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Chimpanzees socially learn non-instrumental behaviour from conspecifics

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Abstract

Studying animal culture has been insightful for understanding the complexities of knowledge transmission and tracing human culture's evolutionary origins. Most studies in this field have focused on material culture — behaviours that involve the use of tools and objects in ways that provide clear practical benefits to the individuals. We have previously documented a tool-use tradition without discernible function in which chimpanzees replicated the practice of inserting blades of grass in their ears from one persistent inventor. Now, over a decade later, we have observed an unrelated group of chimpanzees at the same African sanctuary, where five out of eight individuals began wearing grass in their ears and six out of eight from their rectums within a short period of time. Neither of these behaviours were observed in any of the seven other sanctuary groups ($N = 136$), except for two males in the original grass-in-ear group. Network-based diffusion analyses revealed a strong signature of social transmission for both variants. We conclude that chimpanzees adopted non-instrumental behaviours from each other and discuss how the study of social traditions without clear adaptive function could advance the field of comparative cultural evolution.

Keywords

Chimfunshi Wildlife Orphanage Trust, chimpanzee, network-based diffusion analysis, non-instrumental behaviour, social learning.

1. Introduction

Animal culture, broadly defined as socially learned behavioural phenotypes leading to between-group variation (Whiten et al., 1999), is a central focus of contemporary research, offering insights into the evolutionary origins of human cultural practices (Allen, 2019; Whitehead et al., 2019; Whiten, 2021). Much of the early work in this field has concentrated on material culture — behaviours that involve the use of tools and objects in ways that provide clear practical benefits to the individuals (Boesch & Boesch, 1990: p. 19; Wrangham et al., 1996; Whiten et al., 1999; Biro et al., 2003; McGrew, 2004; Boesch et al., 2009). A notable example of material culture in non-human animals (henceforth “animals”) is nut-cracking behaviour in chimpanzees (*Pan troglodytes*), where individuals use wood or stones to break open hard-shelled nuts (Boesch et al., 1994; Luncz et al., 2018). Neighbouring chimpanzee groups sharing similar ecological conditions vary not only in their use of nut-cracking (Koops et al., 2022), but also in their strategies, with some being more efficient than others (Luncz et al., 2012, 2018). Another noteworthy example of material culture in animals is tool use by New Caledonian crows (*Corvus moneduloides*), where individuals create and use stick tools to extract insects and larvae from crevices (Hunt, 1996; Hunt & Gray, 2003).

In addition to these material cultures, there has been growing interest in social traditions among animals, which may not serve an obvious instrumental purpose but nonetheless seem conducive to social cohesion. For instance, handclasp grooming in chimpanzees and bonobos (*Pan paniscus*) involves pairs of individuals clasping each other’s hands above their heads while grooming, a behaviour that varies between groups and appears to strengthen social bonds (McGrew et al., 2001; Nakamura, 2002; Fruth et al., 2006; van Leeuwen, 2021). Similarly, capuchin monkeys (*Cebus* spp.) engage in social games that involve complex interactions and play behaviours, fostering social relationships and group cohesion (Perry et al., 2003). Social games in capuchins, such as finger-in-mouth or object-passing, are group-specific, socially learned, and stable over time, suggesting they function as affiliative

traditions that help reinforce social bonds (Perry et al., 2003; Perry, 2011). Furthermore, in species like humpback whales (*Megaptera novaeangliae*), distinct songs are passed down and modified over time within populations, possibly serving as a form of social identity and communication (Fournet et al., 2018; Zandberg et al., 2021). In other cetaceans, non-instrumental behavioural traditions have been reported, like “tail walking” in bottlenose dolphins (Bossley et al., 2018) and, albeit less well-documented, orcas wearing dead salmon on their heads (Pare & LiveScience, 2024). This diversity in social customs highlights the importance of non-instrumental culture in the lives of animals, as these behaviours may facilitate group identity and social integration (Garland & McGregor, 2020; Goldsborough et al., 2021).

