

AGGRESSIVE MIMICRY AS A HUMAN HUNTING STRATEGY

A Thesis

by

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## ABSTRACT

The expansion of human cognition is a major question in the science of human origins. Several hypotheses have been proposed for its evolution, primarily the Foraging Brain and the Social Brain Hypotheses. Thus far, the Social Brain Hypothesis has much support based on its explanation for the evolution of Theory of Mind (ToM) in which social group size led to the development of adept mind-reading and human deception in the human species. Alternatively, the Foraging Brain Hypothesis explains cognition through the lens of environmental pressure. Viewed as emphasizing separate sides of the same problem, I propose a potential pathway for the evolution of human deception independent of sociality that can be explained through ecological drivers: that of deception as a human hunting practice.

Utilizing cross-cultural data gathered from the Human Relations Area File, I identified numerous (n=356) cross-cultural cases of the application of a hunting strategy in non-social hunting contexts across 143 cultures. By comparing similar behaviors in non-human animals which utilize a hunting strategy known as aggressive mimicry, I suggest a potential pathway through which the evolution of deception and mind-reading may have taken place. Namely, whereby shifts in the ancestral environment and a change in the human dietary niche to rely on broad, hard-to-obtain foods led to a reliance on novel ways of capturing prey, including deception. Rather than theory of mind developing from sociality, I suggest social applications of mind-reading in humans could have theoretically followed the development of these applications for foraging contexts. This framework is also discussed in relation to paleoanthropological findings and human language evolution.

## DEDICATION

To my parents.

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The completion of this thesis is the result of a collective effort by many friends, family members, and mentors to keep me sane and allow me to finish my thesis at Texas A&M. I certainly cannot name everyone or their effort, but I hope to highlight at least a few who were critical to my success and decision to finish this thesis.

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## CHAPTER I INTRODUCTION

The brain and the mind it facilitates are among our species' most distinguishing features. In addition to a number of biological and social features, our brains set us apart from most of the biological world; so much so that paleontologist George Gaylord Simpson proposed the notion that humans occupy a completely separate adaptive zone from the rest of the Primate Order, having undertaken a critical step in his new hypothesis of quantum evolution (Simpson 1945). Even more radically, evolutionary biologist Julian Huxley once proposed that humans should be placed into a new kingdom of life on the level of the *Metazoa* known as *Psychozoa* (Huxley 1959). Less controversially, nearly all distinguishing behavioral features of humans follow directly from our brain: deception, creativity, tool-use, cultural evolution, storytelling, and even language all follow from our massive neocortex. It's difficult to imagine how a group of small Pleistocene apes could have come to dominate the planet without it. Yet despite its importance and remarkability, anthropologists have not come to agree upon *why* our brain is the way it is.

Among the explanations for the evolution of our brain lie several hypotheses which are typically taught as being in opposition to one another: the social brain hypothesis, the foraging brain hypothesis, the sexual brain hypothesis, and the cultural brain hypothesis (Barton and Dunbar 1997, Muthukrishna et al. 2018, Kaplan et al. 2000, Geher, Miller, and Murphy 2007, Miller 2011). Each posits an explanation for our cognitive expansion in several different ways, emphasizing certain components over others, and thus far, few syntheses have been reached. But like many processes in nature, it may be possible it was a mixture of several of these processes giving rise to our species.

At the baseline, several things are agreed upon. The first is that the human brain is rather large compared to similar sized taxa, but not necessarily unique aside from its relatively sized up

cerebral cortex (Herculano-Houzel 2012). The second is that humans are prolific copiers and cultural beings (Herrmann et al. 2007, Henrich 2017). Compared to most other organisms, the human ability to copy is so strongly honed that there are abundant examples of this copying being a *detriment* to us on an individual level (Tennie, Call, and Tomasello 2006, Boyd and Richerson 2007). The third, and final agreed upon principle, is that humans have a hyper-awareness of who we are and who others are (Byrne and Whiten 1990). We have the ability to not only know our own intentions (many animals do not know even this), but to also know the intentions of others and how much they know about our own intentions. This is a cognitive feature humans and several other creatures possess known as theory of mind (ToM) (Dennett 1983).

This thesis seeks to help address human cognitive expansions specifically in the framework of humans' "unique" cognitive quirks. Although a number of explanations have been proposed for the evolution of our cognition, each hypothesis has traditionally been held in opposition to one other and synthesis has failed to have been reached. In this thesis, I seek to synthesize several of these by proposing a pathway through which the evolution of human cognition can be explained. Namely: through the employment of deception against our prey in response to a changing climate and dietary demands, humans were able to hone and gain the ability to lie, maintain fictions, and create falsehoods against one another. Using cross-cultural ethnographic data, I identify instances of deception, known in the literature as "aggressive mimicry," whereby humans utilize deception against their prey in the context of lures, calls, and decoys. As a potential route for the evolution of deception, this can be integrated with other hypotheses including the cultural brain, foraging brain, and finally with the social and sexual brain hypotheses. In this light, I propose that rather than humans' unique theory of mind arising

from our Machiavellian motivations, these social applications could have followed the development of cognition and theory of mind in foraging contexts.

## CHAPTER II BACKGROUND

### **Four Theories of Mind**

At the forefront of theoretical explanations for the expansion of human cognition are at least four theories, two of which are primary for explaining why the human mind is so advanced in its multiplicity of mental traits. These primary theories include the efficient foraging brain hypothesis posited by Kaplan et al. (2000) and the social brain/Machiavellian hypothesis posited by Barton and Dunbar (1997). Among the more secondary, but nonetheless discussed hypotheses, are the sexual brain hypothesis advocated for by evolutionary psychologist Miller (2011) and the cultural brain hypothesis advocated for by Herrmann et al. (2007) and more recently by Muthukrishna et al. (2018). The distinction between the designation of any one of these explanations as “primary” or “secondary” is arbitrary except that many aspects of both the sexual brain and the cultural brain hypotheses are partially accounted for in Dunbar’s social brain hypothesis (to be explained below).

### ***The Social Brain Hypothesis***

One of the earliest formalized hypotheses for the evolution of the human brain and cognition is the social brain hypothesis (referred to in this thesis as the SBH) proposed by Barton and Dunbar (1997). Barton & Dunbar’s hypothesis primarily attempts to describe the evolution of human cognition by accounting for our specific cognitive features including human group sizes, group modularity and memory, deception, and hierarchies. As such, the SBH is often well known for explaining the human brain in terms of both its hyper-Machiavellian and super-cooperative features not typically seen together in other primate species (Barton and Dunbar 1997, Dunbar 1998). Per the SBH, group size and the lifestyle large groups impose are the primary drivers of brain evolution. As group sizes in *Homo* increased, novel cognitive faculties

were required by internal selection pressures to expand the relative size of the brain in order to remember other group members, to be able to recall past information, and to navigate much larger social hierarchies. Most important to the argument is the observed relationship between primate neocortex size and primate group size (Figure 1, below) (Dunbar 2009, 1993). In humans, this number averages out to a social group of 150 individuals, which has been recreated in reference to the size of military platoons, average social networks, and number of Christmas cards sent out each year (Dunbar 1993, Dunbar 1996).

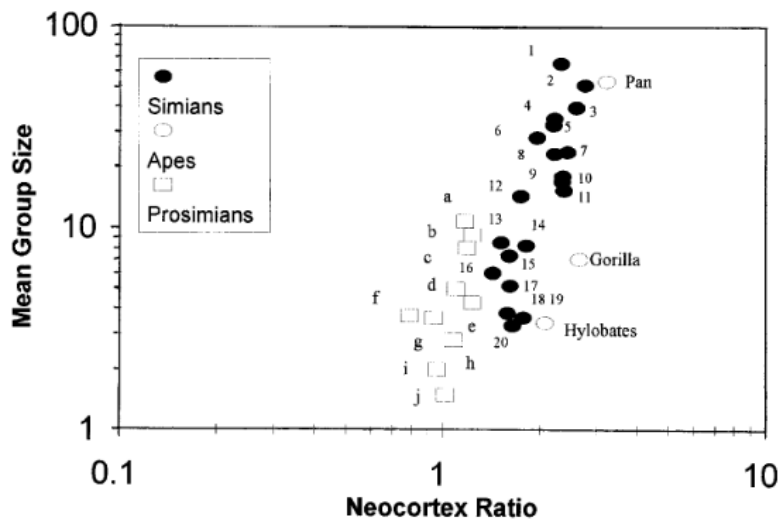


Figure 1. The relationship between mean group size and neocortex ratio. From Dunbar (1998).

Critically with the SBH, we find an account for a number of other broad evolutionary accounts for human cognition including the sexual brain hypothesis (focusing on sexual selection) and the cultural brain hypothesis (focusing on humans' unique capacity for copying and innovation). Broadly, what's allowed by the social brain hypothesis is an account for the

development of an understanding of mental representations shaped by conspecifics, which has been argued by several cognitive scientists to be necessitated, or at least indicated, by the ability to create false beliefs (Van Heusden 2009, Gazzaniga 2004, Byrne and Whiten 1992).

Yet problems exist with the Social Brain Hypothesis in its initial theoretical form, namely in the tautological nature of its explanation for a social brain's origins and a massive lack of comparative data from non-primates to corroborate social selection pressures as shaping the brain. For example, "brain size correlates with group size and sociality in primates, thus sociality is why the brain arose," exhibits circularity on account of the fact that it fails to explain why specific network sizes are adaptive group traits on their own. From an ontological standpoint, the correlation of two separate traits with one another generally does not allow for a causal account of which trait drove the other through natural selection (Gould and Lewontin 1979). In the case of the SBH, this is manifested in this correlation between brain size and social group size. Although brain size and social group size may be related, an alternative account may be that brain size *constrains* social group size rather than being evolved to facilitate them. Per the reasoning of the traditional SBH, the reasons why a group of roughly 150 individuals is adaptive has not been addressed, and it is unlikely that an organ as costly as the human brain arose through neutral evolution.

Furthermore, the *most* social animals tend to not have many of the cognitive features you see in primates and humans. Non-primates including mole rats, ants, social ungulates (including wildebeest and dolphins), and penguins provide stable alternative models for what a brain adapted for sociality looks like, but few include theory of mind like we see in the Machiavellian intelligence proposed by Dunbar, de Waal, Byrne, and Whiten (De Waal 1982, Dunbar and Shultz 2007, Whiten and Byrne 1988). In fact (Dunbar 2009) has recently agreed that the

original model of the SBH does not work outside of mammals, much less primates, stating, “On more careful analysis, it turns out that this quantitative form of the social brain hypothesis is more or less unique to primates.” Even within primates, the SBH is contentious. Taking a phylogenetic approach to the question, DeCasien, Williams, and Higham (2017) quantified a number of facets of primate diet and sociality, finding that the best predictors for primate neocortex size is diet and propose it is the presence of spatial storage and extractive foraging rather than sociality which is responsible for primate intelligence in most species.

Many of these critiques have not gone unnoticed by Dunbar, who has reformulated his hypothesis several times to meet them. The most recent iteration of the hypothesis holds that not only is primate sociality unique, but anthropoid sociality and human sociality are unique, as well. Yet Dunbar still asserts that human group sizes arose in response to increased predation pressures (it is questionable if this is the case given that the relative number of predators probably did not increase in the EEA), that frugivory drove the evolution of sociality in humans (while admitting that frugivorous birds do not behave the same way as frugivorous primates), and arguing that it was early anthropoid monogamy which allowed for the social brain to expand (while ignoring the fact that nearly 90% of birds are monogamous (Lack 1968) and yet the most hyper-social among them do not exhibit “social brains”). See Emery et al. (2007) for a partial defense of Dunbar’s revised SBH focusing on corvids and also note convergence in fission-fusion parrots in Bradbury and Balsby (2016). One should recall that monogamy is quite rare in mammals occurring in almost 30% of primate species (Lukas and Clutton-Brock 2013), but that this form of monogamy is not the *social* monogamy Dunbar refers to that is present with fission-fusion social structures (that said, one should also question at what point a model like the SBH

fails to maintain the status of a predictive model so much as becomes a general description of a species' social system).

Such a paradox forms when we ask about humans' most unique features, such as our ant-like and naked mole rat-like hyper-sociality which extends *far* beyond group sizes of 150. Dunbar (1993) recognized this paradox when he first formulated the SBH, leaving open the question, "How is it that, despite these apparent cognitive constraints on group size, modern human societies are nonetheless able to form super-large groups (e.g., nation states)?" Such questions are currently examined in the comparative literature for what are known as multi-level societies which, unlike those observed in penguins, mole-rats, and ungulates, are characterized by several differently structured units within one overall "society" (Grueter et al. 2017). These societies are found largely in ants (Moffett 2019), primates (Grueter and White 2014), and whales (Cantor et al. 2015); but the neural mechanisms required for maintaining our current "anonymous" societies are poorly understood. Moffett (2013) proposes that the maintenance of group identity is largely semiotic and symbolic, which would support some level of higher-order social tracking on the scale of the SBH as well as cognitive "offloading" counter to the SBH; while others propose the evolution of cultural transmission and cultural group selection as the driving factor (Cantor et al. 2015, Richerson et al. 2016) (also see Lamba & Mace 2011 and Lamba 2014 for objections- see discussion on the cultural brain hypothesis below). Regardless of the case, ultra-sociality does not seem to conform to the standard predictions and parameters of the SBH or the evolution of human brains, but the answers here are yet to be settled upon.

### *The Sexual Brain Hypothesis*

One version of the social brain hypothesis attempts to explain cognitive evolution via the mechanism of sexual selection. For example, James Neel (1980) and Neel and Salzano (1967)



hypothesized that the origins of human intelligence lied in human leadership, whereby sexual selection acted on ancestral human societies to produce intelligent leaders. Linking Machiavellian Intelligence to human sexual selection, Neel's paradigm has been a productive area of research: multiple studies within evolutionary psychology have been attempted to elucidate the link between sexual selection and leadership. For example, Figure 2 shows a graph from a well-cited study by Marlowe (2004) where in Hadza hunter-gatherers, the only trait in a potential spouse that females preferred more than males was intelligence (albeit it was listed behind foraging ability, character, and looks). Currently the reproductive skew of males deemed more intelligent than their peers in groups like the Hadza has not been measured, but results finding even a skew towards more intelligent males may support a weaker version of Neel's hypothesis. One such attempt by Von Rueden and Jaeggi (2016) observed 288 statistical associations between traditional leadership/intelligence traits and human status in both traditional and developed societies. While the authors found a significant effect for these traits in human societies, contrary to the predictions expected by Machiavellian sexual intelligence, found that the effect of these status and intelligence markers on reproductive success in humans was 0.19, far lower than that for nonhuman primates, 0.8. The effect sizes between traditional and modern societies did not significantly differ.

Also commonly examined is the mating intelligence hypothesis proposed by Miller (1997) and later formalized by Geher, Miller, and Murphy (2007), that argues that the evolution of the human brain is best explained by classic Fisherian runaway selection (Miller 2011, Fisher 1930). Understood in this framework, the human brain can be something akin to the ornate and expensive tail of a peacock, whereby preference by females for smart, humorous, and creative males drove the expansion of the human brain through means of sexual selection rather than

natural selection. As it provides a plausible mechanism through which the social brain may have arisen, such hypotheses may be tenable, as well. In the context of sexual selection, evolutionary “red queen” and “chase-away selection” scenarios, whereby organisms are in a constant struggle against one another (in the case of chase-away selection, this involves male signaling against female perception and female perception against male signaling) are not uncommon in nature and have even been suggested in shaping behavioral traits, such as bird song and gift-giving in insects (Van Valen 1973, Holland and Rice 1998, Sakaluk, Avery, and Weddle 2005).

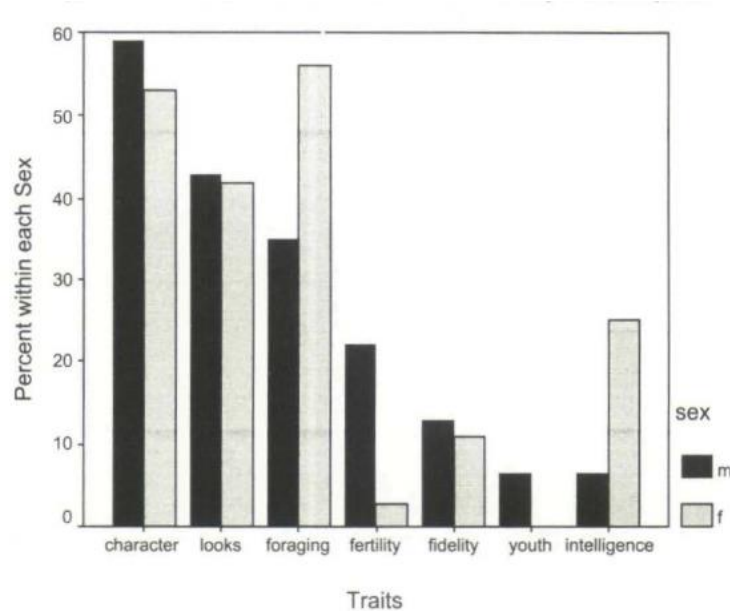


Figure 2. Spouse preferences among Hadza hunter-gatherers. From Marlowe (2004)

A primary example of how sexual selection may drive the evolution of complex behavioral traits and limited creativity is found rudimentarily in some species of songbird and, more elaborately, in bowerbirds (family *Ptilonorhynchidae*). In budgerigars (*Melopsittacus undulatus*), a member of the parrot Order, females are more attracted to males who exhibit complex problem solving abilities over males who do not (Chen et al. 2019). Bowerbirds, which

are endemic to Papua New Guinea and Australia, are characterized by elaborate and creative “home” displays, or bowers, created by males out of flower, pieces of bones, glass, and other objects out of the environment. In these species, more “impressive” displays, measured by number of pieces or the presence/absence of optical illusions, have consistently been found to be correlated with male mating success in several species (Borgia 1995, Kelley and Endler 2012).

In concordance with the mating mind hypothesis, early research indicated that bower complexity correlated with overall cognitive ability in males (Keagy, Savard, and Borgia 2009), but more recent findings refute a correlation between overall cognitive ability and problem solving, finding instead that only ability to copy previous successful bowers is correlated with mating success (Isden et al. 2013, Keagy, Savard, and Borgia 2011). One should also note that the case study in budgerigars, the ability to problem solve is likely driven by environmental ability rather than runaway sexual selection *a priori* (Wyndham 1980) and there is no indication that ability to problem solve is at all correlated with ability to put on a *better sexual display* which might overwrite the emphasis on cognitive ability (a control for which might be interesting as the experiment here pitted two equally attractive males against one another). For bowerbirds, such findings are not dissimilar to models of copy-ability and cultural transmission of birdsong (Freeberg 2004) where song ability has not been found to correlate with cognitive ability, either (Anderson et al. 2017, Payne 1982), indicating that it may not be *creativity* which is selected for, so much as an open/plastic ability to recreate sounds and visual stimuli from the environment to match female demands (Searcy and Nowicki 2005).

Aside from the bowerbird example, there is some evidence in humans supporting the sexual brain hypothesis. For example, among the Agta hunter-gatherers in the Philippines, storytelling is associated with increased reproductive success in males (Smith et al. 2017), while

thoughts of sex elicit creativity in WEIRD male college students (Griskevicius, Cialdini, and Kenrick 2006). In females, Haselton and Miller (2006) measured preference for males in females across the reproductive cycle and found evidence that women during their ovulatory phase of their cycle (when evolutionary psychologists predict females switch to a “good genes” over “good provisioner” strategy) prefer males with high creativity lifestyles over businessmen while also finding evidence that females across the entire cycle have a strong short-term (but not long-term) mating preference for creative males over wealthy ones (see Gangestad et al. (2007); also see Wood and Carden (2014) and Wood et al. (2014) for critical analyses of preference shifts across ovulatory cycles). Indeed, the peak years of many male creative types including painters, poets, and philosophers are often troped as taking place during the early-mid/late 20s, and evidence from Nobel laureates at least partially corroborates these findings (Weinberg and Galenson 2005).

While such findings have been reported as evidence of creativity emphasized in mate selection, it is worth it to note that the study of female preference was limited to a questionnaire of WEIRD college students (n=41) where realistic expectations for mating partner cannot be expected. Likewise, the extent to which the creativity test can be applied to global samples is questionable (study n=35 males), as the effects in Agta gatherers (who, in fact practice arranged marriages) are likely due to increased social support by good storytellers, rather than increased mating success (Headland 1978, Buckner 2019). Finally, the presence of preferences throughout life for art, regardless of reproductive state, were noted by Steven Pinker who argued, “For a lot of art forms, the peaks are in the 30s and 40s rather than in the late teens and 20s...Anything a person can do can be used as a courtship display...But art, music and language and intelligence don’t follow the pattern of sexual selection particularly well. A 70-year-old woman playing

Mozart on the piano for her own pleasure is not of the appropriate age or sex or circumstance for an explanation in terms of sexual selection.” (Pinker 1998)

### *The Cultural Brain Hypothesis*

Another alternative which might be seen as an elaboration of the social brain hypothesis is the Cultural Brain Hypothesis. Under the cultural brain hypothesis, human brains evolved proximately similar for the reason they did in bowerbirds, which is for social and asocial learning and copying. Muthukrishna et al. (2018), in summing up the CBH, corroborate the observation from neurology that neural density is associated with information storage and retrieval and argue that lags in human development are associated with learning and an increase in the ability to adapt to novel situations. The CBH therefore distinguishes itself from both the sexual brain hypothesis and the SBH by focusing emphasis on the *generality* of adaptive knowledge, rather than confining it to specific domains.

