develop fundamental technical skills.

We believe that an escape from human sociality cannot succeed because the social nature of human intelligence permeates all aspects of human cognition and cumulative culture. Human technical and instrumental rationality are unintelligible outside of our species' uniquely social form of life, which is defined by shared intentionality (Kern & Moll, 2017; Tomasello, 2019). We will deliver two points to make our argument. The first point casts doubt on Osiurak and Reynaud's thesis that humans' "technical potential" is fundamentally a feature of individual intentionality and instead suggests that humans' technical know-how is rooted in acts of shared intentionality. The second point is methodological. We will argue that the micro-society experiments Osiurak and Reynaud cite in support of their position do not constitute compelling evidence in favor of the asocial origins of technical knowledge and understanding.

The first point is informed by cognitive developmental psychology. Studies suggest that children do not develop their technical know-how by trial and error or solipsistic hypothesis testing. Instead, their instrumental rationality is shaped in acts of shared agency with competent adults who show them how to use and craft tools and address instrumental problems (Call & Tomasello, 1995; Moll, 2018). Let us give two examples. It has been established that young children have difficulties to consider water as a tool. When asked—in the absence of any solid tools but in the presence of water—to extract a small object from the bottom of a narrow and deep tube, preschoolers do not come to think of the possibility of pouring water into the tube

to make the object float atop (Hanus, Mendes, Tennie, & Call, 2011; Moll, 2018). However, when the instrumental usefulness of water is pedagogically introduced to them, most children spontaneously identify the solution and extract the buoyant object by releasing water into the tube (Moll, 2018). Another example is provided by young children's tendency to "over-imitate", even when the mechanical structure of a device is entirely transparent (Lyons, Young, & Keil, 2007; McGuigan, Whiten, Flynn, & Horner, 2007). When shown irrelevant in addition to relevant action steps in the course of a transparent apparatus' manipulation, most children faithfully imitate the entire procedure, including the irrelevant steps. If humans' technical abilities can be explained by a "non-social cognitive structure", as Osiurak and Reynaud claim, then it would seem that children should be immune to over-imitation and selectively reproduce only the relevant steps. The fact that most children faithfully stick to the adult's demonstration testifies to the significance of social trust in epistemic and technical matters. This trust is rational because in a social world replete with arbitrary conventions, symbolic communication, rituals, and common occurrences of "causation at a distance", it is often too difficult to determine for individual young learners why, or how, something is causally effective.

The second point concerns Osiurak and Reynaud's claim that micro-society studies prove that individuals can "reverse-engineer" artefacts without any social assistance. Granted, adult individuals can, under certain conditions, deduce the production process of certain artefacts simply by inspecting the end product. But it is doubtful that these individuals would be able to reverse-engineer anything without an extended social learning history in which they were introduced to the use and manufacturing of various tools and other artefacts. Imagine someone with a history like that ascribed to Kaspar Hauser. It is unlikely that this person could individually make out the function of, say, a can opener. Humans' social learning experiences shape their grip on how artefacts are constructed. Because micro-society experiments cannot control for the participants' social biographies, their validity as measures of what can be

attributed to individual versus shared intentionality is dubitable. In fact, it can be difficult even for adults with normal socialization histories to individually discern an unfamiliar tool's purpose. In a small study (N = 21) we conducted with adults (8 males) between 20 and 68 years (M = 30 years), participants were given a cherry/olive pitter and asked what the device is. A single participant gave the right answer; most answers (incl. the modal response "hot glue gun"), were far off. It thus seems that humans' technical understanding shows clear limits without a meaning-providing cultural context, be it in the form of others' demonstrated use of an object or tool shops with labeled object categories etc.

With these points of critique, we hope to have shown that human technological culture and its propagation cannot occur without epistemic and technical transactions involving other agents who master the "technai" that render cultural products accessible for use and reproduction. Human sociality is irredeemably written into humans' technical capacity.

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