Thus, documenting social behaviours that lack a direct physical purpose (hereafter: “non-instrumental”) is essential as they offer parallels to aspects of human culture, where many social customs are arbitrary and serve more to reinforce group identity and cohesion than to impart specific skills (Haun & Over, 2015; Smaldino, 2019; Levinson & Enfield, 2020). Behaviours such as fashion trends, rituals, and social norms in human societies often do not have direct material benefits but may promote social bonding and cultural identity (Rappaport, 1999; Whitehouse & Lanman, 2014; Henrich, 2016). Finding similar socially-learned non-instrumental behaviours in the animal kingdom may thus speak to the evolutionary ancestry of our own socio-cultural behaviour.

In this study, we document two non-instrumental behaviours in chimpanzees, of which one is a newly emerged expression of an earlier documented behaviour. In 2010, in a Zambian sanctuary, a female chimpanzee named Julie was observed to repeatedly insert grass into her ear — an idiosyncratic behaviour with no apparent adaptive function. This unusual act, later adopted by seven other group members including her son, was documented as a striking example of social learning and cultural transmission in non-human primates (van Leeuwen et al., 2014). The grass-in-ear behaviour persisted even after Julie’s death, suggesting it had become a cultural tradition (i.e., besides being socially learned and group-specific, also durable and diffusing to new generations; Perry & Manson, 2003; Perry, 2011). Researchers confirmed its cultural basis by noting that it appeared in only one of four observed groups, despite all sharing similar ecological conditions. Unlike most chimpanzee traditions that involve tool use or foraging (e.g., Whiten et al., 1999; Boesch, 2013), the grass-in-ear behaviour

more closely resembled human fashion trends, where the function may be less tangible than in the instrumental context of foraging. As such, the study, in conjunction with similar examples of non-instrumental traditions in other species, highlight animals' capacity for social learning beyond practical needs, offering valuable insights into the evolutionary roots of the many forms and functions cultural diversity may beget.

2. Methods

2.1. Study site

We systematically observed 147 chimpanzees living across 8 social groups for approximately 12 months between May 2023 and October 2024 at the Chimfunshi Wildlife Orphanage Trust (CWOT) in the Copperbelt Province of Zambia. All chimpanzees at CWOT live in forested enclosures where they forage and sleep overnight and are supported by onsite caregiving and veterinary staff. Most CWOT chimpanzees live in the main project site, which consists of Groups 1–5 ($N = 119$). Three other groups (Groups 6–8) reside at the Orphanage, approximately 10 km from the main project site ($N = 28$).

2.2. Observations

In 2014 we first documented a non-instrumental behaviour we called “grass-in-ear behaviour” (GIEB) in Group 4, seemingly innovated by one individual (Julie), and subsequently adopted by the majority of her group members (van Leeuwen et al., 2014). In the seven other CWOT groups, we did not observe GIEB. A few chimpanzees from other groups are occasionally observed inserting and moving grass in their ears (like Debbie, the one chimpanzee from Group 2 that was conservatively counted in the original study, see van Leeuwen et al., 2014); however, they never pushed it into their ear canal in a way that allowed it to stay without being held or physically supported.

Now, 10 years later (this study), we have observed the independent emergence of another GIEB innovation and diffusion at CWOT, this time at Group 8, comprising a small community of 8 chimpanzees rescued primarily from Sudan. In December 2023, 3 additional rescued chimpanzees (Aimée-Love, Fidelou, and Vicky) were integrated, bringing the total current population of Group 8 to $N = 11$ (Table 1; see Table 2 for a total demographic overview of the CWOT communities).

Table 1.

Demographic breakdown of Group 8 at CWOT as of April 2024, following the integration of Aimée-Love, Fidelou and Vicky.