The approach of the CBH comes directly from the field of cultural evolution and dual-inheritance theory (Richerson and Boyd 1978) (also known as gene-culture evolution) whereby a feedback system exists between human cultural and biological systems. Proponents of dual-inheritance recognize adaptability in cultural beliefs both in individuals and on a group-selection level: why do some populations and ideological systems outcompete others and what are the forces guiding that? Through this lens cultural systems, while not unique to humans, are arguably seen as our strongest adaptive tool or cognitive technology. The ability of cultural systems to change more rapidly than genetic ones has been noted by a number of authors (Bell, Richerson, and McElreath 2009, Henrich 2004), as has the ability for prosocial and altruistic traits to arise on a population-level in the absence of kin selection when evolutionary processes predict the opposite (Gintis 2003, Fehr and Fischbacher 2003, Boyd and Richerson 1982).

Thus far, the only weakness for the CBH is in the lack of support of its evidence (as it is a new hypothesis) and lack of theoretical grounding from non-human examples supporting the thesis that copying *is* cognition. For example, as discussed with bowerbirds above, the most cultural creatures are not necessarily the smartest. For example, one of the strongest non-primate example of sustained *adaptive* cultural transmission is in European great tits (*Parus major*) who were first noted to culturally transmit milk bottle-opening abilities in the 1940s (Sherry and Galef 1984). More recent work utilizing experimental field setups show that great tits fail to solve abstract problems without solutions first being culturally transmitted (Aplin et al. 2015) and that different ways of solving the same problem are transmitted along geographic lines (Somveille et al. 2018).

Other examples of cultural transmission have been noted in primatology, first among different foraging traditions in populations of Japanese macaque in the 1940s (Kawamura 1959) and later with direct observations of cultural transmission of sweet potato washing (SWP) behaviors in a now-famous troop at Koshima Islet in Southern Japan in the 1950s (Kawai 1965). Later observations in chimpanzees corroborated cultural transmission in our closest relatives in both adaptive contexts such as tool use (Whiten, Horner, and De Waal 2005) and neutral/social contexts such as rain dancing, hand clasping, and stone throwing (Whiten et al. 1999, Kuhl et al. 2016).

The cultural brain hypothesis has its strengths over others in explaining the origin of culture, which is hallmark to humans, as well as rudimentarily explaining theory of mind in terms of copying. In terms of theory of mind, certain lines of research support the notion that copying both involves imitation of “mentors” and conspecifics, but also that it involves some level of understanding mental states. Unlike songbirds and bowerbirds, copying visual-specific

behaviors of other individuals (rather than songs or bowers) rather than imitating them (whereby imitation involves the action of mirror neurons rather than strict representation) may involve some form of representation. Yet it also cannot be argued that copying of *bowers* in bowerbirds is not representation, as fundamentally many important aspects of cultural evolution setting humans apart from other animals hinge on the ability to copy *instructions* rather than copying specific behaviors (this is at least the viewpoint of memeticists such as Blackmore (2010) and Aunger (2001); see Wimsatt (2009) for a critical opinion). Representing a bower in ones' head and recreating involves some slight level of abstraction *and* representation, however myopic.

### ***The Foraging Brain Hypothesis***

Often taught in opposition to the social brain hypothesis is the foraging brain hypothesis proposed by Kaplan et al. (2000). Kaplan et al.'s hypothesis posits that the human brain arose as a result of large-scale climatic shifts during the Pleistocene which led to a critical change in the human dietary niche. Similar thoughts were previously alluded to, although not expanded upon in accounting for energetics, in the now-famous 1968 Man the Hunter Symposium and later in early sociobiology (Edward 1975, Washburn et al. 1968). Theoretically, Potts (1998) variability selection hypothesis lays a partial framework for the hypothesis arguing that constant changes in the Pleistocene landscape required hominins to focus on the exploitation of high-quality, not easily obtained foods not typically exploited by other animals in the landscape. In return, the brains of early *Homo* became larger and more expensive in order to take advantage of these resources. In essence, early humans shifted from a relatively easy foraging woodland-chimpanzee like niche to a more cognitively demanding one, putting massive selective pressures on human brains and minds to exploit them (see Figure 3, below) (Kaplan et al. 2000).

Unlike other explanations for the evolution of the human brain, the foraging brain hypothesis is unique for taking an energetics approach to understanding our intelligence. While our brain is indeed large, there are other outstanding features of our species which cannot be ignored pertaining to life history including: relatively long lifespans, our extended period of altriciality compared to other primates, our support of older individuals (as in the case of menopause for female humans), and male provisioning of mates and offspring. Unifying these four features, Kaplan et al. have argued that such traits did not arise independently but are instead fundamentally tied to our large brain and its unique cognitive capacities. In such a way the expense of the brain early in life is seen as an *investment*, covered by provisioning by grandparents and males in the early years and later repaid. Such accounts of life history both match productivity rates of human males compared to chimpanzees, as well as the cost of the brain in early life (Gurven, Kaplan, and Gutierrez 2006, Kaplan and Robson 2002).

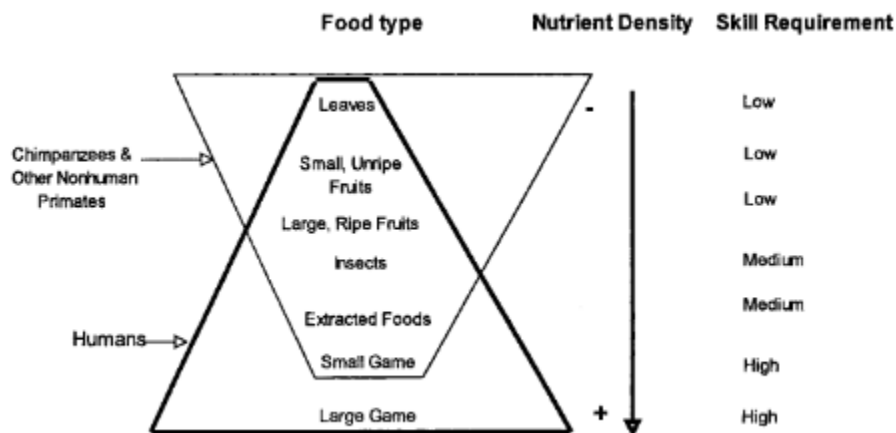


Figure 3. From Kaplan et al (2000). Note the antithetical relationship between nutrient dense foods and the skill requirement to obtain them



The evolutionary explanation posited by the FBH is not novel in biology and has a comparative basis. In the field of primatology (which is albeit arguably more anthropological in theory than biological), primate species which use more creative forms of exploitation for their nutritional demands are commonly referred to as “extractive foragers” (King 1986) and recognized as among the most intelligent of primate species: capuchin monkeys (genus *Cebus*), aye-ayes (*Daubentonia madagascariensis*) (Rilling 2006), orangutans (genus *Pongo*), and baboons (to an extent; genus *Papio*) are recognized as extractive foragers (Melin et al. 2014). In some accounts of life-history theory the tradeoff between r-selected (more offspring, shorter lifespan) and k-selected (fewer offspring, longer lifespan) has been explained *vis-à-vis* a tradeoff between an emphasis on canalized and innate behavioral patterns and an opposing emphasis on behavioral plasticity (Woodley 2011).

In this scenario, the expansion of the human brain is seen as the result of ecological, rather than endogenous factors such as intraspecific competition or runaway sexual selection. In many evolutionary explanations for the brain, this method is preferred for its parsimony and invocation of an *external* selection pressure for human cognition. Despite this, it has its weaknesses compared to other models. For example, while a more expensive and larger brain seems to certainly correlate with better hunting techniques, it does not correlate with the specific cognitive adaptations that set humans apart from the rest of the primates. Why is it that quirks like theory of mind, the creation of false beliefs, and fictioneering arose with a large brain? Thus far, the FBH makes a prediction: that it will more than likely be due to ecological factors, but posits no definitive answers.

## *Synthesis*

Sociality might explain encephalization to a limited extent in primates, but complex behaviors need not arise from encephalization. For example, much of the debate on the perception of pain in fish has been under gridlock due to the fact that while fish exhibit all the behavioral responses to pain as their “higher-order” counterparts, they do not exhibit the neural architectures (Key 2015, Sneddon 2012). Likewise, ants exhibit highly differential, yet nonetheless “complex” collective behaviors despite having small brains, so while the social brain hypothesis might fit explanations for encephalization (and only in primates), social and cognitive examples outside of primates and humans fail to account for Dunbar et al.’s overall package. It’s more than possible that Dunbar’s hypothesis accounts for *some*, but not all of the features that its original form employs. For example, it might follow that a larger brain indeed results in better memory and social tracking required for maintaining such groups (Chittka and Niven 2009), but it may not be the case that a larger brain results in the deceptive and copying behaviors that Dunbar’s theory purports to explain.

Evidence for this arises across the animal Kingdom, small-brained and large. For example, cetaceans, which exhibit complex group dynamics and social structures rarely seen outside the primates, do not seem to have granted us any examples of deceptive behaviors or the ability to possess false beliefs (Hill et al. 2018) despite both passing mirror tests and showing us some indication that they possess Theory of Mind (Reiss and Marino 2001). Conversely, *Portia* jumping spiders, which are composed of a relatively solitary genus of jumping spider, exhibit cognitive adaptations for deception at length (Jackson and Wilcox 1993), but have a brain roughly the size of the head of a pin (Prete 2004). Such examples also highlight a critical problem for some aspects of the foraging brain hypothesis: while the expansion of the brain

allows for the accession of *more* information, it necessarily does not follow that one can use this information in the correct ways.

Within the cognitive sciences, this problem expands to the problem of what, exactly, cognition and intelligence *are*. Cognition itself has a plurality of definitions. The problem manifests as follows: cognition and intelligence follow from the overall number of cortical neurons in the brain, which in turn allow for some increasing level of information-processing capacity (Roth and Dicke 2005). How is it, though that information processing capacity equates to intelligence or cognition? Kyllonen and Christal (1990) propose, at least in human contexts, that the number and density of neurons is quite literally an upgrade to overall processing speed, and, more radically, that reasoning ability is really a measure of overall working memory. Viewed in this lens, intelligence and cognition are simple corollaries of the brain's capacity to store and retrieve information. Such insight finds support in correlates between working memory and intelligence (Colom et al. 2004), but recent experiments in the comparative psychology of chimpanzees (Volter et al. 2019) indicate a similar visual working memory capacity to humans. Additional studies in both monkeys and humans show that while humans possess a higher working memory load than monkeys, overall processing actually declines with a larger working memory load in both groups (Elmore and Wright 2015). Despite this, the methodological limitations of these discussed studies should be noted, as tasks for visual memory might be *constrained* by similar brain localization and circuitry in chimpanzees and humans (Haier 2016) and that other types of working memory tests such as task switching, might be more appropriate for comparative approaches (Oberauer et al. 2008). In any regard, such a perspective stands in stark contrast to separate approaches which propose that cognition is a higher-order emergent property of separate mental processes.

An alternative approach is exemplified through the concept of cognitive modularity. First proposed by Fodor (1983), the modularity of mind hypothesis proposes that separate cognitive traits could have been canalized in separate ways. That is to say, different biophysical and neuronal circuitry will give rise to separate lower-order and higher-order behaviors rather than separate types of behavior emerging from more general processes. Within evolutionary psychology this approach developed into the *massive* modularity hypothesis where *most* behaviors and cognitive schema were the result of natural selection (Sperber 1994). Although more extreme forms of the modularity hypothesis run rampant, there is at least some support for modularity of mind, particularly as exemplified by recent findings in connectomics (Taylor, Wang, and Kaiser 2017) and neural network models (Clune, Mouret, and Lipson 2013) which indicate domain-specific processing in our neural architecture.

Surveying 11 cognitive scientists, Bayne et al. (2019) found several features important: representation, sensory-input independent processing, processing complexity, learning processes independent of *associative learning*, and the ability to utilize models. For nearly all of these, some form of semiotic cognition (Jorna and van Heusden 1998) is necessitated under the guise of *representation*. In fact, for measuring cognition, Roitblat (1982) and Gallistel (1989) propose that representation is a good measure of a species' cognitive complexity. As a broad concept, representation can carry several meanings, but generally refers to an imagined object or entity created as a mental stand-in for a *real* object or entity. Representation can follow through on several levels: representation of objects, representation of numbers, representation of the future, and in the case of Theory of Mind, representation of others' thoughts. It seems from comparative examples that the inclusion of one type of representation in an animal's cognitive repertoire does not necessarily imply the presence of other forms of representation, which may be mediated by

differential cognitive circuitry. For example, the supposedly “convergent” cognitive systems of octopuses (Mather and Dickel 2017), primates (Bloch and Boyer 2002), and jumping spiders (Jackson and Cross 2013) alike have been assumed to be the result of an interplay between visual and tactile systems.

### ***What is Required for a Hypothesis for Human Cognitive Expansion?***

Given these caveats, a potential mark of extreme cognition may be found in deception (although we should not limit our description only to this single benchmark). Through lying, we receive plasticity, mind-reading, active problem solving, and, more limitedly, intent. What is necessitated in an account of human lying is a cognitive adaptation which accounts for (i) plasticity, (ii) orders of intentionality, (iii) the creation of clear falsehoods, and (iv) unifies these adaptations under some larger environmental pressure.

It is certainly true that humans lie and deceive each other in their social systems on a level not matched in the animal kingdom, but it’s not necessarily true that lying, deception, and fictioneering arose in the human species to accommodate these things. Such fallibilistic reasoning is endemic to some schools of evolutionary psychology whereby the presence of a trait in its modern adaptive context is held to be evidence of its evolutionary origins. Early critics of evolutionary psychology debated the pitfalls of such thinking at length, arguing for the role of co-option and spandrels in evolutionary dynamics (Pinker 1997, Gould 1997). With such thinking, it’s possible that theory of mind and lying arose to solve a separate adaptive problem and was only co-opted for our species’ social purposes.

In the case of deception such a framework may be employed as follows: with the shifting environment per Potts’ hypothesis, humans were pushed not only to a generalist niche (as already seen in baboons and chimpanzees), but to a *high-resource* generalist niche. Following

this, behavioral plasticity, creativity, and learning were emphasized in our species leading to the evolution of an expensive brain. Both the expensive brain and behavioral plasticity necessitated several of the following: larger social group sizes, longer (k-selected) life history strategies along with k-selected (more plastic) brains, altruism to accommodate variance in returns of high-resource foods, the ability to copy, and the ability to actively hold and utilize falsehoods in the mind.

## CHAPTER III LYING IN NON-HUMANS

*“If something cannot be used to tell a lie, conversely it cannot be used to tell the truth: it cannot in fact be used ‘to tell’ at all.”* – Eco (1976)

One of the most difficult problems in evolutionary biology is how it is that communication between conspecifics would have evolved to begin with. Central to this problem is how honest signals between conspecifics are maintained as an evolutionarily stable strategy when the opportunity for a free rider to employ a signal outside its original context grants an individual limitless power over his or her group members. Take for example the function of an alarm call. Signaling the presence of a dangerous predator to one’s conspecifics incurs a cost to a signaler when the predator becomes aware of the individual who draws attention to themselves by vocalizing. These costs are only partially offset by mechanisms of kin selection (assuming a non-trivial number of individuals an organism is signaling to are related to the individual), reciprocal altruism (the assumption that others will faithfully signal to *you* when they spot a predator), and the option of coalitionary defenses such as having more eyes on the predator and, less commonly, mobbing. Given that the cost of initial signaling in potential death is so high, it follows that there would be strong selection pressure for signaling to occur only if it is sufficiently beneficial to the signaler. Likewise, with inconsistent levels of reliable signaling or with high enough levels of unreliable signaling, recipients will stop being manipulated by a signaler’s intentions. Therefore, when overall communication is mutually beneficial to sender and receiver, but where defection is still advantageous to the signaler (as in the case for deception), receivers should evolve mechanisms that maintain signal reliability between individuals.

To this extent, in the theoretical field of animal communication, it's not necessarily honest communication that is difficult for biologists to explain, it's the maintenance of dishonest signaling. The basis for the exploration of the evolution of deception lies in a foundational paper by Dawkins and Krebs (1978) titled "Animal Signals: Information or manipulation?" Arguing that the basis of communication is in a context where communication itself by individuals signal largely to manipulate, rather than helpfully inform, conspecifics, Dawkins and Krebs revolutionized the study of animal communication. Through their lens, it is difficult to see how it is that communication is maintained at all: as a receiver, if most signals are emitted to manipulate you, why respond at all? As a corollary, why *signal* at all? From these basic premises, several principles follow: first, that communication is costly in most contexts; second, that mutual *honest* communication will be preferred in non-antagonistic between conspecifics; third, that for each evolutionary strategy such as those in antagonistic contexts between conspecifics employing deception as a means for fitness gains, there are almost absolutely equal selection pressures on receivers to detect deception.

Aside from the theoretical question of deception is one which continues to puzzle biological anthropologists and evolutionary psychologists alike: given the probable paucity of deception in our primate past, why is it that humans do it so well? In exploring how often humans lie, social psychologists have generally concluded that honest communication is the norm for most people (with most telling *only* one or two lies per day), but that prolific liars exist amongst us, with 5% of people telling 50% of lies (Serota and Levine 2015). Despite this, human beings live in a world of falsehoods. We consume fiction daily for entertainment, live in hypothetical nation-states, enforce and justify moral means through unprovable stories, and spend up to a full twelfth of our lives in a literal dream world during normal sleep. While not



full-blown lies, the ability of humans to create and maintain fictions is a distinguishing hallmark feature of our species (Gottschall 2012). Such were the words of Russian novelist and entomologist Vladimir Nabokov when he said, “Literature was not born the day when a boy crying ‘wolf, wolf’ came running out of the Neanderthal valley with a big gray wolf at his heels; literature was born on the day when a boy came crying ‘wolf, wolf’ and there was no wolf behind him.” How is it that such cognitive features evolved in an otherwise unremarkable primate species and what were its adaptive origins?

To begin, where else does the creation of false beliefs (or lying) occur in the animal kingdom? There are many cases of “tactical deception,” or deceiving for selfish purposes, in primates, as well as a few accounts in birds, but theorists have been careful to note that there is a difference between true tactical deception (falsified by *intention*) and effective signal evolution which does not necessarily imply lying (Whiten and Byrne 1988, Bugnyar and Kotrschal 2002). For example, in the foundational study of tactical deception, Whiten and Byrne (1988) systematically dismiss accounts of deception where animals use alarm calls which are typically reserved for predators to distract conspecifics. Their reasoning is that although we know that a signal is typically reserved for predators and that an aggressor will cease his attack when the predator call is emitted, we do not know that the predator call is *only* a predator call or that the individual who emitted the call was aware that he was lying: it may plausibly be the case that the individual being chased only knows that emitting the signal makes his pursuer go away (Cheney and Seyfarth 2008).

Although situations such as these unfortunately make up the great majority of examples, Byrne and Whiten (1992) documented several accounts of deception coupled with potential mind-reading in the great apes and baboons, with the greatest plurality of accounts (12 out of 26)

taking place in chimpanzees. It has also been found that each of the great apes, aside from gorillas, possess a rudimentary theory of mind (the ability to perceive others' thoughts), but how is it that human lying differs from that of great apes (Swartz and Evans 1994, Krupenye et al. 2016, Posada and Colell 2007)? The first respect is in how many levels of intentionality, or the ability to ascribe beliefs to *multiple* individuals (Dennett 1983). Separate from the rest of the primates, humans can perceive, track, and lie on at least five levels of intentionality. For example: "Peter believes (1) that Jane thinks (2) that Sally wants (3) Peter to suppose (4) that Jane intends (5) Sally to believe (6) that her ball is under the cushion;" is something many humans are hypothetically able to follow, but chimpanzees, on the other hand, can only operate until the second level (Dunbar 2011, Hostetter, Cantero, and Hopkins 2001). The second respect is in the ability of primates to predict that others will respond to their lies. This second aspect is a very active research area for primatologists studying theory-of-mind, as a recent study Krupenye et al. (2016) involving gaze-tracking measurements in great apes suggested that these primates can track lies by other individuals, as well as the responses of others to their lies. Despite these promising findings and building knowledge that at least great apes do lie, the failure of gaze-tracking experiments to replicate in humans (Burnside et al. 2018) and new perspectives on what the experiment is measuring has left us without consensus on whether great apes can predict *responses* to lies (Andrews 2018).

Outside of primates, the best trademark examples of tactical deception are found in corvids but it has also limitedly been observed in cuttlefish and squirrels. In the case of squirrels, tactical deception takes place in the context of deceptive caching, whereby individual eastern grey squirrels (*Sciurus carolinensis*) in the presence of conspecifics will create false caches containing no food to prevent detection of real caches (Steele et al. 2008). This is not dissimilar

to evidence from chimpanzees showing that individuals will hide food from dominant conspecifics and can discriminate whether other chimpanzees have or have not seen their own caches (Hare et al. 2000, Hare, Call, and Tomasello 2001).