Name	Est. DOB (Age)	Sex	Year of integration	Rearing history	Rank	GIEB adopted?	GIRB adopted?
Aimée-Love	1 September 2017 (5)	F	2023	Wild-born	9	Yes	No
Aimi	1 January 2011 (12)	F	2018	Wild-born	5	Yes	Yes
Annie	1 June 2014 (9)	F	2018	Wild-born	6	Yes	No
Commando	1 April 2015 (8)	M	2018	Wild-born	3	No	Yes
Congo	1 June 2010 (13)	M	2018	Wild-born	1	No	Yes
Fidelou	1 May 2017 (6)	M	2023	Wild-born	11	No	No
John	1 January 2017 (6)	M	2019	Wild-born	7	Yes	Yes
Juma	1 January 2011 (12)	M	2018	Wild-born	2	Yes	Yes
Miriam	1 June 2010 (13)	F	2019	Wild-born	4	No	No
Vicky	1 May 2013 (10)	F	2023	Wild-born	10	No	No
Victoria	1 June 2016 (7)	F	2019	Wild-born	8	Yes	Yes

DOB estimated by sanctuary staff upon arrival. Age in years, as of August 2023, when the majority of our observations occurred. Rank was calculated via Elo analyses of directional pant-grunt vocalisations (a temporal analysis to assess hierarchical relationships based on observed dyadic win/loss interactions; see Neumann et al., 2011).

First, during behavioural observations at Group 8 in 2023, we noticed chimpanzees started to engage in the grass-in-ear behaviour (GIEB), which we defined *sensu* van Leeuwen and colleagues (van Leeuwen et al., 2014) as

Table 2.

Demographic composition of all social groups housed at CWOT at onset of our observations in August 2023.

	Infants (0–3)		Juveniles (4–11)		Adults (12+)		Group <i>N</i>
	Female	Male	Female	Male	Female	Male	
Group 1	4	0	4	4	11	6	29
Group 2	4	9	7	8	20	9	57
Group 3	1	0	1	1	6	4	13
Group 4	2	0	1	1	5	6	15
Group 5	1	0	0	0	2	2	5
Group 6	0	0	0	1	7	5	13
Group 7	0	0	0	0	0	4	4
Group 8	0	0	2	2	2	2	8

Totals excluding individuals housed in quarantine, including those integrated into Group 8 in December 2023.

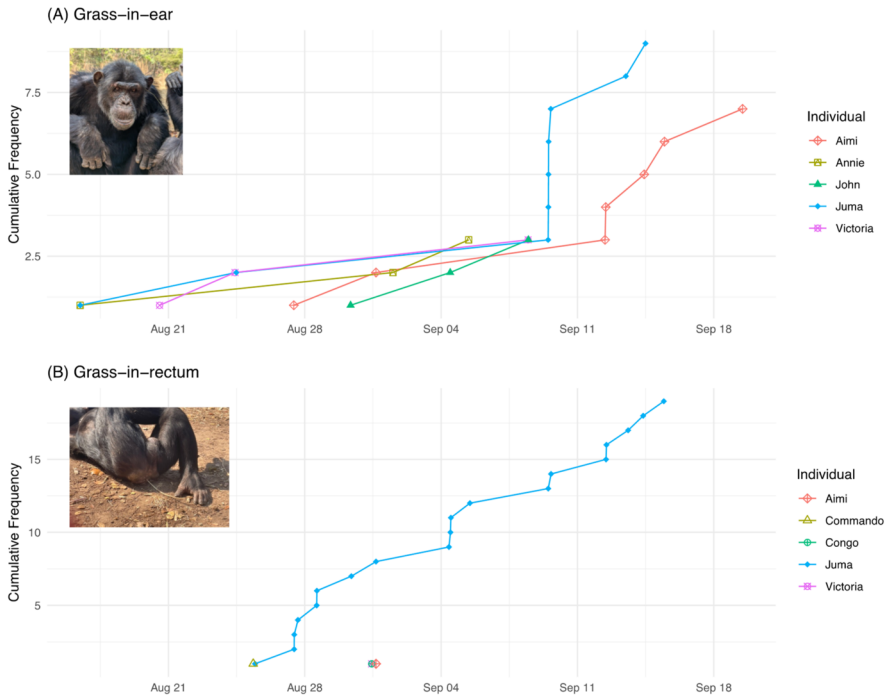


Figure 1. Cumulative frequencies of (a) grass-in-ear adopters and (b) grass-in-rectum adopters in one group of chimpanzees at Chimfunshi in 2023 (first weeks only).

“inserting grass or sticks in one’s ear and leaving it hanging without manual assistance” (Figure 1a). On 16 August 2023 one chimpanzee (Juma) was observed to engage in GIEB, followed by four more individuals within one week (Figure 1a). Upon the integration of three immigrants into this group in December 2023, one (Aimée-Love) adopted GIEB by April 2024 (also see Figures 2 and 3).

Second, on 27 August 2023, Juma engaged in an unprecedented GIEB variation, namely the grass-in-rectum behaviour (GIRB), which we defined as “putting grass or sticks in one’s rectum and leaving it hanging without manual assistance” (Figure 1b). On the same day, we observed Commando engaging in GIRB. Aimi, Congo, and Victoria subsequently engaged in GIRB (all on 31 August 2023; Figure 1b). Later in the season (7 October), John engaged in GIRB as well. As of April 2025, we have also collected additional GIRB observations for Aimi ($N = 1$) and Victoria ($N = 4$). Importantly, in the other seven social groups comprising $N = 136$ chim-

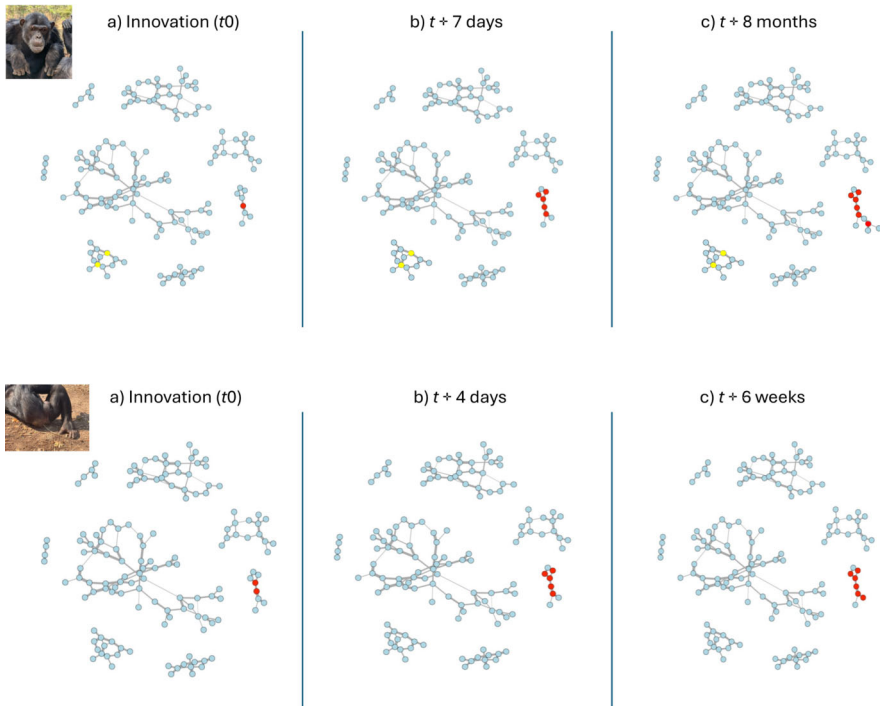


Figure 2. Time steps of the innovation (a) and diffusion (b and c) of the grass-in-ear behaviour (top panel) and the grass-in-rectum behaviour (lower panel) across the Chimfunshi Wildlife Orphanage populations in 2023–2024. The yellow nodes in the top panel represent the two cultural descendants from Julie, the innovator of GIEB in Group 4 in 2014. The red nodes represent the new adopters in Group 8. In the top panel, by time point $t + 8$ months (c), three new immigrants had been introduced to Group 8, of whom one adopted the GIEB.