Aside from tactical deception, another comparative framework is in recent explorations of the concept of aggressive mimicry: deceiving other animals for the purposes of hunting (Wickler 1965). In aggressive mimicry, an animal purposefully takes advantage of the signals of prey in order to deceive them for their own purposes. Examples include the anglers of angler fish, the deceptive bioluminescence of predatory fireflies (Lloyd 1965, Lloyd and Wing 1983), and the luring of small mammals by snakes using vibrations in their tails (Heatwole and Davison 1976). In addition to these types of aggressive mimicry, it can also take a more cognitive form. Several studies and meta-analyses have been conducted on this unique hunting strategy, but thus far the most convincing evidence is in multiple species of heron (family *Ardeidae*) (Walsh, Grunewald, and Grunewald 1985, Réglade, Dilawar, and Anand 2015, Hunter, Calhoun, and Wilcove 2004, Gavin and Solomon 2009), *Laniid* birds (shrikes) (Atkinson 1997), and *Portia* jumping spiders (Jackson and Cross 2013); of which shrikes and *Portia* jumping spiders are both considered among the “great apes” of their respective families in reference to their intelligence, relative brain sizes, and behavioral plasticity compared to their closest relatives (Barrett 2016).

In the case of *Portia* spiders, aggressive mimicry often takes place through deception of much larger, more venomous prey, especially wolf spiders (Jackson and Blest 1982). Deception in these instances often takes the form of faking vibrational signals which are used by wolf spiders to communicate the presence of prey, potential mates, and rival conspecifics. Figuring out which type of signal to appropriate often takes the place in the form of experimental trial-and-error (Jackson and Wilcox 1993, Jackson and Nelson 2011) and mental-planning by

adjusting their starting methods for specific types of prey (Harland and Jackson 2006). Taken together, this evidence supports the notion that aggressive mimicry and deception in this genus is not only innate, but plastic and dynamic, indicating both learning and adaptability when it comes to deceptive signals.

In birds, recent evidence for aggressive mimicry comes from observations of multiple species of heron as well as little egrets (*Egretta garzetta*) (Post, Post, and Walsh 2009) which actively employ a form of bait-fishing learned via trial-and-error rather than through cultural transmission (Higuchi 1988). In these cases, birds will use some sort of bait ranging from bread, feathers, plastic foam, or insects to lure more desirable food like fish to the edge of the water where the heron will then consume it. Outside of herons, members of the Family *Corvidae* (the crows, jays, and nutcrackers) are often highlighted as analogous examples to humans for the evolution of their large brains and deception (Emery and Clayton 2004). Species of this family characteristically exhibit extreme intelligence including (and not limited to) theory of mind, deception, tool use, and long-term, dynamic memory of food caches (De Kort and Clayton 2005). For example, tool use and causal learning has been documented in the Eurasian jay (*Garrulus glandarius*) (Cheke, Bird, and Clayton 2011), fish crows (*Corvus ossifragus*) and common ravens (*C. corax*) (Montevecchi 1978), and most extensively in New Caledonian (*C. moneduloides*) who create and manipulate hooked extraction tools out of sticks not too dissimilar to those observed in chimpanzees (Hunt 1996). Similarly, multiple instances of deception have been documented for corvids such as hiding food behind barriers in large-bodied ravens (with indications of Theory of Mind) (Bugnyar and Heinrich 2005) and small-bodied scrub jays (without indications of Theory of Mind) (Dally, Emery, and Clayton 2004) and even in solitary nutcrackers (*Nucifraga columbiana*) (Clary and Kelly 2011).

Corvids have often been used to justify the social brain hypothesis as they share similar characteristics in mind and sociality to humans. But this thinking is fallacious. Viewed from a phylogenetic perspective, corvids are not unique as they share a common ancestor with the relatively asocial shrikes (family *Laniidae*) (see Figure 4) who are *also* excellent tool users and liars (Jønsson et al. 2016). Shrikes are well-known by ornithologists and bird watchers alike for their characteristic impaling method of dispatching prey on thorns and other sharp objects, such as barbed wire (Yosef and Pinshow 2005). While such behaviors are partially innate, this behavior is honed and learned throughout life, indicated by effectiveness and kill capture rates throughout life (Busbee 1976). Additionally, usage patterns of impaled prey in red-backed shrikes (*Lanius collurio*) over time indicate a working memory of caches similar to those found in corvids (Morelli et al. 2015); also note the observation that incidentally, caching behavior is also found in tits and chickadees (Family *Paridae*) where it is associated with increased hippocampus size, rather than neocortical development (Sherry and Duff 1996). Finally, behavioral research on the response to songbirds to the winter songs of northern shrikes (*Lanius excubitor*) indicates that northern shrikes utilize aggressive mimicry to imitate the alarm calls of small passerine birds in winter to lure them to hidden perches (Atkinson 1997). As referenced in *The Book of Saint Albans* in 1486, “She will stand at perch upon some tree or poste, and there make an exceedingly lamentable crye and exclamation...all to make other fowles to thinke that she is very much distressed and stands in need of ayde; whereupon the credulous sellie birds do flocke together at her call. If any happen to approach neare her, she...ceazeth on them, and devoureth them (ungrateful subtill fowle) in requital for their simplicity...”

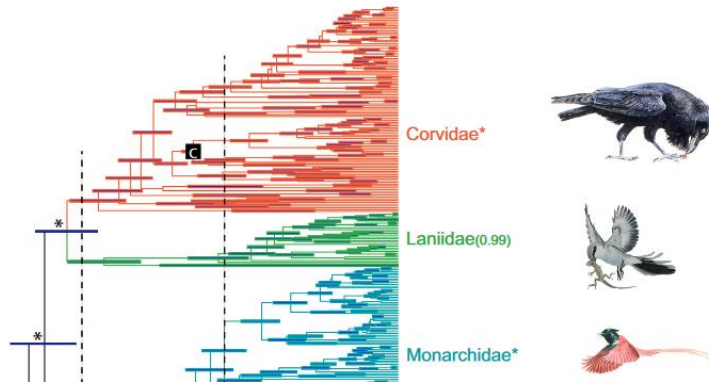


Figure 4. Molecular phylogeny of the Superfamily *Corvoidea*. Note the sister-taxon relationship of *Laniidae* to *Corvidae*. From Jönsson et al. (2016)

Although further research needs to be carried out to assess the cognitive abilities of shrikes, it can be assumed from the limited evidence available that their behavior, too, is exceptional in the animal kingdom. Parsimoniously, it is likely that the common ancestor of corvids and laniids shared the adept cognitive abilities that its modern descendants possess. It follows that explanations for the intelligence of these sister taxa must take into account their radically different social systems. The use of avian luring by northern shrikes is relevant for any hypothesis regarding aggressive mimicry as a driver of lying in animal species. Indeed, corvids evidently utilize theory of mind for their foraging strategies, as is the case for crows which use tools to displace gulls.

As rare as aggressive mimicry is in the animal kingdom, anecdotally it appears to be relatively common in humans. Hunters in the Southeastern United States regularly utilized “hawk whistles” while hunting rabbits and squirrels as follows (Angier and Young 2016): hunters who startled (and startle, as the strategy is still in use) their prey could momentarily halt the prey’s fleeing behavior by releasing a high-pitched whistle thought to mimic the sound of the hawk. Preliminary data from my own experiments in Eastern Texas (n=9) at least partially

indicate that such perceptual hacking through mimicry is not an anomaly, either, as responses in squirrels to human whistles (mean=73 seconds) were closer to actual hawk screeches (mean=84 seconds) than to dog barks (mean=11 seconds) and very much match typical behavioral freezing responses to aerial and terrestrial predators in European rabbits (Pongracz and Altbacker 2000). Additionally, archaeological evidence of the use of decoys in hunting contexts dates back in the Western Hemisphere at least 2,000 archaeological years (Hitchcock et al. 2019), while the explicit copying of avian vocalizations by human hunters and speakers already possesses its own term: warblish (Sarvasy 2016), defined as: “The phenomenon of vocal imitation of avian vocalizations by humans, using existing non-onomatopoeic word(s), as with English *who cooks for you?* (for the Barred owl call) and *Chicago!* (for the California quail call); or a particular vocal imitation using existing word(s).”

These anecdotal examples of deception towards prey in human contexts and highlight the application of traditional ecological knowledge (TEK) for understanding questions about human evolved psychology (Huntington 2000). Like any other technology, aggressive mimicry may be a rare and under-utilized method for hunting by humans. Whether culturally learned or not, the implications of aggressive mimicry for human hunting strategies gives us a direct line for several components essential to understanding our unique psychology by wrapping it in ecological and dietary contexts including: 1) active use of deception, 2) multi-leveled theory of mind, 3) interspecific mind-reading, 4) copying behaviors, and 5) vocal plasticity.

Two questions arise from this behavior: first, is it universal; second, is it effective? This thesis seeks to partially address the first question and the implications of the universality of human deception towards prey species. Theoretically, I hope this thesis provides at least one potential way through which separate hypotheses for the evolution of the human brain and

cognition arose. Proponents of the social brain hypothesis have compellingly illustrated ways in which our brains are used in social and political contexts, but this is not an account of our social brain's origins. Likewise, the foraging brain hypothesis provides a compelling origins account for our brain size and plasticity in different environments but does not account for theory of mind and the traits addressed by the social brain hypothesis. Solutions to similar problems have been addressed by cognitive theorists by identifying possible routes for exaptations to bridge what appears to be a discordancy between two valid hypotheses (Van Heusden 2009). This thesis will question if the evolution of lying could theoretically be accounted for with the foraging brain hypothesis as an ecological driver of human sociality and see if any of the previous hypotheses have merit.



## CHAPTER IV METHODS

Given the nature of the data required to test such an explanation for the origins of a human behavioral universal, this thesis is limited by its inability to apply a hypothetic-deductive model to the question. Instead, here an abductive approach will be applied to question whether cognitive aggressive mimicry is a plausible hypothesis for linking the theoretical frameworks discussed above. This thesis will identify if and where aggressive mimicry occurs in human hunting and assess its contexts.

To accomplish this, I utilized the Human Relations Area Files Standard Cross-Cultural Sample database to compare occurrences of aggressive mimicry across human societies with differing locations and subsistence strategies. The eHRAF sample itself is composed of ethnographic texts from 326 societies on every human-populated continent on the planet, with the addition of Oceania as a geographic region. Societies are split both by regions within these continents and subsistence type (eg hunter-gatherer, pastoralist, industrial diaspora). As a large database composed of thousands of ethnographic texts, the Human Relations Area Files' online component (eHRAF) lends itself to text-scraping methods: simply query terms which are pertinent to your search and extract the pertinent information surrounding them.

Utilizing the Human Relations Area Files, I identified the use of aggressive mimicry with the following terms: deceive, deception, decoy, imitate, lure and luring, and mimic. eHRAF additionally allows you to limit search terms by subject, and the subjects I limited this search to were: Agriculture, Animal Husbandry, Food Consumption, Food Quests, and Ideas about nature and people. I additionally collected data on types of prey captured/killed: fishing, large mammal (and type of mammal), small mammal, carnivore (and type of carnivore), birds, and primates. The social context of the lure was also be ascertained based on the surrounding text: individual,

group, or unknown. In addition to these, the sensory system which was exploited by humans in each context included: acoustic lures, baiting, fire, olfactory, visual, a mix of any types, and ambiguous. Finally, the directedness of the lure, defined as luring the animal directly using a signal from the body, were also ascertained as: direct (using the body), indirect (using something else), or ambiguous. A general outline of parameters measured for this study can be found in Table 1.

<b>Parameter</b>	<b>Description</b>	<b>Values</b>
Exploitation Mode	Which sensory system is being exploited by hunters	Acoustic, Baiting, Fire Fishing, Fishing, Olfactory, Visual, Mixed, Ambiguous
Type of Lure	If the hunter is using mimicry to draw attention to himself rather than to an indirect object	Direct, Indirect, Fishing, Mixed, Ambiguous
Lure Context	If hunters are performing this strategy alone or with a group	Individual, Group, Ambiguous

Finally, for exploratory purposes, I have applied limited descriptive statistics to the data utilizing R statistical software (Team 2013) to systematically measure the context of these findings. These include the frequency of lure types, exploitation type, lure context, lure context in relation to lure type, lure type in relation to subsistence type, and the types of meat exploited.

## CHAPTER V RESULTS

The results of the eHRAF term search can be found in the Appendix and are summarized here. The six terms Deceive\*, Deception, Decoy\*, Imitat\*, Lure\*/Luring, and Mimic\* yielded 324, 111, 327, 1365, 603, and 131 paragraphs, respectively. Of these Deceive\* yielded 18 results of aggressive mimicry, Deception yielded 5, Decoy\* yielded 109, Imitat\* yielded 80, Lure\*/Luring yielded 147, and Mimic\* yielded 8 for a total of 366 examples pulled from eHRAF. Of these, nine examples were pulled not because they contained aggressive mimicry, but were specific references to cultural practices surrounding it – of these, three (Andaman Islanders, Plains Omaha, and Amazonian Tukanos) had references to the practice without referencing employing it or were ambiguous about its use. From the total 357 ethnographic examples, 143 cultures from 34 regions in all 7 continent groups had some form of aggressive mimicry. This represents roughly 45% of eHRAF’s cultural dataset.

The median number of forms of aggressive mimicry practiced by groups was two, with a range between one (n=59, 40% of the sample) and ten (n=1, Subarctic Ojibwa). That said, many texts contained references to the use of aggressive mimicry tactics employed against *multiple animals* but were only recorded once. For example, for the Yanomama of the Amazon and Orinoco Basin, the excerpt (Becher 1966) reads as follows, “They discover every trial [sic] of a wild animal, no matter how faint, sniff it, and announce the time when it was at this place. Often they then follow it for hours through the almost impenetrable forest; sometimes they are gone for several days. Moreover, they know how to attract the animals by imitative sounds.” As the ethnographer only reported this tactic as being employed against “animals,” only one instance could be recorded.

Because these data are mostly intended to demarcate presence/absence and very few (n=2) mention an *absence* of the pattern, it is likely that the data here are an undersampling of the use of aggressive mimicry in traditional societies. For one example (Jackson and Blest 1982), the Amazonian Tukanos, the use of *mimicry* is noted, but the ambiguousness of the excerpt did not allow me to record this group as using the mimicry for luring, “there they patiently stay in ambush without making any noise, or imitating the chirping of the birds that they want to kill....When they hunt with a companion, imitations of bird calls are used for communication.” The ethnographer may have intended to say that the hunters sit in silence *or* that while waiting for birds, they imitate bird calls, but the ambiguity of the sentence and lack of context clues did not allow me to determine whether a call was being used, either.

Of these, as a total 37.25% of all mimicry was acoustic, 32.21% was visual, 12.61% was baiting, 5.88% was fishing (whereby the sensory mode being exploited was ambiguous but directed towards fish), 5.88% was mixed (largely a mixture of visual/acoustic or visual/olfactory), 2.52% was fire fishing (employing fire to lure fish to the surface of the water), 1.96% was olfactory, 0.84% were ambiguous, and 0.84% involved ground vibrations (Figure 5).

## Mimicry Across All Cultures

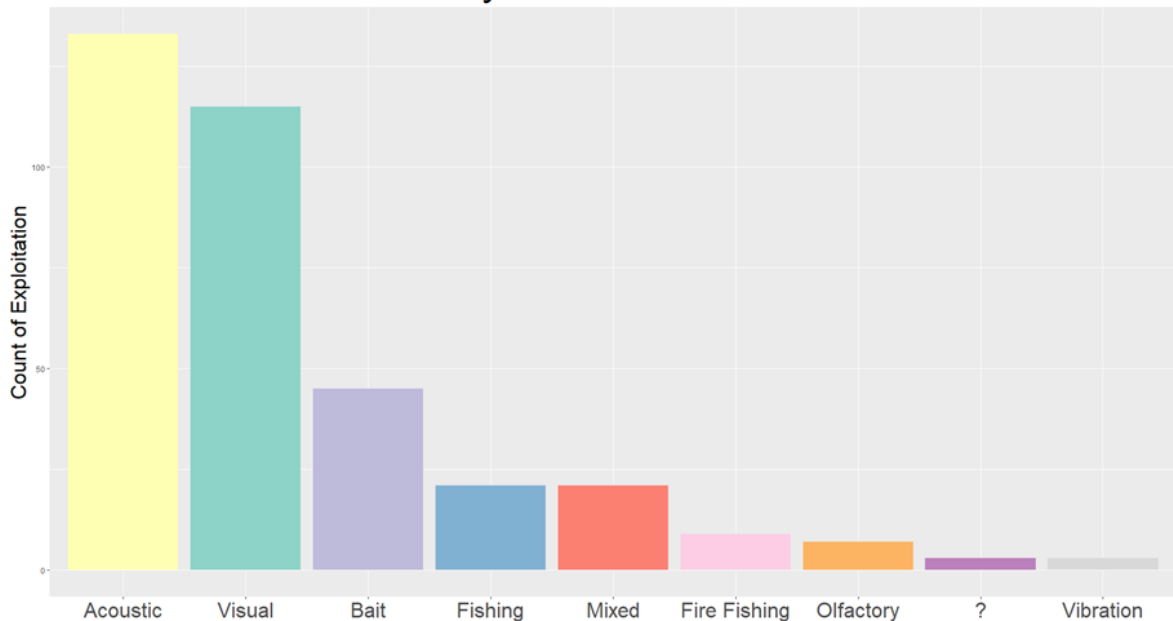


Figure 5. Breakdown for Sensory Exploitations Across All Cultures ( $n=357$ )

As many (but not all) forms of fishing involve the same type of general baiting method, these percentages reported with fishing removed from a modified sample ( $n=283$  out of 357) are as follows: 43.82% was acoustic, 30.74% was visual, 14.13% was baiting, 7.07% was mixed, 2.47% was olfactory, 1.06% was vibrational, and 0.71% was ambiguous. A *further* modified sample with baiting removed (as baiting/trapping combinations are passive forms of exploitation) yields a total of 243 examples as follows: 51.03% acoustic, 35.80% visual, 8.23% mixed, 2.88% olfactory, 1.23% vibrational, and 0.82% as ambiguous.

It is worth noting that while *all* fishing examples have been removed from the subsample described above, not all or even a grand majority of forms of fish exploitation involved direct line baiting. Compelling examples include the use of shark rattles among the Melanesian Trobrianders and Santa Cruz Islanders, as well as Polynesian Samoans; the construction of rat

dummies amongst Samoans the Polynesian Tongans; the luring of fish through the trapping of conspecifics by Tongans, Samoans, and North American Northern Paiutes; and the use of other acoustic signals by East African Nuer, Micronesian Woleains, Polynesian Samoans and Lau Fijians, and Amazonian Ticuna. Figure 6 shows a breakdown of different strategies used for exploiting fish aside from the traditional hook-and-bait method (designated as ‘Fishing’ in this set). Of these exploitation forms toward fish, 38.67% was visual, 28% was fishing, 12% was fire fishing, 12% was acoustic, 6.67% was baiting, 1.33% was ambiguous, 1.33% was mixed (n=75). “Baiting” refers to the use of a fish’s conspecifics and “Fire Fishing” refers to the use of torches for luring fish towards the top of water at night.

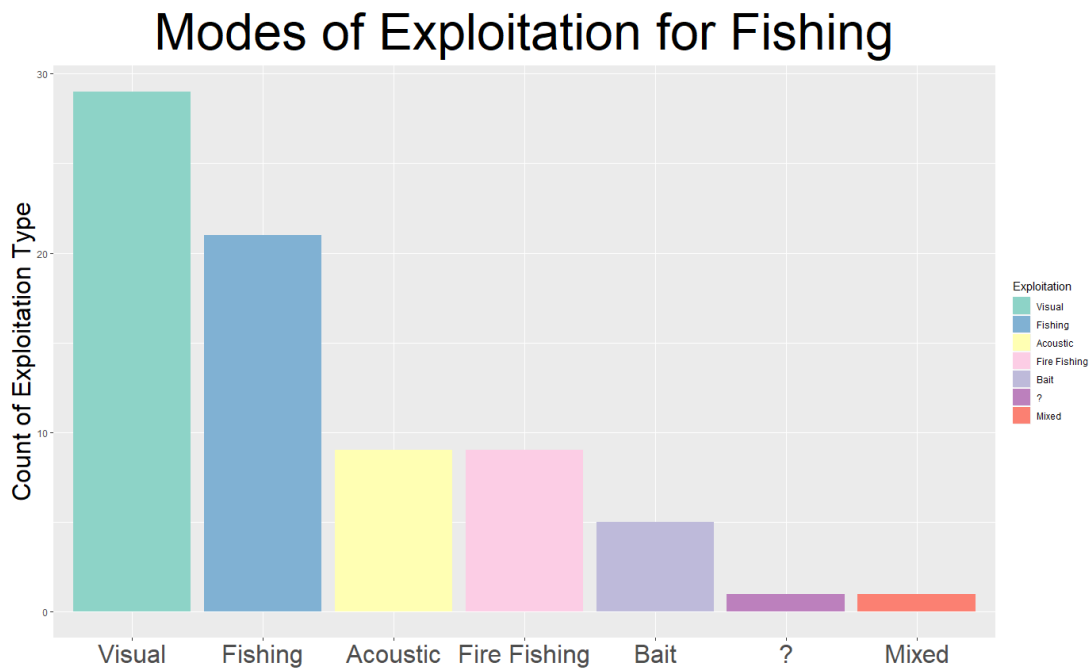


Figure 6. Different Modes of Sensory Exploitation for Catching Fish (n=75)

Besides geographic continent and region, the eHRAF database breaks down each culture by its subsistence type. In this search, eight subsistence types were identified: Agro-Pastoralists (n=11), Commercial Economy (n=1), Horticulturalists (n=61), Hunter-Gatherers (n=155), Intensive Agriculturalists (n=26), Other Subsistence Combinations (n=57), Pastoralists (n=17), and Primarily Hunter-Gatherers (n=28). For the purpose of simplifying analysis, I have broken the categories down into three groups loosely based on the sociopolitical typology of complexity described by Service (1963) growing from foraging societies to horticultural societies to pastoral societies (chiefdoms) to agriculture. As the foraging systems of pastoralists and agriculturalists are not too dissimilar, I have collapsed his last two categories into one, yielding the following three groups: hunter-gatherers (51%), horticulturalists (17%), and other subsistence types (n=31%).

The breakdown for hunter-gatherer sensory exploitations (Figure 7) are as follows: 37.16% visual, 33.52% acoustic, 13.11% bait, 5.46% mixed, 3.83% fishing, 2.73% olfactory, 1.09% fire fishing, and 1.09% ambiguous. For horticulturalists (Figure 8): 57.38% acoustic, 16.39% visual, 8.2% bait, 8.20% mixed, 6.56% fishing, and 3.28% vibration. For all other types (Figure 9): 32.74% visual, 29.2% acoustic, 14.16% bait, 8.85% fishing, 6.19% fire fishing, 5.31% mixed, 1.77% olfactory, 0.88% vibration, and 0.88% ambiguous.

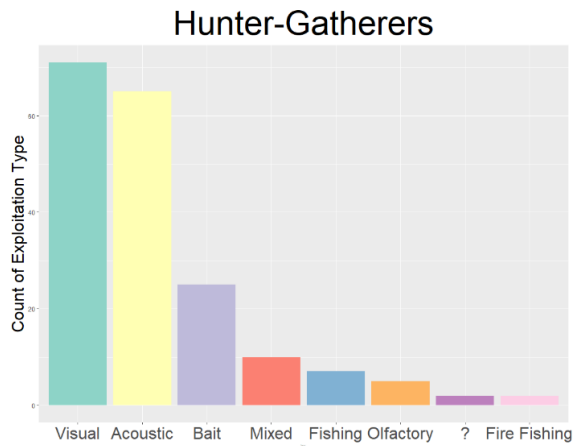


Figure 7. Sensory Exploitations for Hunter-Gatherers ( $n=183$ )

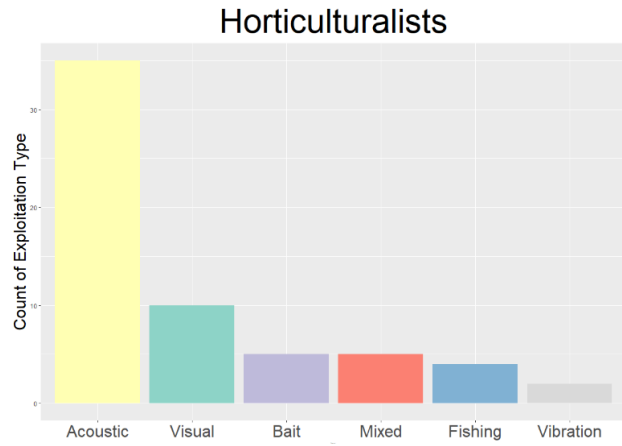


Figure 8. Sensory Exploitations for Horticulturalists ( $n=61$ )

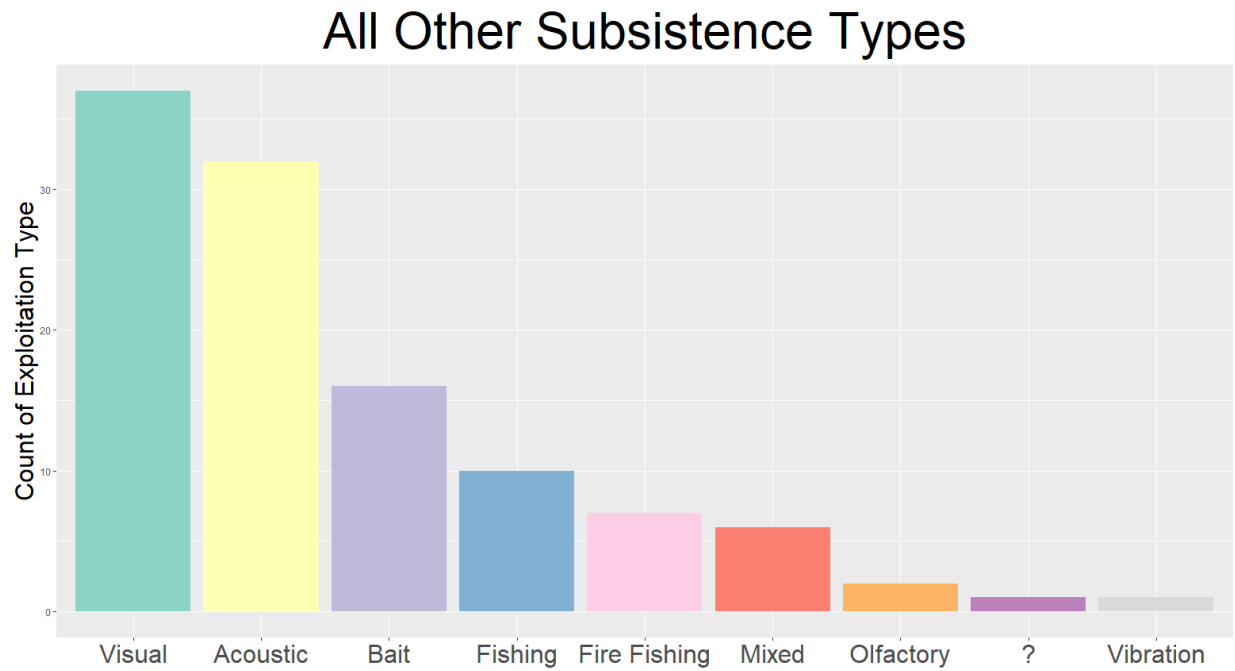


Figure 9. Sensory Exploitations for All Other Subsistence Types ( $n=113$ )



In addition to varying across subsistence type, the directionality of each incident of aggressive mimicry varied by continent, largely between the three largest forms of exploitation: visual, acoustic, and baiting. The distribution of these figures are shown by continent for Africa, Middle America and the Caribbean, South America, Europe, Asia, and North America in Figure 10. Note that a single example came from Bedouin pastoralists from the Middle East, who were categorized as a part of the Asia sample for this analysis. For Oceania, over half (66.12%) of the sample came from fish exploitation. To compensate, Figure 11 shows the sensory exploitation breakdown for Oceania with fish included and removed.

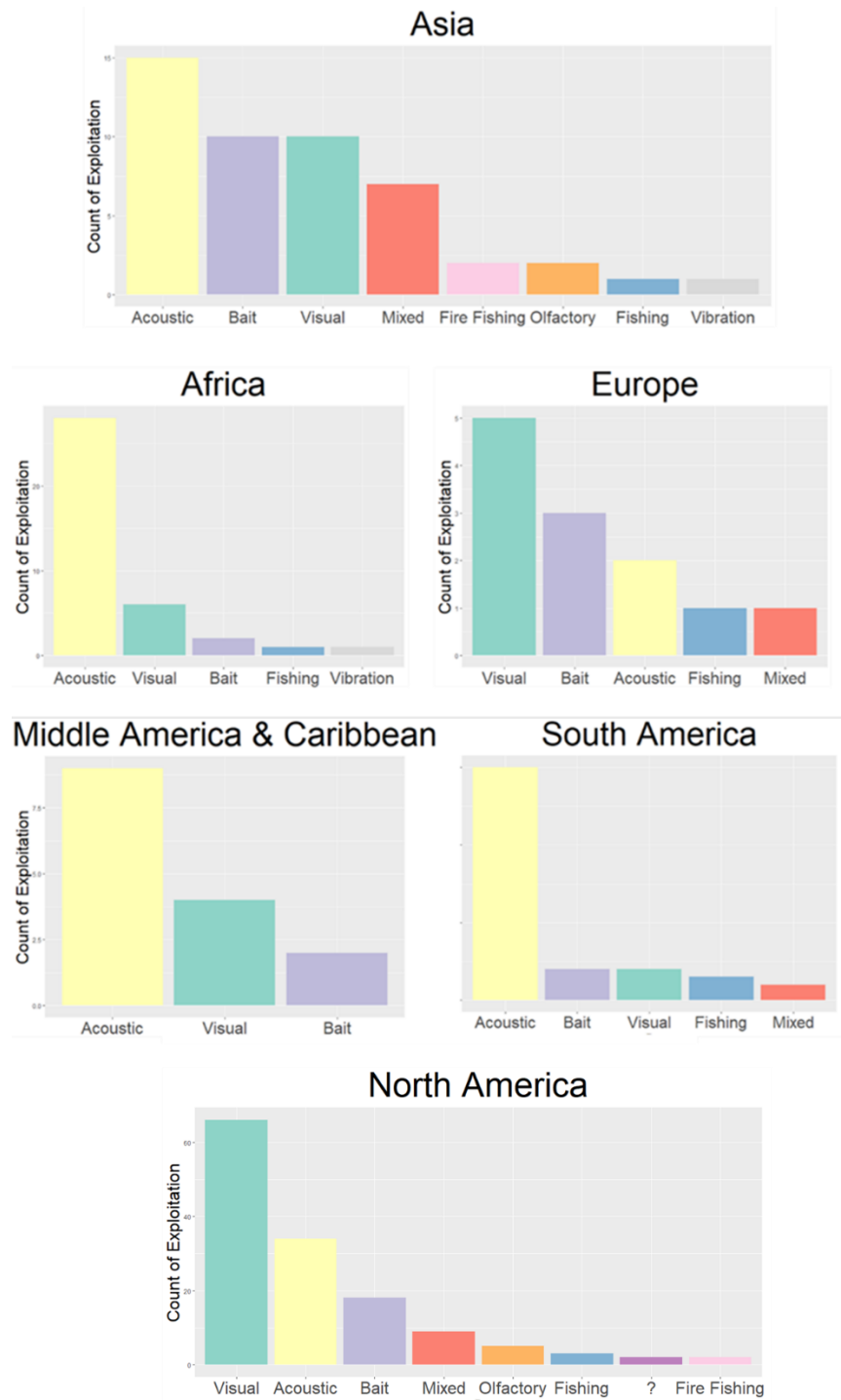


Figure 10. Sensory Exploitation by Continent, Not Including Oceania. Asia ( $n=48$ ), Africa ( $n=38$ ), Europe ( $n=12$ ), Middle America ( $n=15$ ), South America ( $n=43$ ), North America ( $n=139$ )

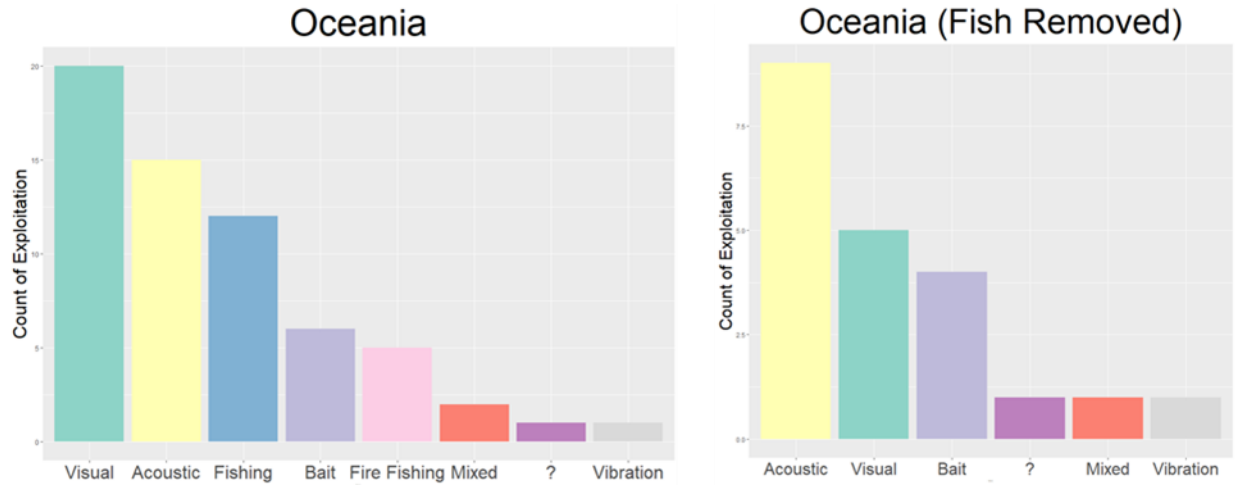


Figure 11. Sensory Exploitation for Oceania, With ( $n=62$ ) and Without Fish Exploitation ( $n=21$ ).

Finally, the directionality of each incident of aggressive mimicry was recorded for this study, yielding the following values: direct, indirect, fishing, and ambiguous. Direct refers to a hunter luring an animal directly to his/her self, rather than towards an external object, scent, sound, or decoy (denoted as indirect). The overall results are as follows (Figure 12): 53.65% direct, 42.7% indirect, 2.53% fishing, and 1.12% ambiguous.

## Mimicry Direction Across All Cultures

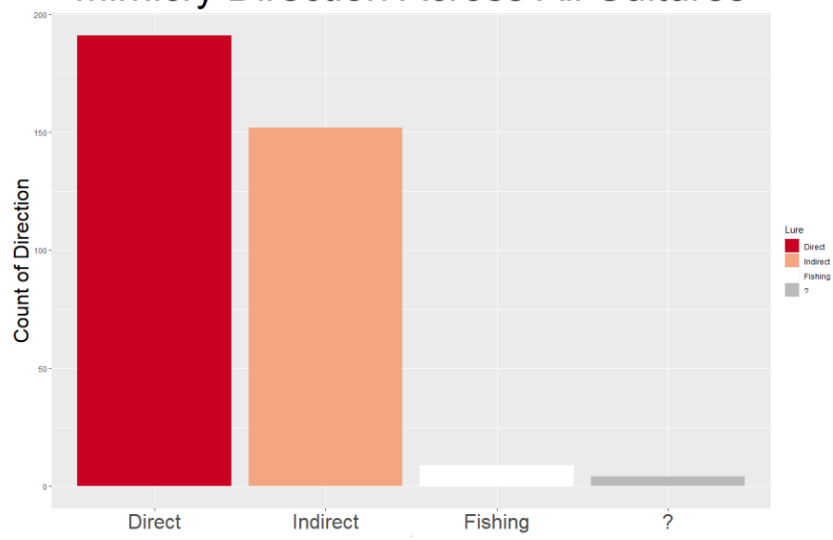


Figure 12. Mimicry Direction Across All Cultures ( $n=356$ )

## CHAPTER VI DISCUSSION

Results from an eHRAF search of only six terms yields a plethora of ethnographic examples of behaviors similar to aggressive mimicry, as observed in *Portia* spiders and northern shrikes. The paucity of such behaviors outside of humans and a limited number of other taxa contrasted with the near-universal presence of such strategies in an ecological food-finding context in humans must be noted. If such a strategy is rare in nature, why is it so common in humans, even across subsistence types?

### **Paleoanthropological Implications**

From duck calls and wooden decoys at Lovelock Cave in Nevada at 2,200 years ago (Tuohy and Napton 1986) to more recent evidence that our earliest ancestors at early hominin ambush kill sites were ambush predators (Bunn and Gurtov 2014), the use of aggressive mimicry in modern humans has several implications for patterns observed both in the archaeological and fossil record.

Assessing modern patterns of aggressive mimicry in ecological equivalents to early hominin sites may yield predictive value. Is it possible that the patterns of employment of aggressive mimicry against modern prey follow the same prey mortality profiles that we see in the hominin record? Could the use of ephemeral vocal or baiting behaviors in modern humans critical for the hunting success of contemporary peoples be assumed for our ancestors? Such questions can only be tentatively be approached using a comparative middle-range theoretical outlook involving modern peoples, modern archaeology, and ancient sites (Binford 1967, Binford 1977).

One prospective research program would involve finding two similar traditional cultures using cross-cultural data, as several were identified in this study such as the differences between the Upper and Lower Kutenai (discussed in the section below), who hunt similar or same species of animal using ambush hunting: one which uses some form of vocal lure and another which does not. One hypothetically could, through field observations ascertain the extent to which the use of lures contributes to a hunter's success (Jerozolimski and Peres 2003). Likewise, experimentally one could pay hunters to not use lures and measure returns within the same populations this way. Such rough extrapolations could serve as a proxy for determining what a hominid site might look like (Bunn and Gurtov 2014, Steele 2003), with obvious limitations.

Archaeologically, the cross-comparative approach here could be extended to anomalous findings in the literature, such as wooden decoys at Lovelock Cave in Nevada (Tuohy and Napton 1986), and the distribution of kill sites around buttresses and natural landscape features. Marean (1997) takes an adjacent approach in examining sites across Africa to examine if early humans practiced an ethnographically recorded coordinated hunting method known as specialized tactical hunting. This method, described by Wissler (1920) involves groups of hunters taking advantage of natural landscape sites with which to ambush prey. Looking at sites specific to the Athi-Kapiti plains in Kenya, Marean compared the prey-mortality profiles of different sites with predictions of the type of mortality profiles one would see by generating behavioral predictions for human ancestors based on extant populations (extrapolated from the mortality profiles of prey hunted by current peoples). Applying a similar approach for aggressive mimicry could apply, so long as seasonal site patterns and ecological variables are taken into account.

## Modeling Language

Although difficult, building a tentative paleoanthropological timeline for the emergence of these behaviors is not novel, as the employment of plastic behaviors in vocal contexts has deep implications for the evolution. One of the few aspects that separate human language ability from primate vocal abilities is precisely in its flexibility and plasticity. As noted by Cheney and Seyfarth (2005), primate brains are almost *primed* for language perception. That is, limited numbers of signals can be perceived and employed in an almost limitless number of contexts. This is not unique to primates, either, as noted by Cheney and Seyfarth, who state, “while the number of distinct calls that animals produce is highly constrained, the number of signs that a parrot, dolphin, sea lion, or chimpanzee can learn to associate with a given stimulus or outcome is, if not limitless, certainly in the tens to hundreds.” As shown in the ape language experiments, the issue with human language is not at all in its perception, but in its production (Cheney and Seyfarth 1998, Fitch 2011).

While important for the human version of language, these issues have little to do with the shape of the vocal tract, as well. To this point, Fitch et al. (2016) showed that the vocal tract of monkeys, in this case a rhesus macaque (*Macaca mulatta*), are already primed for language, as well. That is, contrary to Lieberman (1968), primates can and do produce quantal vowel systems. Quantal vowels, which are the most commonly produced vowels in human language (Stevens 1968), as well as the furthest apart from one another in acoustic space (see Figure 13, below) (Lindblom 1986), are said to be essential for speech production as they allow for the maximal amount of perceptual space when breaking language down into syllabic frameworks (MacNeilage 1998). Indeed, several studies have shown that despite plasticity in number and

types of vowels in different language systems, it is rare for the presence and place of quantal vowels to change (Livijn 2000, Lee 2012).

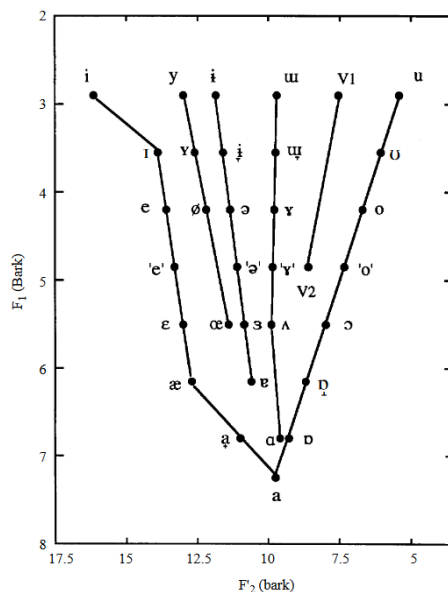


Figure 13. The acoustic-phonetic space of vowels in English. Note the distance between the quantal vowels /i/, /a/, and /u/ from Schwartz et al. (1997)

If it is not articulation that is the issue in producing language for primates, then clearly the issues are with the primate neural substrate (Fitch 2018). For comparative biology, this is the central question as noted by Seyfarth and Cheney (2010) who ask, “Why should an individual who can deduce an almost limitless number of meanings from the calls of others be able to produce only a limited number of calls of his or her own?” Their answer comes as the extension of the SBH, which is that Theory of Mind came first, and plasticity came later. Yet such an answer does not give any indication as to what the proto-steps towards plasticity may have looked like or *why* sociality and Theory of Mind would be so important. Instead, they argue that



nonhumans primates can think in simple sentences but are simply not motivated to because they cannot place themselves in their conspecifics' minds.

Perhaps this is true and it is the case that primates *would* start talking if they felt they should. It may also be the case that primates *do* possess theory of mind but that natural selection has not provided the proper substrate for turning it into language. If we are to fully accept the original argument, vocal production should indeed be limited, but not nearly as limited as their present vocal repertoires consisting of seven or eight calls. If vocal plasticity were even an option, one would expect to see individual *non-social* calls employed in individual non-social contexts (selection against signal ambiguity being the primary driver). Limitations on primate lexicons would stop only when it came to providing social information, but instead we see only a few calls employed in a number of non-social contexts. The fact is that natural selection deemed these calls as good enough- there was never a substrate for which natural selection to build vocal plasticity upon because primates never needed it.