panzees, during approximately 1100 observation hours between May 2023 and October 2024, we only observed two other chimpanzees engage in GIEB (in Group 4, the original GIEB group, see van Leeuwen et al., 2014)), and none in GIRB. Furthermore, caregivers, visitors, and other researchers did not report any observations of these behaviours beyond Group 8 and the two members of Group 4 (Val and Jewel, the latter being the son of the originator Julie).

2.3. Statistical analysis

We used Network-Based Diffusion Analysis (NBDA) to investigate whether the two behaviours were transmitted via social learning. NBDA is a statisti-

cal method designed to infer social learning by analysing the order in which individuals acquire a behaviour in relation to their social network connections (Hoppitt, 2017). If the transmission of a behaviour follows the network paths, it suggests that social learning is a key mechanism in the spread of that behaviour.

A social network was constructed to represent the potential pathways for social learning. Each node in the network represented an individual chimpanzee, and edges represented potential social connections based on group membership. The network matrix was binary, with a '1' indicating a connection between two chimpanzees (i.e., they were in the same group) and '0' otherwise. We used the Order of Acquisition Diffusion Analysis (OADA) within the NBDA framework to analyse the data (Hoppitt, 2017). Two models were constructed: (1) Social Learning Model and (2) Asocial Learning Model. The Social Learning Model incorporated the social network to test the hypothesis that GIEB and GIRB behaviours were transmitted via social learning. The diffusion rate parameter s was estimated to assess the influence of social connections on the spread of behaviours, where s was computed as the rate of social transmission per unit connection relative to the asocial rate for females. The Asocial Learning Model represents the hypothesis that individuals learned the behaviours independent of social influence. Sex and age were included as individual-level variables (ILVs) that potentially influence the acquisition order. We fitted models incorporating all combinations of ILV effects and employed multi-model inference using Akaike's Information Criterion corrected for sample size (AICc) to assess the support (total Akaike weight) for social transmission through the network and for asocial learning (Hoppitt, 2017).

2.4. *STRANGE* framework

This study adheres to the *STRANGE* framework (Webster & Rutz, 2020) to ensure transparency and mitigate potential biases in animal behaviour research. The chimpanzees included in the study reside at a sanctuary in Zambia. They live in large enclosures of primary miombo forest (Ron & McGrew, 1988) where they can forage and fission-fusion independently. Most chimpanzees spend the majority of their time in their outdoor enclosures, including overnight where they make ground and tree nests. All chimpanzees receive supplemental feedings once or twice a day and receive medical care when needed. Approximately 35% of the individuals were rescued