In humans, the use of vocal aggressive mimicry is one such potential substrate. For all regions save for Europe and North America, acoustic exploitations took the primary form of aggressive mimicry, and among acoustic mimicry, 85.6% of it was as a direct (self-emitted) imitation of prey or predators of prey. Not only does aggressive mimicry provide a causal ecological driver for the evolution of vocal plasticity, it also at least partially gives a causal driver for theory of mind. Such an idea was first elaborated by the Epicurean philosopher Lucretius in his sole surviving work, *De rerum natura*, written in the middle of the 1st century, BC, "Men learnt to mimic with their mouths the trilling notes of birds long before they were able to enchant the ear by joining together in tuneful song." Such a hypothesis finds support in recent developments in phonetic theory. Perception-for-Action-Control Theory (PACT) posits, based

on neurological and phonetic evidence showing that humans actively turn *heard* phonetic sounds into motor action through our pre-motor circuitry, that our acoustic systems were adapted for *pre-linguistic* functions involving mimicry (Schwartz et al. 2012, Schwartz, Boë, and Abry 2007). As Schwartz, Boë, and Abry (2007) argues, “PACT assumes that speech perception not only allows listeners to follow the vocalizations...in order to understand them, but also to imitate and learn.” Although the original proponents of this theory have argued that this drive for vocal imitation may be in place to help with language acquisition, it remains difficult to explain why this pre-motor system remains in humans *past* development, and future work is required to elucidate what PACT’s primary function is. Furthermore, lesion studies by Hickock & Poeppel (2004, 2007) have shown that this system is not *required* for language acquisition, leaving room for other hypotheses.

In many other species, the ability to have plastic vocal signals is directly associated with learning, particularly in courting contexts, indicating a causal role for sexual selection. Yet in primates this does not seem to be the case, as in gibbons sexual selection and vocal drivers are associated with behavioral ritualization and increased stereotypy (Terleph, Malaivijitnond, and Reichard 2018). Indeed, it is the case for many bird species that it is the faithful copying of complex local dialects (rather than plastic innovation) that is the pertinent signal for female choice, as signal fidelity may be an indicator of early life stress in songbirds (Nowicki, Searcy, and Peters 2002) and female choice actively selects against innovation (Nowicki et al. 2001, Lachlan, Ratmann, and Nowicki 2018). A better analogy may be found in the open-ended trial-and-error and prey-specific plastic behaviors we see in *Portia* jumping spiders employed in hunting contexts (Jackson and Nelson 2011). In this light, the plastic substrate for language arose not unlike that seen in parrot’s, save for being employed in a number of useful contexts

independent of courtship; see Bradbury and Balsby (2016) for a review of foraging-related hypotheses for parrot communication- most involve signaling the presence of unique patches of *hard-to-obtain* food specific to the parrot diet.

While vocal aggressive mimicry can help explain vocal plasticity in humans, it is not the only proximate mechanism available. For example, Falk (2004) and Mehr and Krasnow (2017) propose that vocal plasticity arose through mother-infant interactions and runaway selection due to demands for attention infants place on their mothers. Different in this hypothesis from the currently presented one is the absence of a mechanism for learning and plasticity, instead vocalizations are said to have arisen due to the demands of the infant neurological system, rather than random externalities. Alternatively, the technological pedagogy hypothesis proposed by Stout and Chaminade (2012) provides a mechanism for learning in-line with the cultural brain hypothesis. Simply described, humans developed neural plasticity to create referents for the purpose of teaching the instructions for building tools. Unlike in primates, when building a tool, one cannot use one referent for several objects as ambiguity in the case of interpreting mental communicative “blueprints” can lead to breakdown of instructions and the fidelity of tool constructions entirely. Although a relatively comprehensive hypothesis, the timing of events in terms of the slow, stepwise evolution of anatomical structures necessary for languages in humans does not necessarily match the proposed onset for the evolution of cumulative cultural learning (Stout 2018). It is likely that this hypothesis plays a role in language evolution, but that this does not develop until *after* the evolution of neural plasticity in humans with vocal plasticity coming first, referential communication coming later; again see Bradbury and Balsby (2016) for examples of foraging-specific plasticity in parrots without referential systems.

## Modeling Theory of Mind

Despite the objections regarding human language above, theory of mind is still nonetheless important for the evolution of the human brain and for sharing information. As discussed, there is evidence that great apes exhibit theory of mind but not on the level as it is exhibited in humans. Aside from the general idea that higher-order social tracking with theory of mind may naturally arise from increased encephalization, one can see, like with the example of language, how it is that a limited version of fictioneering may have arisen from an ecological context through aggressive mimicry.

The use of ToM in many, if not most, cases of aggressive mimicry are difficult to determine, as these may have arisen via direct copying of aggressive mimicry rather than actual consideration of a prey item's mindset. Barrett (2019) considers cases employing magic as a potential route for this involving the scaring of predators, in this case a hawk, as one such case study, "My dad used to tell me that his grandfather made him sing the song to the *gavilan* (hawk) so that he wouldn't make the other animals wary....the *gavilan* flies and the partridges hide, the monkeys hide, saying he was going to catch them....to go before the *gavilan* went, they would sing like this to the *gavilan*...So that the *gavilan* doesn't go, they sing the song so that he goes somewhere else. They tell him that over there is more hunting...they say it like that. Thus, the *gavilan* goes the other way. Through the song they trick him." Viewed through this example, Shuar hunter-gatherers can be seen as employing at least two separate types of strategies that could or could not employ theory of mind.

In one sense, the level of reasoning required to know that scaring off a hawk will scare off other predators does not necessarily require ToM. One simply needs to understand the relationship of the hawk to other animals in its environment, and even then such behaviors can

simply be copied and not understood, although Barrett (2004) argues that most of these relationships are the result of reasoning in children rather than simply copied behaviors. But in the conclusion, the Shuar hunter gives it away in his last sentence: “through the song they trick him.” Although not quantified here, it seems many examples of cognitive aggressive mimicry in humans comes with the full knowledge of a deceived animal’s mental state.

Several example from the literature compiled here evidenced an understanding of animals’ mindsets when deceiving them. The Semai of Southeast Asia, for example, refused to use the proper names of animals they were hunting while hunting them under the guise that most animals know their true name. As noted by Dentan (1968), “The east Semai do not use the real ‘name’ of an animal they are hunting or eating...Instead of defying something that threatens them, the Semai try to deceive it.” Similarly, among the Mbuti (pygmy) foragers of West Africa, Turnbull (1976) noted that many magical rituals invoking animal spirits were, “believed to convey to the hunter the senses of the animal so that he will be able to deceive the animal as well as foresee his movements.” The ability of hunters to understand the mindset of the animals they are hunting both in hunting and in ritual is taken to an extreme interpretation in the work of Rane Willerslev. In his book, *Soul Hunters* (2007), an ethnography of the Siberian Yukaghirs, Willerslev argues that the most common and most ancient of the world’s religions, animism, is in fact the practice of mimesis toward animals and nature. The symbolic dances, animal head rituals, and hunting magic as discussed by Barrett all form an intricate worldview where the gap between human and animal mind is not too large. In Willerslev (2004), he intricately argues that the origins of perspectivism (or the ability to distinguish between self and other) lie in mimetic practice, specifically the mimetic copying of prey, stating, “this capacity to take on the appearance and viewpoint of another species is one of the key aspects of being a person.”

Numerous such examples exist in the literature, as do examples to the contrary. Edward Horace Man (1932) records, regarding the Andaman Islanders, “They employ no stratagems for deceiving or decoying game, nor do they prepare snares or pitfalls for it.” Turney-High (1941) notes, “The Upper Kutenai admit that the Lower bands make decoys for water birds, *an art which they do not understand*. The Upper bands had no bird traps or snares.” Is it possible or likely then that theory-of-mind addressed towards prey is *culturally* created rather than innate? If so, what does this say for the evolution of human theory of mind? It could mean much or it could be very little. The tendency to view the presence of cross-cultural behavior or canalization as a sign of selection pressures is somewhat fallacious itself: the inability of a group of humans to create fire does not rule out the impact that fire and cooking have had on our biology (Wrangham and Conklin-Brittain 2003). The cases presented here are akin to the famous Tasmania case study by cultural evolutionist Joseph Henrich. In seeking to explain the lack of fire, textiles, and fishing apparatuses in early pre- and early-contact Tasmanians, Henrich (2004) argued that through the dynamics of cultural use, disuse, and demography that cultural innovations are often lost. This position is best elaborated by Heyes (2018) in her book Cognitive Gadgets; in her view, the selection pressure for an important cognitive trait does not necessarily force it to pop up everywhere. Likewise, the possibility that humans possess a general “deception module” which can be employed in ecological *or* social contexts (but must be learned for either), cannot be ruled out. It is notably bizarre that one of our most well-studied ethnographic populations, the Andaman Islanders, possess no forms of aggressive mimicry. Is it possible theory of mind employed as a *cognitive technology* in this way was lost?

When viewed this way, the case for aggressive mimicry as a potential driver of theory of mind may be overstated. One only needs to look to Western history to realize that it wasn’t until

Darwin's revelation of our commonality with animals that nearly all creatures were assumed to be virtually indistinguishable from automatons and lacking "mind." Whether this lack of confidence in the animal world is itself indicative of a Western mindset (note the common root between *animal* and *animinism*, the belief that natural phenomena have souls) would require a separate cross-cultural project outside of the scope of this project. It may equally be the case that the elevation of human souls in Christian doctrine turned Western humans against better insight. Human exceptionalism may also be the case for a limited number of non-Western cultures.

Central to this matter is that when aggressive mimicry is viewed as a generalized strategy employed against a number of prey in ecological situations, it's difficult to see how theory of mind could be a completely unnecessary component to the equation. In Clark's case, the magic song the Shuar employ against *gavilans* might be neutral and copied, while the intent is not. Likewise, the absence of aggressive mimicry in Andaman Islanders might simply reflect their marine-resource rich diet (a search of fish baiting – 981 paragraphs - may turn up very different from the search carried out here). On a more advanced level, referring to the earlier case of hunters in the Southeastern United States who whistle to mimic hawks, it seems at least three levels of theory of mind are employed: the hunter is thinking of the rabbit thinking of the hypothetical hawk (which, despite being a work of fiction, employs its own predictable beliefs/actions toward its signal to the rabbit). It is extremely difficult to find any non-human cases of theory of mind operating on three levels in general.

Although hard to describe (one would have to go on a case-by-case basis to identify whether a behavior signified intent), the data in this thesis attempted to capture behavior in one dimension adjacent to intent: an indirect behavior involves attracting a prey animal to an object aside from oneself. Such examples include breaking the legs of a kudu to attract other kudu in

the San, placing decoys such as the heads of killed bull elks to attract other male elks in the Chinookans of the Lower Columbia River, and the use of a distressed fish beating its body on the water by Lau Fijians to attract predatory fish and sharks. While still not a direct sign of intent, the presence of this asideness as a hunting strategy for 35.9% of cases which do not involve baiting (when baiting is included, indirect exploitations constitute 42.7% of all recorded strategies). Even direct examples indicate some form of asideness. As in the case of rabbit hunters in the Southeast, there are many examples of hunters mimicking prey to attract predators.

In any event, the problem of disentangling application of theory of mind through indirect luring effects and overall copying is not too different from this problem in storytelling: many stories are certainly copied and some are more complex than others, but in each case a *fictive event* is created in the process. A hunter employing a number of cases of aggressive mimicry against their prey often employs theory of mind inasmuch as a chimpanzee hiding food from a dominant conspecific is employing theory of mind, the difference here is that humans do it both against their conspecifics and their prey. Chimpanzee theory of mind often involves withholding information rather than creating falsehoods *per se*. What framework, aside from social drivers can explain the evolution of lying in humans? Aggressive mimicry is one.

Is it because of copying that humans create fictional worlds or is it because of perception of preys' mental states that this happens? This again goes back to the cart-and-horse question of whether complex behaviors were produced by sociality/copying or by ecological drivers. While this seems an insolvable question, there is a way past this, namely by asking where it is unique theories of mind are employed by humans and where they are not. Surely in copying behaviors and techniques, there is a form of abstraction that is used by humans: representation of the future and representation of objects are employed. Yet for copying, it is not necessary for representation



of mind to be employed. Chimpanzees exhibit theory of mind (and copying, to an extent), but do not exhibit fictioneering. It seems that in this case, fictioneering requires a completely separate selective pressure aside from copying and aside from mental withholding. I propose that ecologically driven behaviors aside from copying, such as aggressive mimicry, may be an answer to this and that none of these competing hypotheses are necessarily in opposition to one another.

### **Modeling Mental Evolution**

In examining the multiple hypotheses presented for the evolution of the mind, what insight can we gain by acknowledging the use of lying by humans against their prey? The Social Brain Hypothesis provides an elegant explanation for the evolution of lying and complex cognition, while the Foraging Brain Hypothesis provides an account through which human brains may have evolved. In some sense, each of the hypotheses presented may be looking at different sides of the same process. The use of lying against prey provides an ecologically, rather than socially, relevant use of deception meaning that social lying is not the only means through which deception could have evolved. Returning to the concept of “cognitive gadgets” as proposed by Heyes (2018), there is no reason to think that a general deceptive *ability* is what evolved in humans, rather than deception *for* specific means. Given this proposition, several scenarios for the evolution of deception (and human mentality, more generally) can be proposed.

For most expensive evolutionarily changes, as in the case of the human brain, there often needs to be an external driver. Potts’ (1998) variability selection hypothesis explains that many of the unique aspects of humans, both biological and behavioral probably arose as the result of *fluctuating* environments. Demands on humans in this environment drove them into a novel niche which involved both dietary plasticity and an emphasis on hard-to-obtain foods that other

animals (such as competing baboons) were not focused on. Potentially following this came adaptations for behavioral plasticity which necessitate 1) more expensive brains and 2) longer lifespans to afford such expenses (Kaplan et al. 2000) . From the expensive brain came more plastic behaviors including copying (Muthukrishna et al. 2018) and deception (Byrne and Whiten 1990) which were then employed in a more social setting leading to classic Machiavellian deception and language (the former constituting a spandrel, the latter constituting an exaptation). One potential model for the evolution of deception which emphasizes the role of environment and ecology (with the social applications of cognitive modules such as deception becoming *Machiavellian* deception following as an exaptation) is proposed in Figure 14, below.

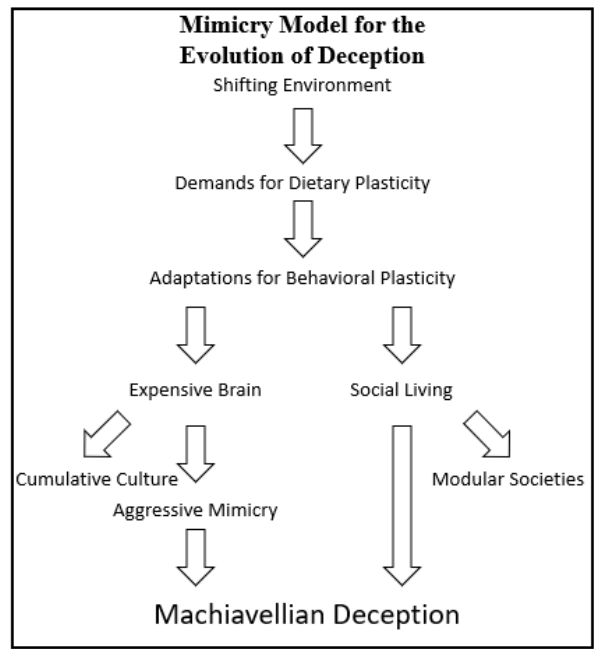


Figure 14. Mimicry Model of the Evolution of Deception.

Alternative models could be proposed as well: with the shifting environment came expensive brains, cumulative culture, social living, and increased creativity. With these also

came Machiavellian deception. Following Machiavellian deception, aggressive mimicry was co-opted and provided further benefits to our hominin ancestors. Likewise, it could be that both of these scenarios are wrong and these traits were concurrent with one another. Both of these scenarios are shown in Figure 15.

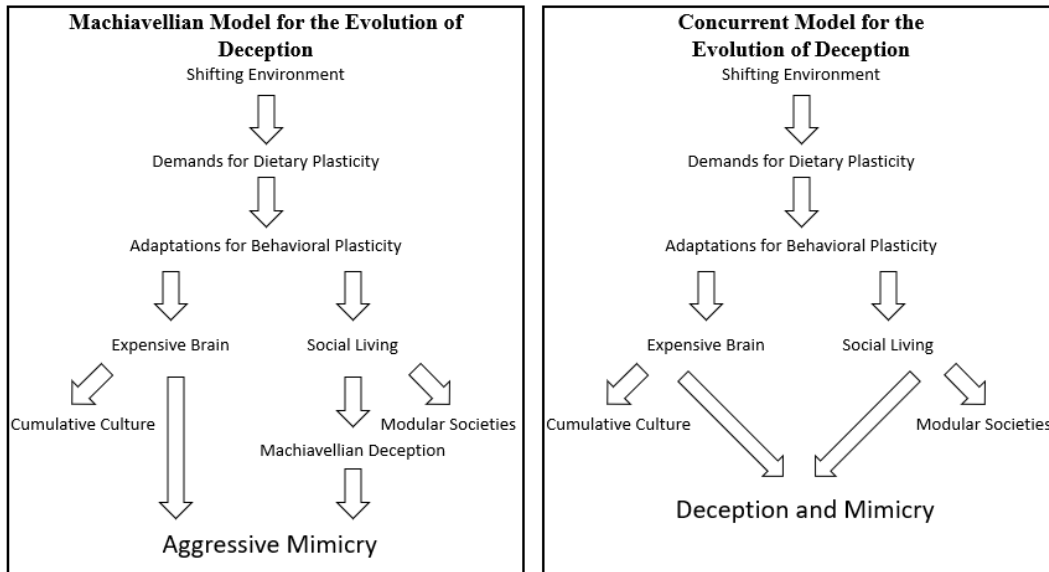


Figure 15. Machiavellian and Concurrent Models of the Evolution of Deception

Creating a proper model for trait-specific cognitive evolution requires further work and is dependent on the consideration of several questions: how is a trait used today? Is this trait adaptive? Is adaptation the only mechanism available for explaining the origins of this trait? Is the adaptive use of this trait in its *current* context a proper account of its origins? Would this trait have been adaptive in the past? If general cognitive modules, such as deception, are true, how do you delineate *which* of the contexts that this module is employed in is the one which drove it? If cognitive *gadgets*, which are completely plastic and non-canalized, are the appropriate analogy, what is the proper way of discussing the adaptive history these plastic traits had for us in our

evolutionary pass, if it is at all significant? Such questions are currently taking place in the cognitive sciences and are likely to yield fruitful conclusions in the future.

## CHAPTER VII CONCLUSIONS

The data here show that the use of cognitive aggressive mimicry is rare in the animal kingdom, but prevalent as a hunting strategy in humans. How central or essential it is for hunters cannot be quantified through ethnographic survey, but future studies can work to focus on this unique hunting strategy in modern hunters and its importance for hunting success. It will also be important to better quantify intent and the hunter-gatherer worldview towards the prey. Although several quotes were extracted supporting hunter-gatherer theory of mind toward their prey, a more systematic view would involve interviews specifically for the purpose of answering this question. Given the, “idea of pervading life and will in nature,” that is ever-present in animism (Tylor 1871), it may not be surprising to find that the Western idea of animals as automatons is a WEIRD concept. Additionally, using middle-range theory by comparing separate hunter-gatherer groups, one may be able to extrapolate pertinent information for the fossil and archaeological record to see how old this strategy may be.

Theoretically, the presence of this hunting strategy shows a potential route for human vocal plasticity and highlights how theory of mind is applied in human hunting, rather than human social contexts. Regarding the evolution of human cognition, the presence of this strategy may unify the superficially disparate approaches of the Social Brain Hypothesis and the Foraging Brain Hypothesis. A number of cognitive features such as deception, vocal plasticity, storytelling, and multi-leveled theory of mind easily could have arisen via a foraging brain later to be co-opted for the social purposes laid out by the SBH. While Dunbar (2009) makes the argument that humanity’s social brain arose due to increased predation pressures, it is more likely that human evolution operated the other way: it was *being* predators which gave humans a cognitive edge.

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## APPENDIX

### EHRAF TABLE

Culture	Continent	Region	Subsistence Type	Type of Lure	Exploitation	Lure Context	Type of Meat	Keyword	Source
<b>Ainu</b>	Asia	East Asia	Hunter-gatherers	Direct	Acoustic	?	Deer	Decoy*	Watanabe, Hitoshi. 1964. "Ainu: A Study Of Ecology And The System Of Social Solidarity Between Man And Nature In Relation To Group Structure." <i>Journal</i> . Tokyo: University of Tokyo.
<b>Ainu</b>	Asia	East Asia	Hunter-gatherers	Indirect	Bait	Group	Deer	Lure* Luring	Watanabe, Hitoshi. 1964. "Ainu: A Study Of Ecology And The System Of Social Solidarity Between Man And Nature In Relation To Group Structure." <i>Journal</i> . Tokyo: University of Tokyo.
<b>Ainu</b>	Asia	East Asia	Hunter-gatherers	Indirect	Visual	Individual	Fish	Decoy*	Batchelor, John. 1927. "Ainu Life And Lore: Echoes Of A Departing Race." Tokyo: Kyobunkwan.
<b>Akan</b>	Africa	Western Africa	Horticulturalists	Direct	Acoustic	Individual	Deer	Imitat*	Rattray, R. S. (Robert Sutherland). 1916. "Ashanti Proverbs: (The Primitive Ethics Of A Savage People)." Oxford, England: At the Clarendon Press.
<b>Akan</b>	Africa	Western Africa	Horticulturalists	Fishing	Fishing	Individual	Fish	Lure* Luring	Rattray, R. S. (Robert Sutherland). 1923. "Ashanti." Oxford, England: Clarendon Press.
<b>Aleut</b>	North America	Arctic and Subarctic	Hunter-gatherers	Direct	Acoustic	Individual	Seals	Lure* Luring	Shade, Charles I. 1949. "Ethnological Notes On The Aleuts."
<b>Aleut</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Mixed	Individual	Seals	Decoy*	Innokentii, Metropolitan of Moscow, Saint, Kolonna, Rossiisko-amerikanskaia kompaniia, B. Keen, and Assya Kardinelowka. 1840. "Notes On The Islands Of The Unalaska District." St. Petersburg: Russian-American Company.
<b>Alutiiq</b>	North America	Arctic and Subarctic	Hunter-gatherers	Direct	Acoustic	Individual	Deer	Decoy*	Birket-Smith, Kaj. 1953. "Chugach Eskimo." <i>Nationalmuseets Skrifter. Etnografisk Række</i> . København: Nationalmuseets publikationsfond.
<b>Alutiiq</b>	North America	Arctic and Subarctic	Hunter-gatherers	Direct	Acoustic	Individual	Birds	Decoy*	Birket-Smith, Kaj. 1953. "Chugach Eskimo." <i>Nationalmuseets Skrifter. Etnografisk Række</i> . København: Nationalmuseets publikationsfond.
<b>Alutiiq</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Bait	Individual	Fish	Lure* Luring	Hrdlicka, Ales. 1975. "Anthropology Of Kodiak Island." New York: AMS Press.
<b>Alutiiq</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Mixed	Individual	Seals	Decoy*	Birket-Smith, Kaj. 1953. "Chugach Eskimo." <i>Nationalmuseets Skrifter. Etnografisk Række</i> . København: Nationalmuseets publikationsfond.
<b>Alutiiq</b>	North America	Arctic and Subarctic	Hunter-gatherers	Direct	Visual	Individual	Seals	Decoy*	Clark, Donald Woodforde. 1984. "Pacific Eskimo: Historical Ethnography." <i>Handbook Of North American Indians. Arctic</i> . Washington, D.C.: Smithsonian Institution: For sale by the Supt. of Docs., U.S. G.P.O.
<b>Andamans</b>	Asia	South Asia	Hunter-gatherers	N/A	N/A	N/A	N/A	Decoy*	Man, Edward Horace. 1932. "On The Aboriginal Inhabitants Of The Andaman Islands." London: The Royal Anthropological Institute of Great Britain and Ireland.
<b>Aranda</b>	Oceania	Australia	Hunter-gatherers	Direct	Acoustic	Individual	Birds	Imitat*	Basedow, Herbert. 1925. "Australian Aboriginal." Adelaide: F. W. Preece and sons.

<b>Aranda</b>	Oceania	Australia	Hunter-gatherers	Direct	Acoustic	Individual	Dingos	Imitat*	Basedow, Herbert. 1925. "Australian Aboriginal." Adelaide: F. W. Preece and sons.
<b>Aranda</b>	Oceania	Australia	Hunter-gatherers	Indirect	Visual	Group	Kangaroos	Decoy*	Schulze, Louis Gustav, and J. G. O. Tepper. 1891. "Aborigines Of The Upper And Middle Finke River: Their Habits And Customs, With Introductory Notes On The Physical And Natural-History Features Of The Country." <i>Transactions And Proceedings And Reports Of The Royal Society Of South Australia</i> 14: 210–46.
<b>Assiniboine</b>	North America	Plains and Plateau	Hunter-gatherers	Direct	Acoustic	Group	Deer	Decoy*	Denig, Edwin Thompson, and J. N. B. (John Napoleon Brinton) Hewitt. 1930. "Indian Tribes Of The Upper Missouri." Washington D.C.: Government Printing Office
<b>Assiniboine</b>	North America	Plains and Plateau	Hunter-gatherers	Direct	Mixed	Group	Buffalo	Decoy*	Lowie, Robert Harry. 1909. "Assiniboine." <i>Anthropological Papers Of The American Museum Of Natural History</i> . New York: The Trustees.
<b>Assiniboine</b>	North America	Plains and Plateau	Hunter-gatherers	Direct	Visual	Group	Antelope	Decoy*	Denig, Edwin Thompson, and J. N. B. (John Napoleon Brinton) Hewitt. 1930. "Indian Tribes Of The Upper Missouri." Washington D.C.: Government Printing Office.
<b>Assiniboine</b>	North America	Plains and Plateau	Hunter-gatherers	Direct	Visual	Group	Buffalo	Lure* Luring	Ewers, John Canfield. 1983. "William Standing (1904-1951): Versatile Assiniboin Artist." <i>American Indian Art Magazine</i> 8 (4), [Scottsdale, Ariz.]: 54–63.; Lowie, Robert Harry. 1909. "Assiniboine." <i>Anthropological Papers Of The American Museum Of Natural History</i> . New York: The Trustees.
<b>Aymara</b>	South America	Central Andes	Horticulturalists	Direct	Acoustic	?	Ducks	Lure* Luring	Tschopik Jr, Harry. 1946. "Aymara." <i>Bulletin</i> . Washington, D.C.: Smithsonian Institution.
<b>Azande</b>	Africa	Central Africa	Horticulturalists	Direct	Vibration	Group	Termites	Deceive*	Schlippe, Pierre de. 1956. "Shifting Cultivation In Africa: The Zande System Of Agriculture." London: Routledge & Paul.
<b>Azande</b>	Africa	Central Africa	Horticulturalists	Indirect	Visual	Individual	Jackals	Deceive*	Schlippe, Pierre de. 1956. "Shifting Cultivation In Africa: The Zande System Of Agriculture." London: Routledge & Paul.
<b>Aztecs</b>	Middle America and Caribbean	Central Mexico	Intensive Agriculturalists	Indirect	Visual	Individual	Ducks	Lure* Luring	Brundage, Burr Cartwright. 1972. "Rain Of Darts: The Mexica Aztecs." <i>Texas Pan-American Series</i> . Austin & London: University of Texas Press.
<b>Banyoro</b>	Africa	Eastern Africa	Horticulturalists	Direct	Acoustic	Individual	Predators	Imitat*	Nyakatura, J. W. (John W.), and Zebiya Kwamya Rigby. 1970. "Aspects Of Bunyoro Customs And Tradition." Nairobi: East African Literature Bureau.
<b>Bedouin</b>	Middle East	Middle East	Pastoralists	Indirect	Visual	Individual	Birds	Decoy*	Dickson, H. R. P. (Harold Richard Patrick). 1951. "Arab Of The Desert : A Glimpse Into Badawin Life In Kuwait And Sau'Di Arabia." London: George Allen & Unwin Ltd.
<b>Bemba</b>	Africa	Southern Africa	Horticulturalists	Direct	Acoustic	Individual	Duiker	Imitat*	Richards, Audrey I. (Audrey Isabel). 1939. "Land, Labour And Diet In Northern Rhodesia: An Economic Study Of The Bemba Tribe." Pub. for the International Institute of African Languages & Cultures by the Oxford University Press.
<b>Bemba</b>	Africa	Southern Africa	Horticulturalists	Direct	Acoustic	Individual	Duiker	Imitat*	Richards, Audrey I. (Audrey Isabel). 1939. "Land, Labour And Diet In Northern Rhodesia: An Economic Study Of The Bemba Tribe." Pub. for the International Institute of African Languages & Cultures by the Oxford University Press.
<b>Blackfoot</b>	North America	Plains and Plateau	Hunter-gatherers	Direct	Acoustic	Group	Buffalo	Lure* Luring	Conaty, Gerald T. 1995. "Comments And Reflections: Economic Models And Blackfoot

									Ideology." <i>American Ethnologist</i> 22 (2). [Washington]: 403-12.
<b>Blackfoot</b>	North America	Plains and Plateau	Hunter-gatherers	Direct	Visual	Group	Buffalo	Decoy*	Forde, Cyril Daryl. 1950. "Blackfoot: Buffalo Hunters Of The North American Plains." <i>Habitat, Economy And Society ; A Geographical Introduction To Ethnology</i> . London: Methuen ; Dutton.
<b>Blackfoot</b>	North America	Plains and Plateau	Hunter-gatherers	Direct	Visual	Group	Antelope	Decoy*	Schultz, James Willard, 1859-1947.
<b>Blackfoot</b>	North America	Plains and Plateau	Hunter-gatherers	Direct	Visual	Group	Buffalo	Lure* Luring	Ewers, John Canfield. 1958. "Blackfeet: Raiders Of The Northwestern Plains." <i>Civilization Of The American Indian</i> . Norman: University of Oklahoma Press.;Grinnell, George Bird. 1962. "Blackfoot Lodge Tales: The Story Of A Prairie People." Lincoln: University of Nebraska Press.;Kehoe, Alice Beck. 1995. "Blackfoot Persons." <i>Women And Power In Native North America</i> . Norman: University of Oklahoma Press.
<b>Bororo</b>	South America	Eastern South America	Hunter-gatherers	Direct	Acoustic	?	?	Mimic*	Fabian, Stephen Michael. 1992. "Space-Time Of The Bororo Of Brazil." Gainesville, Fla.: University Press of Florida.
<b>Botocudo</b>	South America	Eastern South America	Hunter-gatherers	Direct	Acoustic	Individual	?	Imitat*	Métraux, Alfred. 1946. "Botocudo." <i>Handbook Of South American Indians, Edited By Julian H. Steward</i> . Washington, D.C.: U.S. G.P.O.
<b>Burmans</b>	Asia	Southeast Asia	Intensive Agriculturalists	Direct	Acoustic	Group	Deer	Deceive*	Ferrars, Max, and Bertha Ferrars. 1901. "Burma." London: Sampson Low, Marston and Company..
<b>Burmans</b>	Asia	Southeast Asia	Intensive Agriculturalists	Indirect	Bait	Group	Elephants	Decoy*	Ferrars, Max, and Bertha Ferrars. 1901. "Burma." London: Sampson Low, Marston and Company.
<b>Burmans</b>	Asia	Southeast Asia	Intensive Agriculturalists	Indirect	Mixed	Group	Birds	Lure* Luring	Scott Sir, James George. 1910. "Burman: His Life And Notions." London: Macmillan and Co.
<b>Cajuns</b>	North America	Regional and Ethnic Cultures	Other Subsistence Combinations	Indirect	?	Individual	Conch larvae	Lure* Luring	Rushton, William Faulkner. 1979. "Cajuns: From Acadia To Louisiana." New York: Farrar Straus Giroux.
<b>Cajuns</b>	North America	Regional and Ethnic Cultures	Other Subsistence Combinations	Indirect	Visual	Individual	Birds	Decoy*	Gutierrez, C. Paige. 1992. "Cajun Foodways." Jackson, Miss.: University Press of Mississippi.
<b>Cambodians</b>	Asia	Southeast Asia	Intensive Agriculturalists	Indirect	Mixed	Individual	Birds	Lure* Luring	Zhou, Dagan, fl. 1297, Paul Pelliot, and J. G. D'Arcy (John Gilman D'Arcy) Paul. 1987. "Customs Of Cambodia." Bankok: The Siam Society.
<b>Canela</b>	South America	Eastern South America	Hunter-gatherers	Indirect	Bait	Individual	Parrots	Lure* Luring	Nimuendaju, Curt, and Robert Harry Lowie. 1946. "Eastern Timbira." <i>University Of California Publications In American Archaeology And Ethnology</i> . Berkeley And Los Angeles: Universtiy of California Press. so08-001.
<b>Cherokee</b>	North America	Eastern Woodlands	Other Subsistence Combinations	Direct	Acoustic	Individual	Turkeys	Decoy*	Speck, Frank G. (Frank Gouldsmith), Leonard Broom, and Will West Long. 1983. "Cherokee Dance And Drama." <i>Civilization Of The American Indian Series</i> . Norman: University of Oklahoma Press.
<b>Cherokee</b>	North America	Eastern Woodlands	Other Subsistence Combinations	Direct	Acoustic	?	Deer	Decoy*	Speck, Frank G. (Frank Gouldsmith), Leonard Broom, and Will West Long. 1983. "Cherokee Dance And Drama." <i>Civilization Of The American Indian Series</i> . Norman: University of Oklahoma Press. nn08-002.
<b>Cherokee</b>	North America	Eastern Woodlands	Other Subsistence Combinations	Direct	Acoustic	Individual	Birds	Imitat*	White, Max Edgar. 1987. "Ethnoarchaeological Approach To Cherokee Subsistence And Settlement



									Patterns." Ann Arbor, Michigan: University Microfilms International.
<b>Cherokee</b>	North America	Eastern Woodlands	Other Subsistence Combinations	Indirect	Bait	Individual	Fish	Lure* Luring	Kilpatrick, Jack Frederick, and Anna Gritts Kilpatrick. 1967. "Run Toward The Nightland: Magic Of The Oklahoma Cherokees." Dallas: Southern Methodist University Press.
<b>Cherokee</b>	North America	Eastern Woodlands	Other Subsistence Combinations	Indirect	Bait	Individual	Deer	Lure* Luring	Kilpatrick, Jack Frederick, and Anna Gritts Kilpatrick. 1967. "Run Toward The Nightland: Magic Of The Oklahoma Cherokees." Dallas: Southern Methodist University Press.
<b>Cherokee</b>	North America	Eastern Woodlands	Other Subsistence Combinations	Direct	Visual	Individual	Deer	Decoy*	Speck, Frank G. (Frank Gouldsmith), Leonard Broom, and Will West Long. 1983. "Cherokee Dance And Drama." <i>Civilization Of The American Indian Series</i> . Norman: University of Oklahoma Press.
<b>Cherokee</b>	North America	Eastern Woodlands	Other Subsistence Combinations	Direct	Visual	Individual	Buffalo	Decoy*	Speck, Frank G. (Frank Gouldsmith), Leonard Broom, and Will West Long. 1983. "Cherokee Dance And Drama." <i>Civilization Of The American Indian Series</i> . Norman: University of Oklahoma Press.
<b>Cherokee</b>	North America	Eastern Woodlands	Other Subsistence Combinations	Direct	Visual	Individual	Bears	Decoy*	Speck, Frank G. (Frank Gouldsmith), Leonard Broom, and Will West Long. 1983. "Cherokee Dance And Drama." <i>Civilization Of The American Indian Series</i> . Norman: University of Oklahoma Press.
<b>Cherokee</b>	North America	Eastern Woodlands	Other Subsistence Combinations	Direct	Visual	Individual	Deer	Lure* Luring	Speck, Frank G. (Frank Gouldsmith), Leonard Broom, and Will West Long. 1983. "Cherokee Dance And Drama." <i>Civilization Of The American Indian Series</i> . Norman: University of Oklahoma Press.
<b>Chinookans of the Lower Columbia River</b>	North America	Northwest Coast and California	Hunter-gatherers	Direct	Acoustic	?	Elk	Decoy*	Ray, Verne Frederick. 1938. "Lower Chinook Ethnographic Notes." <i>University Of Washington Publications In Anthropology</i> . Seattle: University of Washington.
<b>Chinookans of the Lower Columbia River</b>	North America	Northwest Coast and California	Hunter-gatherers	?	Visual	?	Elk	Decoy*	Ray, Verne Frederick. 1938. "Lower Chinook Ethnographic Notes." <i>University Of Washington Publications In Anthropology</i> . Seattle: University of Washington.
<b>Chinookans of the Lower Columbia River</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Visual	Individual	Fish	Lure* Luring	Ray, Verne Frederick. 1938. "Lower Chinook Ethnographic Notes." <i>University Of Washington Publications In Anthropology</i> . Seattle: University of Washington.
<b>Chinookans of the Lower Columbia River</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Visual	Individual	Deer	Lure* Luring	Ruby, Robert H., and John Arthur Brown. 1976. "Chinook Indians: Traders Of The Lower Columbia River." <i>Civilization Of The American Indian Series</i> . Norman: University of Oklahoma Press.
<b>Chipewyans</b>	North America	Arctic and Subarctic	Hunter-gatherers	Direct	Acoustic	Individual	Moose	Decoy*	Birket-Smith, Kaj. 1930. "Contributions To Chipewyan Ethnology." <i>Report</i> . Copenhagen: Gyldendalske Boghandel, Nordisk Forlag.
<b>Chipewyans</b>	North America	Arctic and Subarctic	Hunter-gatherers	Direct	Acoustic	Individual	Caribou	Decoy*	Birket-Smith, Kaj. 1930. "Contributions To Chipewyan Ethnology." <i>Report</i> . Copenhagen: Gyldendalske Boghandel, Nordisk Forlag.
<b>Chipewyans</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Bait	Individual	Beavers	Lure* Luring	Irimoto, Takashi. 1981. "Chipewyan Ecology: Group Structure And Caribou Hunting System." <i>Senri Ethnological Studies</i> . Osaka, Japan: National Museum of Ethnology.

<b>Chipewyans</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Visual	Individual	Foxes	Decoy*	Birket-Smith, Kaj. 1930. "Contributions To Chipewyan Ethnology." <i>Report</i> . Copenhagen: Gyldendalske Boghandel, Nordisk Forlag.
<b>Chorote</b>	South America	Southern South America	Hunter-gatherers	Direct	Acoustic	Individual	?	Decoy*	Rosen, Eric von. 1924. "Ethnographical Research Work During The Swedish Chaco-Cordillera Expedition, 1901-1902." Stockholm: C. E. Fritze, Ltd.
<b>Chukchee</b>	Asia	North Asia	Pastoralists	Indirect	Olfactory	Group	Reindeer	Decoy*	Antropova, V. V., and V. G. Kuznetsova. 1964. "Chukchi." <i>Peoples Of Siberia</i> . Chicago And London: University of Chicago Press.
<b>Chukchee</b>	Asia	North Asia	Pastoralists	Direct	Visual	Individual	Seals	Imitat*	Antropova, V. V., and V. G. Kuznetsova. 1964. "Chukchi." <i>Peoples Of Siberia</i> . Chicago And London: University of Chicago Press.
<b>Chukchee</b>	Asia	North Asia	Pastoralists	Direct	Visual	Individual	Reindeer	Lure* Luring	Bogoraz-Tan, Waldemar, Vladimir Germanovich (Bogoras. 1909. "Chukchee: Material Culture [Part 1], Religion [Part 2], Social Organization [Part 3]." <i>Memoirs</i> . Leiden: E. J. Brill, Ltd. ; G. E. Stechert and Co.
<b>Chukchee</b>	Asia	North Asia	Pastoralists	Direct	Visual	Individual	Fish	Lure* Luring	Antropova, V. V., and V. G. Kuznetsova. 1964. "Chukchi." <i>Peoples Of Siberia</i> . Chicago And London: University of Chicago Press.
<b>Chuuk</b>	Oceania	Micronesia	Other Subsistence Combinations	Indirect	Fishing	Individual	Fish	Lure* Luring	Bollig, Laurentius. 1927. "Inhabitants Of The Truk Islands: Religion, Life And A Short Grammar Of A Micronesian People." Munster I W.: Aschendorff. LeBar, Frank M. "Material Culture Of Truk."
<b>Chuuk</b>	Oceania	Micronesia	Other Subsistence Combinations	Direct	Visual	?	Fish	Lure* Luring	Bollig, Laurentius. 1927. "Inhabitants Of The Truk Islands: Religion, Life And A Short Grammar Of A Micronesian People." Munster I W.: Aschendorff.
<b>Chuuk</b>	Oceania	Micronesia	Other Subsistence Combinations	Indirect	Visual	Individual	Fish	Deceive*	Bollig, Laurentius. 1927. "Inhabitants Of The Truk Islands: Religion, Life And A Short Grammar Of A Micronesian People." Munster I W.: Aschendorff.
<b>Comanche</b>	North America	Plains and Plateau	Hunter-gatherers	Indirect	Mixed	Individual	Horses	Lure* Luring	Wallace, Ernest, and E. Adamson (Edward Adamson) Hoebel. 1952. "Comanches: Lords Of The South Plains." <i>Civilization Of The American Indian Series</i> . Norman: University of Oklahoma Press.
<b>Comanche</b>	North America	Plains and Plateau	Hunter-gatherers	Direct	Visual	Group	Buffalo	Decoy*	Wallace, Ernest, and E. Adamson (Edward Adamson) Hoebel. 1952. "Comanches: Lords Of The South Plains." <i>Civilization Of The American Indian Series</i> . Norman: University of Oklahoma Press.
<b>Copper Inuit</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Acoustic	Individual	Foxes	Lure* Luring	Jenness, Diamond. 1959. "People Of The Twilight." Chicago, Ill.: University of Chicago Press.
<b>Copper Inuit</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Fishing	Individual	Fish	Lure* Luring	Merwin, B. W. 1915. "Copper Eskimo." <i>Museum Journal</i> . Philadelphia, Pa.: The University Museum, University of Pennsylvania.
<b>Copper Inuit</b>	North America	Arctic and Subarctic	Hunter-gatherers	Direct	Visual	Group	Deer	Imitat*	Jenness, Diamond. 1922. "Life Of The Copper Eskimos." <i>Report Of The Canadian Arctic Expedition, 1913-1918</i> . Ottawa, Ont.: F.A. Acland.
<b>Copper Inuit</b>	North America	Arctic and Subarctic	Hunter-gatherers	Direct	Visual	Group	Caribou	Lure* Luring	Jenness, Diamond. 1959. "People Of The Twilight." Chicago, Ill.: University of Chicago Press.
<b>Copper Inuit</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Visual	Individual	Fish	Lure* Luring	Damas, David. 1984. "Copper Eskimo." <i>Handbook Of North American Indians. Arctic</i> . Washington, D.C.: Smithsonian Institution: For sale by the Supt. of Docs., U.S. G.P.O.;Pryde, Duncan. 1972. "Nunaga: My Land, My Country." Edmonton, Alta.: M.G. Hurtig Ltd.