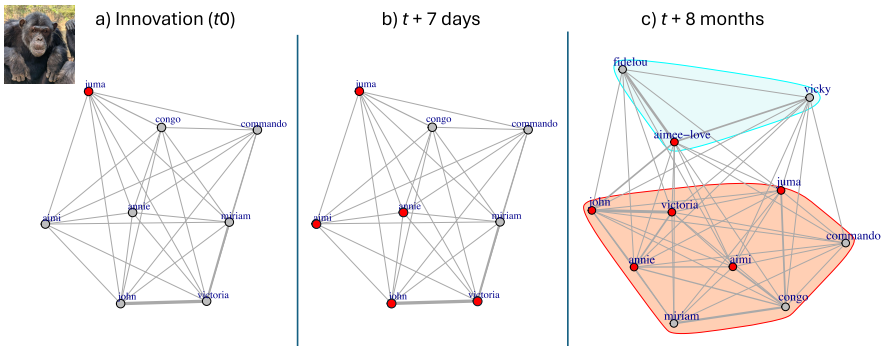


Figure 3. In-depth visualisation of the GIEB diffusion in Group 8 at CWOT. Shown are (a) the time when the GIEB was first observed, being performed by Juma, (b) the diffusion of GIEB one week after the first observation, and (c) 8 months after the first observation, by which time three new chimpanzees had been introduced to the group. Nodes represent the group members of Group 8. Redness in the nodes indicate adoption of the GIEB. The thickness of the edges represent association strength based on close proximity. The networks were created using the R package “igraph” (Csárdi & Nepusz, 2006), with diagrams arranged using the Fruchterman–Reingold weighted algorithm (Fruchterman & Reingold, 1991). This layout enhances edge length uniformity and reduces edge crossings. Communities in panel (c) were identified using the fast-greedy algorithm (Reichardt & Bornholdt, 2006), which identifies optimal community structures by maximising modularity. It begins with each node as its own community and iteratively evaluates the modularity change for all possible community merges. In each step, it merges the pair of communities that results in the greatest modularity improvement, following an agglomerative approach (Vairachilai, 2018). The three immigrants were thus identified as a separate cluster.

from the bushmeat trade or other detrimental circumstances and rehabilitated at the sanctuary, where they have resided for several years. The remaining individuals were born and raised in the sanctuary by their mothers. The study was entirely observational, with no alterations to routine husbandry practices. All observed behaviours emerged spontaneously within the chimpanzee groups. All groups are open to infrequent visits from tourists, and several have engaged in group-based behavioural experiments since 2011. The sanctuary is a member of the Pan African Sanctuary Alliance (PASA) and adheres to strict husbandry guidelines from PASA and the Zambian Wildlife Authority (ZAWA), ensuring high standards of animal welfare.

3. Results

For both the diffusion of GIEB and GIRB, the group network received the most support (both 99%), with asocial models being supported for less than

1% (corrected for the number of models fitted). GIEB yielded an s parameter estimation of s (95% CI) = 0.99–7.00 and GIRB yielded an s parameter estimation of s (95% CI) = 0.99–8.99, corresponding to an estimated 83.6% and 100% of chimpanzees having learned the behaviour via social learning, respectively. Age and sex did not clearly impact the rates of asocial or social learning (all estimates < 12% likely to be in the best model). Our analysis thus favours social over asocial learning as the primary explanation for the diffusion of both GIEB (Figure 2, top panel) and GIRB (Figure 2, lower panel) among the chimpanzees of Group 8 at CWOT. After the introduction of three rescued chimpanzees in Group 8 in December 2023, one of these immigrants (Aimée-Love) adopted the GIEB within 4 months. Aimée-Love was also most connected to the resident group by April 2024 (Figure 3).

4. Discussion

We document an independent wave of a non-instrumental behaviour in chimpanzees which spread within one week to most of the group after the initial observation. Parallel to the grass-in-ear (GIEB) resurgence (see van Leeuwen et al., 2014), we observed the birth of a related variant in which chimpanzees started to wear the grass from their rectums (GIRB), also spreading to most of the group within six weeks. None of the 136 chimpanzees across the other seven groups performed these grass-related behaviours between May 2023 and October 2024, except for two males who reside in the group where the first wave of grass-in-ear behaviour was observed (van Leeuwen et al., 2014). Tailored network-based diffusion analysis provided strong evidence for social over asocial learning, which, in conjunction, shows that chimpanzees can socially learn non-instrumental behaviours from one another, which to date has only scarcely been documented in animals. As an alternative hypothesis, the chimpanzees may use grass instrumentally to alleviate discomfort in their aural and/or anal regions. However, as we nor veterinary staff observed any symptoms that would be expected to accompany the respective grass-in-orifice behaviours under this scenario — like red skin (infections), diarrhoea, or stress-related behaviours like self-scratching or scratching around the respective areas — we deem this function unlikely.