<b>Creek</b>	North America	Eastern Woodlands	Primarily Hunter-Gatherers	Direct	Acoustic	Individual	Deer	Imitat*	Walker, Willard. 2004. "Creek Confederacy Before Removal." <i>Handbook Of North American Indians. Southeast</i> . Washington, D. C.: Smithsonian Institution : For sale by the Supt. of Docs., U.S. G.P.O.
<b>Crow</b>	North America	Plains and Plateau	Hunter-gatherers	Direct	Acoustic	Group	Buffalo	Lure* Luring	Lowie, Robert Harry. 1922. "Religion Of The Crow Indians." <i>Anthropological Papers Of The American Museum Of Natural History</i> . New York: The Trustees American Museum of Natural History.
<b>Delaware</b>	North America	Eastern Woodlands	Primarily Hunter-Gatherers	Direct	Acoustic	Individual	Deer	Imitat*	Herman, Mary W. 1950. "Reconstruction Of Aboriginal Delaware Culture From Contemporary Sources." <i>Kroeber Anthropological Society Papers</i> 1: 45-77.
<b>Delaware</b>	North America	Eastern Woodlands	Primarily Hunter-Gatherers	Indirect	Bait	Individual	Otters	Lure* Luring	Tantaquidgeon, Gladys, and Pennsylvania Historical Commission. 1942. "Study Of Delaware Indian Medicine Practice And Folk Beliefs." Harrisburg, Commonwealth Of Pennsylvania: Dept. of Public Instruction, Pennsylvania Historical Commission.
<b>Delaware</b>	North America	Eastern Woodlands	Primarily Hunter-Gatherers	Indirect	Olfactory	Individual	Beavers	Decoy*	Zeisberger, David, Archer Butler Hulbert, and William Nathaniel Schwarze. 1910. "David Zeisberger'S History Of Northern American Indians." <i>Ohio Archaeological And Historical Publications</i> . Columbus, Ohio: Published for the Society by Fred J. Heer.
<b>Dogon</b>	Africa	Southern Africa	Horticulturalists	Direct	Acoustic	Individual	Birds	Imitat*	Griaule, Marcel, and Michael A. Marcus. 1938. "Dogon Games." <i>Travaux Et Mémoires</i> . Paris: Institut d'Ethnologie.
<b>Dogon</b>	Africa	Western Africa	Intensive Agriculturalists	Direct	Acoustic	Individual	Mice	Lure* Luring	Parin, Paul, Fritz Morgenthaler, Goldy Parin-Matthey, and Frieda Schütze. 1963. "Whites Think Too Much: Psychoanalytic Investigations Among The Dogon In West Africa." Zurich: Atlantis Verlag.
<b>Eastern Apache</b>	North America	Southwest and Basin	Hunter-gatherers	Direct	Visual	Individual	Deer	Imitat*	Opler, Morris Edward. 1941. "Apache Life-Way: The Economic, Social, And Religious Institutions Of The Chiricahua Indians." Chicago: University of Chicago Press.
<b>Eastern Apache</b>	North America	Southwest and Basin	Hunter-gatherers	Direct	Visual	Individual	Antelope	Imitat*	Opler, Morris Edward. 1941. "Apache Life-Way: The Economic, Social, And Religious Institutions Of The Chiricahua Indians." Chicago: University of Chicago Press.
<b>Eastern Toraja</b>	Asia	Southeast Asia	Horticulturalists	Direct	Acoustic	Individual	Birds	Decoy*	Adriani, Nicolaus, and Albertus Christiaan Kruijt. 1951. "Bare'E-Speaking Toradja Of Central Celebes (The East Toradja): Third Volume." <i>Verhandelingen</i> . Amsterdam: Noord-Hollandsche Uitgevers Maatschappij.
<b>Eastern Toraja</b>	Asia	Southeast Asia	Horticulturalists	Indirect	Bait	Group	Buffalo	Decoy*	Adriani, Nicolaus, and Albertus Christiaan Kruijt. 1951. "Bare'E-Speaking Toradja Of Central Celebes (The East Toradja): Third Volume." <i>Verhandelingen</i> . Amsterdam: Noord-Hollandsche Uitgevers Maatschappij.
<b>Eastern Toraja</b>	Asia	Southeast Asia	Horticulturalists	Indirect	Bait	Individual	Birds	Decoy*	Adriani, Nicolaus, and Albertus Christiaan Kruijt. 1951. "Bare'E-Speaking Toradja Of Central Celebes (The East Toradja): Second Volume." <i>Verhandelingen</i> . Amsterdam: Noord-Hollandsche Uitgevers Maatschappij.
<b>Eastern Toraja</b>	Asia	Southeast Asia	Horticulturalists	Indirect	Mixed	Individual	Birds	Lure* Luring	Adriani, Nicolaus, and Albertus Christiaan Kruijt. 1951. "Bare'E-Speaking Toradja Of Central Celebes

									(The East Toradja): Third Volume.” <i>Verhandelingen</i> . Amsterdam: Noord-Hollandsche Uitgevers Maatschappij
<b>Eastern Toraja</b>	Asia	Southeast Asia	Horticulturalists	Indirect	Mixed	Group	Birds	Lure* Luring	Adriani, Nicolaus, and Albertus Christiaan Kruijt. 1951. “Bare’E-Speaking Toradja Of Central Celebes (The East Toradja): Third Volume.” <i>Verhandelingen</i> . Amsterdam: Noord-Hollandsche Uitgevers Maatschappij.
<b>Eastern Toraja</b>	Asia	Southeast Asia	Horticulturalists	Indirect	Mixed	Individual	Birds	Imitat*	Adriani, Nicolaus, and Albertus Christiaan Kruijt. 1951. “Bare’E-Speaking Toradja Of Central Celebes (The East Toradja): Third Volume.” <i>Verhandelingen</i> . Amsterdam: Noord-Hollandsche Uitgevers Maatschappij
<b>Eastern Toraja</b>	Asia	Southeast Asia	Horticulturalists	Direct	Vibration	Individual	Woodpeckers	Imitat*	Adriani, Nicolaus, and Albertus Christiaan Kruijt. 1951. “Bare’E-Speaking Toradja Of Central Celebes (The East Toradja): Third Volume.” <i>Verhandelingen</i> . Amsterdam: Noord-Hollandsche Uitgevers Maatschappij.
<b>Fox</b>	North America	Eastern Woodlands	Primarily Hunter- Gatherers	Indirect	Bait	Individual	Mink	Lure* Luring	Smith, Huron H. (Huron Herbert). 1928. “Ethnobotany Of The Meskwaki Indians.” <i>Bulletin</i> . Milwaukee, Wis.: Pub. by order of the board of trustees of the Public Museum of the City of Milwaukee.
<b>Gros Ventre</b>	North America	Plains and Plateau	Hunter-gatherers	Direct	Visual	Group	Buffalo	Decoy*	Flannery, Regina. 1953. “Gros Ventres Of Montana: Part 1, Social Life.” <i>Catholic University Of America. Anthropological Series</i> . Washington: Catholic University of America Press.
<b>Guaraní</b>	South America	Eastern South America	Other Subsistence Combinations	Direct	Acoustic	Individual	Parrots	Imitat*	Schaden, Egon, and Lars-Peter Lewinsóhn. 1962. “Fundamental Aspects Of Guaraní Culture.” <i>Corpo E Alma Do Brasil</i> . Sao Paulo: Difusao Européia do Livro.
<b>Guaraní</b>	South America	Eastern South America	Other Subsistence Combinations	Direct	Acoustic	Individual	Monkey	Imitat*	Schaden, Egon, and Lars-Peter Lewinsóhn. 1962. “Fundamental Aspects Of Guaraní Culture.” <i>Corpo E Alma Do Brasil</i> . Sao Paulo: Difusao Européia do Livro.
<b>Haida</b>	North America	Northwest Coast and California	Hunter-gatherers	Direct	Acoustic	Individual	Deer	Lure* Luring	Murdock, George Peter. 1934. “Haidas Of British Columbia.” <i>Our Primitive Contemporaries</i> . New York: The Macmillian Company.
<b>Havasupai</b>	North America	Southwest and Basin	Other Subsistence Combinations	Direct	Acoustic	Group	Deer	Lure* Luring	Smithson, Carma Lee, and Robert C. Euler. 1964. “Havasupai Religion And Mythology.” <i>Anthropological Papers</i> . Salt Lake City: University of Utah Press.
<b>Havasupai</b>	North America	Southwest and Basin	Other Subsistence Combinations	Direct	Visual	?	Antelope	Mimic*	Spier, Leslie. 1928. “Havasupai Ethnography.” <i>Anthropological Papers Of The American Museum Of Natural History</i> . New York City: The Trustees.
<b>Hawaiians</b>	Oceania	Polynesia	Other Subsistence Combinations	Direct	Acoustic	Individual	Birds	Imitat*	Kamakau, Samuel Manaiakalani, Dorothy B. Barrère, and Mary Kawena Pukui. 1976. “Works Of The People Of Old =: Na Hana A Ka Po’E Kahiko.” <i>Bernice P. Bishop Museum Special Publication</i> . Honolulu: Bishop Museum Press..
<b>Hawaiians</b>	Oceania	Polynesia	Other Subsistence Combinations	Fishing	Fishing	Individual	Fish	Decoy*	Beckwith, Martha Warren, and Katharine Loumala. 1970. “Hawaiian Mythology.” Honolulu: University of Hawaii Press.
<b>Hawaiians</b>	Oceania	Polynesia	Other Subsistence Combinations	Indirect	Visual	Individual	Fish	Lure* Luring	Buck, Peter Henry. 1957. “Arts And Crafts Of Hawaii.” <i>Special Publication</i> . Honolulu: Bishop Museum Press..Handy, E. S. Craighill (Edward Smith Craighill), Elizabeth Green Handy, and Mary

									Kawena Pukui. 1972. "Native Planters In Old Hawaii: Their Life, Lore, And Environment." Bernice P. Bishop Museum Bulletin. Honolulu: Bishop Museum Press. ;Kamakau, Samuel Manaiakalani, Dorothy B. Barrère, and Mary Kawena Pukui. 1976. "Works Of The People Of Old =: Na Hana A Ka Po'E Kahiko." Bernice P. Bishop Museum Special Publication. Honolulu: Bishop Museum Press.
<b>Hawaiians</b>	Oceania	Polynesia	Other Subsistence Combinations	Indirect	Visual	Individual	Fish	Mimic*	Buck, Peter Henry. 1957. "Arts And Crafts Of Hawaii." <i>Special Publication</i> . Honolulu: Bishop Museum Press.
<b>Hopi</b>	North America	Southwest and Basin	Intensive Agriculturalists	Direct	Acoustic	Individual	Deer	Decoy*	Whiting, Alfred F. 1939. "Ethnobotany Of The Hopi." <i>Bulletin</i> . Flagstaff: Northern Arizona Society of Science and Art.
<b>Hopi</b>	North America	Southwest and Basin	Intensive Agriculturalists	Direct	Acoustic	Individual	Birds	Imitat*	Ellis, Florence Hawley. 1974. "Hopi: Their History And Use Of Lands." <i>Hopi Indians, Compiled And</i> . New York: Garland Publishing, Inc.
<b>Hopi</b>	North America	Southwest and Basin	Intensive Agriculturalists	Indirect	Bait	Group	Birds	Lure* Luring	Ellis, Florence Hawley. 1974. "Hopi: Their History And Use Of Lands." <i>Hopi Indians, Compiled And</i> . New York: Garland Publishing, Inc.
<b>Huichol</b>	Middle America and Caribbean	Northern Mexico	Other Subsistence Combinations	Direct	Acoustic	Group	Deer	Decoy*	Lumholtz, Carl. 1973. "Unknown Mexico: A Record Of Five Years' Exploration Among The Tribes Of The Western Sierra Madre; In The Tierra Calientes Of Tepic And Jalisco; And Among The Tarascos Of Michoacan -- Vol. 2." <i>Antiquities Of The New World</i> . New York: Published by AMS Press for Peabody Museum of Archaeology and Ethnology, Harvard University.
<b>Huichol</b>	Middle America and Caribbean	Northern Mexico	Other Subsistence Combinations	Indirect	Bait	Individual	Birds	Decoy*	Lumholtz, Carl. 1902. "Unknown Mexico: A Record Of Five Years Exploration Of The Western Sierra Madre ; In The Tierra Caliente Of Tepic And Jalisco ; And Among The Tarascos Of Michoacan, Vol. 1." New York: Charles Scribners' Sons.
<b>Ifugao</b>	Asia	Southeast Asia	Intensive Agriculturalists	Direct	Acoustic	Individual	Birds	Imitat*	Lambrech, Francis. 1957. "Mayawyaw Ritual: Vii. Hunting And Its Ritual." <i>Journal Of East Asiatic Studies</i> 6 (1): 1-28.
<b>Ifugao</b>	Asia	Southeast Asia	Intensive Agriculturalists	Indirect	Bait	Individual	Birds	Lure* Luring	Lambrech, Francis. 1957. "Mayawyaw Ritual: Vii. Hunting And Its Ritual." <i>Journal Of East Asiatic Studies</i> 6 (1). Manila: 1-28.
<b>Igbo</b>	Africa	Western Africa	Horticulturalists	Direct	Acoustic	Individual	Mammals	Imitat*	Basden, George Thomas, and John Ralph Willis. 1966. "Niger Ibos: A Description Of The Primitive Life, Customs And Animistic Beliefs, Etc., Of The Ibo People Of Nigeria." London: Cass.
<b>Igbo</b>	Africa	Western Africa	Horticulturalists	Direct	Acoustic	Individual	Birds	Imitat*	Basden, George Thomas. 1966. "Among The Ibos Of Nigeria: An Account Of The Curious And Interesting Habits, Customs And Beliefs Of A Little Known African People By One Who Has For Many Years Lived Amongst Them On Close And Intimate Terms." London: Cass.
<b>Imperial Romans</b>	Europe	Southern Europe	Intensive Agriculturalists	Indirect	Acoustic	Individual	Birds	Decoy*	Columella, Lucius Junius Moderatus, E. S. (Edward Seymour) Forster, and Edward Hoch Heffner. 1968. "On Agriculture: In Three Volumes : Ii. Res Rustica V-Ix." <i>Latin Authors</i> . Cambridge: Harvard University Press ; William Heinemann.
<b>Ingalik</b>	North America	Arctic and Subarctic	Hunter-gatherers	?	Visual	?	Caribou	Decoy*	Osgood, Cornelius. 1970. "Ingalik Material Culture." <i>Yale University Publications In</i>

									<i>Anthropology</i> . New Haven: Human Relations Area Files Press.
<b>Innu</b>	North America	Arctic and Subarctic	Hunter-gatherers	Direct	Acoustic	Group	Mammals	Decoy*	Tanner, V. 1944. "Outlines Of The Geography, Life And Customs Of Newfoundland-Labrador." <i>Acta Geographica</i> . Helsinki: Societas Geographica Fennia.
<b>Innu</b>	North America	Arctic and Subarctic	Hunter-gatherers	Direct	Acoustic	Individual	Birds	Lure* Luring	Tanner, V. 1944. "Outlines Of The Geography, Life And Customs Of Newfoundland-Labrador." <i>Acta Geographica</i> . Helsinki: Societas Geographica Fennia.
<b>Innu</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Visual	Group	Deer	Decoy*	Tanner, V. 1944. "Outlines Of The Geography, Life And Customs Of Newfoundland-Labrador." <i>Acta Geographica</i> . Helsinki: Societas Geographica Fennia.
<b>Innu</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Visual	Individual	Fish	Lure* Luring	Speck, Frank G. (Frank Gouldsmith). 1935. "Naskapi, The Savage Hunters Of The Labrador Peninsula." <i>Civilization Of The American Indian</i> . Norman: University of Oklahoma Press.
<b>Iroquois</b>	North America	Eastern Woodlands	Horticulturalists	Indirect	Bait	Individual	Birds	Lure* Luring	Fenton, William N. 1953. "Iroquois Eagle Dance An Offshoot Of The Calument Dance." <i>Bulletin</i> . Washington, D.C.: Smithsonian Institution.
<b>Island Carib</b>	Middle America and Caribbean	Caribbean	Primarily Hunter-Gatherers	Direct	Acoustic	?	Birds	Decoy*	Taylor, Douglas MacRae. 1938. "Caribs Of Dominica." <i>Bulletin ; Anthropological Papers</i> , 103-59.
<b>Island Carib</b>	Middle America and Caribbean	Caribbean	Hunter-gatherers	Indirect	Bait	Individual	Birds	Lure* Luring	Hodge, Walter H., and Douglas MacRae Taylor. 1957. "Ethnobotany Of The Island Caribs Of Dominica." <i>Webbia</i> 12. Firenze: 513-644.
<b>Jivaro</b>	South America	Amazon and Orinoco	Horticulturalists	Direct	Acoustic	Individual	Mammals	Decoy*	Karsten, Rafael. 1935. "Head-Hunters Of Western Amazonas: The Life And Culture Of The Jibaro Indians Of Eastern Ecuador And Peru." <i>Commentationes Humanarum Litterarum</i> . Helsingfors: Centraltryckeriet..
<b>Jivaro</b>	South America	Amazon and Orinoco	Horticulturalists	Direct	Acoustic	Individual	Birds	Imitat*	Karsten, Rafael. 1935. "Head-Hunters Of Western Amazonas: The Life And Culture Of The Jibaro Indians Of Eastern Ecuador And Peru." <i>Commentationes Humanarum Litterarum</i> . Helsingfors: Centraltryckeriet.
<b>Jivaro</b>	South America	Amazon and Orinoco	Horticulturalists	Direct	Acoustic	Individual	Monkey	Mimic*	Dyott, George Miller. 1926. "On The Trail Of The Unknown In The Wilds Of Ecuador And The Amazon." London: T. Butterworth, Ltd.
<b>Kapauku</b>	Oceania	Melanesia	Intensive Agriculturalists	Direct	Acoustic	Individual	Pigs	Lure* Luring	Pospisil, Leopold J. 1963. "Kapauku Papuan Economy." <i>Yale University Publications In Anthropology</i> . New Haven, Conn.: Dept. of Anthropology, Yale University.
<b>Kapauku</b>	Oceania	Melanesia	Intensive Agriculturalists	Indirect	Bait	Individual	Pigs	Lure* Luring	Pospisil, Leopold J. 1978. "Kapauku Papuans Of West New Guinea." <i>Case Studies In Cultural Anthropology</i> . New York: Holt, Rinehart, and Winston.
<b>Kapauku</b>	Oceania	Melanesia	Intensive Agriculturalists	Direct	Fire Fishing	Group	Fish	Lure* Luring	Pospisil, Leopold J. 1958. "Kapauku Papuans And Their Law." <i>Yale University Publications In Anthropology</i> . New Haven, Conn.: Published for the Dept. Anthropology, Yale University
<b>Karaja</b>	South America	Eastern South America	Hunter-gatherers	Direct	Acoustic	?	Birds and Game	Lure* Luring	Krause, -, Fritz, and Frieda Schütze. 1911. "In The Wilderness Of Brazil: Report And Results Of The Leipzig Araguaia Expedition Of 1908." Leipzig: R. Voigtländers Verlag.