Though we primarily observed GIRB by the same individual (the plausible innovator), the behaviour was adopted by at least five other individuals from the same group, of whom two are still performing it to this day, almost

a year after initial observations. The sustenance of the behaviour within the group long after its initial observation, partially through a persistent key individual (Juma), bears relevance to the discussions on social learning and the emergence of traditions in animals. Traditions have been defined by the behavioural phenotype being socially learned, group-specific and persisting for some time (i.e., durability) (Perry et al., 2003; Perry & Manson, 2003), which we observe to be the case to some extent in the GIEB and GIRB. The first report on GIEB clearly showed durability, and for both the original series of events (van Leeuwen et al., 2014) and the current diffusion of GIEB and GIRB, we provide evidence for social learning and group-specificity. The fact that GIEB outlived its original innovator and main performer in Group 4 (see van Leeuwen et al., 2014) may have to do with long term persistence from that key individual (Julie). By repeatedly engaging in GIEB, Julie may have gradually cemented a tradition in less frequent performers who still regularly perform this behaviour to date. Whether a similar process is currently happening in Group 8 for the two grass-in-orifice behaviours is an empirical question that warrants longitudinal tracking for its potential to shed light on the question how traditions come into existence and may dissipate over time (Morin, 2015).

Due to the spontaneous nature of the emergence of the two behaviours, the precise form of social learning underlying the diffusion of both behaviours is impossible to identify. The “Zone of Latent Solutions” (ZLS) hypothesis is concerned with the difference in social learning capacity between humans and other animals, and interprets the evidence to date to mean that animals – unlike humans – do not copy each other, but instead learn all behaviours, including community-shared ones, individually (Tennie et al., 2020). Entertaining this specific concern, we note that the ZLS model invokes parsimony to argue that if a behaviour can be explained through a combination of “simpler” social learning mechanisms — such as stimulus enhancement or reinforcement — then there is no need to posit the existence of a more cognitively complex process like copying. However, this assumption raises questions about the actual cognitive demands of copying. How do we define and measure the complexity of such a process within the ZLS framework? This is especially true in light of recent studies in great apes (van Leeuwen et al., 2024; Permana et al., 2025) and bumblebees (Bridges et al., 2024) evidencing know-how copying. Thus, perhaps the copying exercise comes more easily than predicated by the ZLS account and may as such be much

more prevalent than the ZLS stance has given credit to. Furthermore, most studies do not empirically demonstrate the involvement of these lower-level mechanisms but rather assume their operation on the grounds of parsimony. This reliance on theoretical simplicity leaves unanswered questions about the hierarchical organisation of complexity within social learning mechanisms (Byrne, 2002). Our point is that quantification of complexity in cognitive functioning is a prerequisite for weighing mechanisms against each other in equations of parsimony. Even so, we note that strictly speaking GIEB and GIRB *could* currently be viewed by ZLS proponents as expressions in which copying might actually happen. The ZLS requires baselines to see if animals would come up with the respective behaviour themselves, without having to see demonstrations by knowledgeable individuals (Bandini et al., 2020; Tennie et al., 2020). Baselines of chimpanzees with grass available are virtually endless, while the Chimfunshi community is the only hitherto documented community in which the behaviours occur. Yet, as per van Leeuwen et al. (2014), we deem it most likely that the chimpanzees were socially facilitated into their grass-in-orifice response (as the series of actions leading to grass-in-orifice is arguably not very complex and constituent of behaviours all chimpanzees are familiar with), although we note that the behavioural phenotypes the chimpanzees acquired were entirely new to them, which would preclude “response facilitation” as the main driver behind the diffusion of the behaviours (Byrne & Russon, 1998).

We view the spontaneous adoption of two relatively odd inventions by means of social learning interesting in its own right, regardless of the exact mechanism facilitating the diffusions. If chimpanzees socially learn non-instrumental behaviours from group members, which apparently they do, then this opens up the possibility that social learning in animals provides a useful (co-opted?) tool for not only acquiring skills to aid in their physical subsistence (e.g., Boesch et al., 2020; Permana et al., 2025), but also for bolstering social identity and social cohesion, which are major forces driving human cultural evolution (Henrich, 2016; Smaldino, 2019). Given the growing social bonds in adolescent male chimpanzees as they begin to develop alliances (de Waal, 1984; Goodall, 1986), this is evident in our particularly immature group and our observation that Commando, an adolescent male ranked below Juma, was the second to perform GIRB. Such a non-mechanistic angle on the matter would highlight adopting group members’ behaviours for purely social reasons. This angle has been taken in human

psychology, aimed at explaining exaggerated forms of social homogeneity, for instance by means of conformity (Asch, 1956; Haun et al., 2013). Such a drive to mimic each other's behavioural phenotypes has been theorised to be linked to increased levels of trust and cooperation, mediated by a sense of familiarity (Latane & Wolf, 1981; Haun & Over, 2015). In these cases, copying may not serve to obtain valuable information about local contingencies yet still be functional in terms of social bonding. While speculative, this could also be happening in the chimpanzees' practice of sharing the grass-in-orifice behaviours, with some recent reports attesting to its possibility (Haun et al., 2012; Watson et al., 2018; Goldsborough et al., 2021). If true, we would expect to find observable differences between adopters and non-adopters, with the former obtaining social benefits in one way or another. For example, a chimpanzee attempting to integrate into a new group might mimic the grooming patterns or submission displays of their fellow group members to gain social approval or avoid aggression (Luncz & Boesch, 2014; Goldsborough et al., 2021). We would postulate that especially in high-stakes situations, such as social integration in chimpanzees, such relationships between social learning and social benefits should become apparent. Future research is warranted to test this possibility systematically.

Another account for the individual variability and contextual influences underlying the emergence and diffusion of GIEB and GIRB could come from drawing on the Zone of Proximal Acquisition (ZPA; Whiten, 2022) and the Zone of Bounded Surprisal (ZBS; Manrique & Walker, 2023). The ZPA encompasses behavioural variants that individuals can acquire through personal exploration and/or social exposure — reflecting learning potentials shaped by developmental readiness and contextual experience. When the context is conducive, for example due to group members frequently engaging in new behaviours (e.g. see Hobaiter et al., 2014; van Leeuwen et al., 2014), focal subjects may learn a new phenotype socially, thereby gradually extending their behavioural repertoire. The ZBS additionally posits that the functional trigger for individuals to start expanding their repertoire is the element of surprise — i.e., novel behaviours are more likely to be socially learned if they are surprising but plausible based on prior experiences. The chimpanzees' abundant experience with grass and sticks in conjunction with the fact that the particular deployment of these objects in body orifices is rather uncommon lends support for this ZBS account. In this light, the GIRB may be especially “surprising”, yet highly conspicuous due to the fact that

chimpanzees frequently inspect each other's rectum (Goodall, 1986; Nishida, 2012) and even recognize each other from this perspective (Kret & Tomonaga, 2016). Surprising behaviours that involve heavily scrutinized body parts such as these may be especially likely to diffuse socially, by virtue of being subject to more (intense) observation.

Finally, the waves of GIEB and GIRB may represent signatures of chimpanzees' general inclination to adopt behaviours from group members, regardless of any function. In essence, chimpanzees can socially learn novel skills and primarily use them in contexts of personal interest, like nut-cracking and termite fishing. Yet, when selection pressures relax (e.g., due to systematic provisioning in captive care), chimpanzees may extend their social learning occasionally to behaviours without direct instrumental utility. It may still be the case that these non-instrumental behaviours bestow social advantages, like increased grooming from group members, but in the absence of finding such a correlation, the very adoption and persistence of behaviours like GIEB and GIRB could well be opportunistic expressions of the animals' latent capacity to copy behaviour.

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