<b>Karaja</b>	South America	Eastern South America	Hunter-gatherers	Direct	Visual	?	Otters	Lure* Luring	Krause, -, Fritz, and Frieda Schütze. 1911. "In The Wilderness Of Brazil: Report And Results Of The Leipzig Araguaia Expedition Of 1908." Leipzig: R. Voigtländers Verlag
<b>Karen</b>	Asia	Southeast Asia	Other Subsistence Combinations	Indirect	Acoustic	Individual	Birds	Decoy*	Marshall, Harry Ignatius. 1922. "Karen People Of Burma: A Study In Anthropology And Ethnology." <i>Ohio State University Bulletin</i> . Columbus: The University of Ohio Press.
<b>Karen</b>	Asia	Southeast Asia	Other Subsistence Combinations	Indirect	Acoustic	?	Mammals	Mimic*	Ferrars, Max, and Bertha Ferrars. 1900. "Karéns." London: Sampson Low, Marston and Company.
<b>Karen</b>	Asia	Southeast Asia	Other Subsistence Combinations	Direct	Acoustic	Individual	Barking Deer	Imitat*	Marshall, Harry Ignatius. 1922. "Karen People Of Burma: A Study In Anthropology And Ethnology." <i>Ohio State University Bulletin</i> . Columbus: The University of Ohio Press.
<b>Karen</b>	Asia	Southeast Asia	Other Subsistence Combinations	Direct	Acoustic	Individual	Birds	Imitat*	Marshall, Harry Ignatius. 1922. "Karen People Of Burma: A Study In Anthropology And Ethnology." <i>Ohio State University Bulletin</i> . Columbus: The University of Ohio Press.
<b>Kaska</b>	North America	Arctic and Subarctic	Hunter-gatherers	Direct	Acoustic	Individual	Moose	Imitat*	Honigmann, John Joseph, and Wendell Clark Bennett. 1949. "Culture And Ethos Of Kaska Society." <i>Yale University Publications In Anthropology</i> . New Haven, Conn.: Yale University Press.
<b>Kaska</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Olfactory	Individual	Predators	Lure* Luring	Honigmann, John Joseph, and Wendell Clark Bennett. 1949. "Culture And Ethos Of Kaska Society." <i>Yale University Publications In Anthropology</i> . New Haven, Conn.: Yale University Press.
<b>Kaska</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Visual	Individual	Caribou	Decoy*	Honigmann, John Joseph. 1954. "Kaska Indians: An Ethnographic Reconstruction." <i>Yale University Publications In Anthropology</i> . New Haven, Conn.: Yale University Press.
<b>Kaska</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Visual	?	Birds	Decoy*	Honigmann, John Joseph, and June Helm. 1983. "Kaska." <i>Handbook Of North American Indians. Subarctic</i> . Washington, D.C.: Smithsonian Institution : For sale by the Supt. of Docs., U.S. G.P.O.
<b>Khasi</b>	Asia	South Asia	Other Subsistence Combinations	Indirect	Bait	Individual	Birds	Lure* Luring	Gurdon, Philip Richard Thornhagh. 1907. "Khasis." London: David Nutt.
<b>Khoi</b>	Africa	Southern Africa	Other Subsistence Combinations	N/A	Acoustic	N/A	N/A	Imitat*	Schultze, Leonhard Sigmund, Elizabeth C. Knight, and Theodore Ziolkowski. 1907. "In Namaland And The Kalahari." Jena: Gustav Fischer.
<b>Kimam</b>	Oceania	Melanesia	Intensive Agriculturalists	Direct	Vibration	Individual	Kangaroos	Imitat*	Serpenti, L. M. 1965. "Cultivators In The Swamp: Social Structure And Horticulture In A New Guinea Society (Frederik-Hendrik Island, West New Guinea)." <i>Samenlevingen Buiten Europa. Non-European Societies</i> . Assen: Van Gorcum.
<b>Kiribati</b>	Oceania	Micronesia	Primarily Hunter-Gatherers	Indirect	Fishing	Individual	Fish	Lure* Luring	Koch, Gerd. 1986. "Material Culture Of Kiribati." [Suva, Fiji]: Institute of Pacific Studies of the University of the South Pacific.
<b>Kiribati</b>	Oceania	Micronesia	Primarily Hunter-Gatherers	Indirect	Visual	Individual	Fish	Lure* Luring	Koch, Gerd. 1986. "Material Culture Of Kiribati." [Suva, Fiji]: Institute of Pacific Studies of the University of the South Pacific.
<b>Klamath</b>	North America	Plains and Plateau	Hunter-gatherers	Direct	Acoustic	Individual/Group	Deer	Lure* Luring	Stern, Theodore. 1965. "Klamath Tribe: A People And Their Reservation." <i>American Ethnological Society</i> . Seattle: University of Washington Press.

<b>Klamath</b>	North America	Plains and Plateau	Hunter-gatherers	Direct	Visual	Individual/Group	Deer	Lure* Luring	Stern, Theodore. 1965. "Klamath Tribe: A People And Their Reservation." <i>American Ethnological Society</i> . Seattle: University of Washington Press.
<b>Klamath</b>	North America	Plains and Plateau	Hunter-gatherers	Direct	Visual	Individual	Birds/Fish	Lure* Luring	Stern, Theodore. 1965. "Klamath Tribe: A People And Their Reservation." <i>American Ethnological Society</i> . Seattle: University of Washington Press.
<b>Korea</b>	Asia	East Asia	Intensive Agriculturalists	Direct	Acoustic	Individual	Birds	Imitat*	Dallet, Charles, and Charles A. Messner. 1874. "History Of The Church In Korea: Vol. 1." Paris: Victor Palmé.
<b>Kuna</b>	Middle America and Caribbean	Central America	Horticulturalists	Indirect	Acoustic	Individual	Mammals	Lure* Luring	Nordenskiöld, Erland, Ruben érez Kantule, and Henry Wassén. 1938. "Historical And Ethnological Survey Of The Cuna Indians." <i>Comparative Ethnographical Studies</i> . Göteborg, Sweden: Göteborg Museum.
<b>Kuna</b>	Middle America and Caribbean	Central America	Horticulturalists	Direct	Acoustic	Individual	Curassow	Imitat*	Wafer, Lionel. 1934. "New Voyage And Description Of The Isthmus Of America." <i>Hakluyt Society</i> . Oxford: Printed for the Hakluyt Society.
<b>Kuna</b>	Middle America and Caribbean	Central America	Horticulturalists	Indirect	Visual	Group	Turtles	Decoy*	Chapin, Mac. 1997. "Curing Among The San Blas Kuna Of Panama." Ann Arbor, Michigan: University Microfilms International.
<b>Kutenai</b>	North America	Plains and Plateau	Hunter-gatherers	Direct	Fishing	Individual	Fish	Lure* Luring	urney-High, Harry Holbert. 1941. "Ethnography Of The Kutenai." <i>Memoirs Of The American Anthropological Association</i> . Menasha, Wis.: American Anthropological Association.
<b>Kutenai</b>	North America	Plains and Plateau	Hunter-gatherers	Indirect	Olfactory	Individual	Beavers	Lure* Luring	Schaeffer, Claude E. 1966. "Bear Ceremonialism Of The Kutenai Indians." <i>Studies In Plains Anthropology And History</i> . Washington: U.S. Dept. of the Interior, Indian Arts and Crafts Board.
<b>Kutenai</b>	North America	Plains and Plateau	Hunter-gatherers	Indirect	Visual	?	Waterfowl	Decoy*	Turney-High, Harry Holbert. 1941. "Ethnography Of The Kutenai." <i>Memoirs Of The American Anthropological Association</i> . Menasha, Wis.: American Anthropological Association.
<b>Lau Fijians</b>	Oceania	Polynesia	Other Subsistence Combinations	Indirect	Acoustic	?	Fish	Lure* Luring	Thompson, Laura. 1940. "Southern Lau, Fiji: An Ethnography." <i>Bulletin</i> . Honolulu, Hawaii: Bernice P. Bishop Museum.
<b>Lau Fijians</b>	Oceania	Polynesia	Other Subsistence Combinations	Indirect	Visual	?	Fish	Lure* Luring	Thompson, Laura. 1940. "Southern Lau, Fiji: An Ethnography." <i>Bulletin</i> . Honolulu, Hawaii: Bernice P. Bishop Museum.
<b>Lepcha</b>	Asia	Central Asia	Intensive Agriculturalists	Direct	Acoustic	Individual	Mammals	Imitat*	Siiger, Halfdan. 1967. "Lepchas: Culture And Religion Of A Himalayan People, Part 1." <i>Nationalmuseets Skrifter. Etnografisk Række [Publications Of The National Museum Of Denmark, Ethnographical Series]</i> . Copenhagen: The National Museum of Denmark.
<b>Lepcha</b>	Asia	Central Asia	Intensive Agriculturalists	Direct	Acoustic	Individual	Birds	Lure* Luring	Gorer, Geoffrey, and J. H. Hutton. 1938. "Himalayan Village: An Account Of The Lepchas Of Sikkim." London: Michael Joseph, Ltd.
<b>Malays</b>	Asia	Southeast Asia	Intensive Agriculturalists	Fishing	Fishing	Group	Fish	Lure* Luring	Firth, Raymond, 1901-2002. <i>Malay fishermen: their peasant economy</i>
<b>Manchu</b>	Asia	East Asia	Intensive Agriculturalists	Direct	Mixed	Group	Deer	Lure* Luring	Elliott, Mark C. 2001. "Manchu Way: The Eight Banners And Ethnic Identity In Late Imperial China." Stanford, Ca: Stanford University Press.
<b>Maori</b>	Oceania	Polynesia	Primarily Hunter-Gatherers	Indirect	?	Individual	Birds	Lure* Luring	Best, Elsdon. 1924. "Maori: Volume 2." <i>Memoirs Of The Polynesian Society</i> . Wellington, N.Z.: Printed by H.H. Tombs, limited.



<b>Maori</b>	Oceania	Polynesia	Primarily Hunter-Gatherers	Indirect	Acoustic	Individual	Parrots	Decoy*	Best, Elsdon. 1924. "Maori: Volume 2." <i>Memoirs Of The Polynesian Society</i> . Wellington, N.Z.: Printed by H.H. Tombs, limited.
<b>Maori</b>	Oceania	Polynesia	Primarily Hunter-Gatherers	Direct	Acoustic	Individual	Birds	Lure* Luring	Best, Elsdon. 1924. "Maori: Volume 2." <i>Memoirs Of The Polynesian Society</i> . Wellington, N.Z.: Printed by H.H. Tombs, limited.;Firth, Raymond. 1959. "Economics Of The New Zealand Maori." Wellington, Nz.: R. E. Owen, Govt.Printer.
<b>Maori</b>	Oceania	Polynesia	Primarily Hunter-Gatherers	Indirect	Bait	Individual	Birds	Lure* Luring	Best, Elsdon. 1924. "Maori: Volume 2." <i>Memoirs Of The Polynesian Society</i> . Wellington, N.Z.: Printed by H.H. Tombs, limited.
<b>Maori</b>	Oceania	Polynesia	Primarily Hunter-Gatherers	Indirect	Visual	Individual	Birds	Decoy*	Buck, Peter Henry. 1952. "Coming Of The Maori." Wellington: Maori Purposes Fund Board; [distributed by] Whitcombe and Tombs.
<b>Maori</b>	Oceania	Polynesia	Primarily Hunter-Gatherers	Indirect	Visual	Individual	Fish	Lure* Luring	Best, Elsdon. 1924. "Maori: Volume 2." <i>Memoirs Of The Polynesian Society</i> . Wellington, N.Z.: Printed by H.H. Tombs, limited.;Buck, Peter Henry. 1952. "Coming Of The Maori." Wellington: Maori Purposes Fund Board; [distributed by] Whitcombe and Tombs.
<b>Maori</b>	Oceania	Polynesia	Primarily Hunter-Gatherers	Indirect	Visual	Individual	Birds	Lure* Luring	Best, Elsdon. 1924. "Maori: Volume 2." <i>Memoirs Of The Polynesian Society</i> . Wellington, N.Z.: Printed by H.H. Tombs, limited.
<b>Maricopa</b>	North America	Southwest and Basin	Primarily Hunter-Gatherers	Direct	Visual	Individual	Deer	Imitat*	Spier, Leslie. 1933. "Yuman Tribes Of The Gila River." <i>University Of Chicago Publications In Anthropology ; Ethnological Series</i> . Chicago: University of Chicago Press.
<b>Marqueses</b>	Oceania	Polynesia	Other Subsistence Combinations	Direct	Fire Fishing	Group	Fish	Lure* Luring	Handy, E. S. Craighill (Edward Smith Craighill). 1923. "Native Culture In The Marquesas." <i>Bulletin. Honolulu: The Museum</i>
<b>Marqueses</b>	Oceania	Polynesia	Other Subsistence Combinations	Direct	Fishing	Group	Fish	Lure* Luring	Handy, E. S. Craighill (Edward Smith Craighill). 1923. "Native Culture In The Marquesas." <i>Bulletin. Honolulu: The Museum/ Linton, Ralph</i> . 1923. "Material Culture Of The Marquesas Islands." <i>Memoirs Of The Bernice Pauahi Bishop Museum, ; ; Bayard Dominick Expedition. Publication ; Publication (Bayard Dominick Expedition (1920-1921)) ; . v 8 (5). Honolulu: 263-468.</i>
<b>Marshallese</b>	Oceania	Micronesia	Other Subsistence Combinations	Indirect	Bait	Individual	Rats	Lure* Luring	Krämer, Augustin, - Nevermann Hans, Charles Brant, and John M. Armstrong. 1938. "Ralik-Ratak (Marshall Islands)." <i>Ergebnisse Der Südsee-Expedition 1908-1910, li ; Ethnographie: B. Mikronesien</i> . Hamburg: Friederichsen, De Gruyter and Co.
<b>Marshallese</b>	Oceania	Micronesia	Other Subsistence Combinations	Direct	Fire Fishing	Individual	Fish	Lure* Luring	Krämer, Augustin, - Nevermann Hans, Charles Brant, and John M. Armstrong. 1938. "Ralik-Ratak (Marshall Islands)." <i>Ergebnisse Der Südsee-Expedition 1908-1910, li ; Ethnographie: B. Mikronesien</i> . Hamburg: Friederichsen, De Gruyter and Co.
<b>Marshallese</b>	Oceania	Micronesia	Other Subsistence Combinations	Indirect	Visual	Individual	Fish	Imitat*	Erdland, August, and Richard Neuse. 1914. "Marshall Islanders: Life And Customs, Thought And Religion Of A South Seas People." <i>Anthropos Bibliothek Ethnological Monographs</i> . Münster I. W.
<b>Mataco</b>	South America	Southern South America	Hunter-gatherers	Direct	Acoustic	Individual	Parrots	Imitat*	Alvarsson, Jan-åke. 1988. "Mataco Of The Gran Chaco: An Ethnographic Account Of Change And Continuity In Mataco Socio-Economic

									Organization." <i>Acta Universitatis Upsaliensis, Uppsala Studies In Cultural Anthropology</i> . Uppsala, Sweden: Academiae Upsaliensis ; Distributed by Almqvist &Wiskell International.
<b>Mataco</b>	South America	Southern South America	Hunter-gatherers	Indirect	Bait	Group	Deer	Lure* Luring	Alvarsson, Jan-åke. 1988. "Mataco Of The Gran Chaco: An Ethnographic Account Of Change And Continuity In Mataco Socio-Economic Organization." <i>Acta Universitatis Upsaliensis, Uppsala Studies In Cultural Anthropology</i> . Uppsala, Sweden: Academiae Upsaliensis ; Distributed by Almqvist &Wiskell International.
<b>Mataco</b>	South America	Southern South America	Hunter-gatherers	Indirect	Bait	Individual	Birds	Lure* Luring	Alvarsson, Jan-åke. 1988. "Mataco Of The Gran Chaco: An Ethnographic Account Of Change And Continuity In Mataco Socio-Economic Organization." <i>Acta Universitatis Upsaliensis, Uppsala Studies In Cultural Anthropology</i> . Uppsala, Sweden: Academiae Upsaliensis ; Distributed by Almqvist &Wiskell International.
<b>Maya</b>	Middle America and Caribbean	Maya Area	Horticulturalists	Direct	Acoustic	Individual	Deer	Imitat*	Redfield, Robert, and Alfonso Villa Rojas. 1962. "Chan Kom: A Maya Village." Chicago: University of Chicago Press.
<b>Maya</b>	Middle America and Caribbean	Maya Area	Horticulturalists	Direct	Acoustic	Individual	Birds	Imitat*	Villa Rojas, Alfonso. 1945. "Maya Of East Central Quintana Roo." <i>Publication</i> . Washington, D.C.: Carnegie Institution of Washington.
<b>Mbuti</b>	Africa	Central Africa	Hunter-gatherers	Direct	Acoustic	Group	Large Mammal	Lure* Luring	Turnbull, Colin M. 1962. "Forest People." New York, N.Y.: Simon and Schuster.
<b>Mbuti</b>	Africa	Central Africa	Hunter-gatherers	Direct	Acoustic	Individual	?	Imitat*	Turnbull, Colin M. 1965. "Mbuti Pygmies: An Ethnographic Survey." <i>Anthropological Papers</i> . New York: American Museum of Natural History.
<b>Mbuti</b>	Africa	Central Africa	Hunter-gatherers	N/A	N/A	N/A	N/A	Deceive*	Turnbull, Colin M. 1965. "Wayward Servants: The Two Worlds Of The African Pygmies." Garden City, N.Y.: The Natural History Press.
<b>Mende</b>	Africa	Western Africa	Horticulturalists	Direct	Acoustic	Individual	Duiker	Decoy*	Leach, Melissa. 1994. "Rainforest Relations: Gender And Resource Use Among The Mende Of Gola, Sierra Leone." <i>International African Library</i> . Edinburgh: Edinburgh University Press for the International African Institute, London.
<b>Mi'kmaq</b>	North America	Eastern Woodlands	Hunter-gatherers	Direct	Acoustic	Individual	Moose	Lure* Luring	Wallis, Wilson D. (Wilson Dallam), and Ruth Sawtell Wallis. 1955. "Micmac Indians Of Eastern Canada." Minneapolis: University of Minnesota Press.
<b>Mi'kmaq</b>	North America	Eastern Woodlands	Hunter-gatherers	Direct	Fire Fishing	Individual	Fish	Lure* Luring	Prins, Harald E. L. 1996. "Mi'Kmaq: Resistance, Accomodation, And Cultural Survival." <i>Case Studies In Cultural Anthropology</i> . Fort Worth: Harcourt Brace College Pub.
<b>Mi'kmaq</b>	North America	Eastern Woodlands	Hunter-gatherers	Indirect	Mixed	Individual	Waterfowl	Decoy*	Wallis, Wilson D. (Wilson Dallam), and Ruth Sawtell Wallis. 1955. "Micmac Indians Of Eastern Canada." Minneapolis: University of Minnesota Press.
<b>Mi'kmaq</b>	North America	Eastern Woodlands	Hunter-Gatherers	Direct	Visual	Individual	Seals	Deception	Wallis, Wilson D. (Wilson Dallam), and Ruth Sawtell Wallis. 1955. "Micmac Indians Of Eastern Canada." Minneapolis: University of Minnesota Press.
<b>Mi'kmaq</b>	North America	Eastern Woodlands	Hunter-gatherers	Direct	Visual	Individual	Sea mammals	Decoy*	Bock, Phillip K. 1978. "Micmac." <i>Handbook Of North American Indians, Northeast</i> . Washington, D.C.: Smithsonian Institution.

<b>Mi'kmaq</b>	North America	Eastern Woodlands	Hunter-gatherers	Indirect	Visual	Individual	Seals	Lure* Luring	Wallis, Wilson D. (Wilson Dallam), and Ruth Sawtell Wallis. 1955. "Micmac Indians Of Eastern Canada." Minneapolis: University of Minnesota Press.
<b>Miskito</b>	Middle America and Caribbean	Central America	Primarily Hunter-Gatherers	Direct	Acoustic	Individual	Birds	Imitat*	Conzemius, Eduard. 1932. "Ethnographical Survey Of The Miskito And Sumu Indians Of Honduras And Nicaragua." <i>Bureau Of American Ethnology</i> . Washington: U.S. Govt. print. off.
<b>Miskito</b>	Middle America and Caribbean	Central America	Primarily Hunter-Gatherers	Direct	Acoustic	Individual	Agouti	Lure* Luring	Conzemius, Eduard. 1932. "Ethnographical Survey Of The Miskito And Sumu Indians Of Honduras And Nicaragua." <i>Bureau Of American Ethnology</i> . Washington: U.S. Govt. print. off.
<b>Miskito</b>	Middle America and Caribbean	Central America	Primarily Hunter-Gatherers	Indirect	Visual	?	Turtles	Decoy*	Conzemius, Eduard. 1932. "Ethnographical Survey Of The Miskito And Sumu Indians Of Honduras And Nicaragua." <i>Bureau Of American Ethnology</i> . Washington: U.S. Govt. print. off.
<b>Mongo</b>	Africa	Central Africa	Horticulturalists	Direct	Acoustic	Individual	Monkey	Decoy*	Sato, Hiroaki. 1983. "Hunting Of The Boyela, Slash-And-Bum Agriculturalists, In The Central Zaire Forest." <i>African Study Monographs</i> 4: 1-54.
<b>Mongo</b>	Africa	Central Africa	Horticulturalists	Direct	Acoustic	Individual	Duiker, predators	Decoy*	Sato, Hiroaki. 1983. "Hunting Of The Boyela, Slash-And-Bum Agriculturalists, In The Central Zaire Forest." <i>African Study Monographs</i> 4: 1-54.
<b>Mongolia</b>	Asia	Central Asia	Pastoralists	Fishing	Fire Fishing	Group	Fish	Lure* Luring	Vreeland, Herbert Harold. 1973. "Mongol Community And Kinship Structure." Westport, Conn.: Greenwood Press.
<b>Mundurucu</b>	South America	Amazon and Orinoco	Hunter-gatherers	Indirect	Mixed	Group	Tapir	Lure* Luring	Burkhalter, Steve Brian. 2001. "Amazon Gold Rush: Markets And The Mundurucu Indians." Ann Arbor, Mich.: University Microfilms International.
<b>Navajo</b>	North America	Southwest and Basin	Agro-Pastoralists	Direct	Acoustic	Group	Deer	Imitat*	Kluckhohn, Clyde, W. W. (Willard Williams) Hill, and Lucy Wales Kluckhohn. 1971. "Navaho Material Culture." Cambridge, Mass.: Belknap Press of Harvard University Press.
<b>Navajo</b>	North America	Southwest and Basin	Agro-Pastoralists	Indirect	Bait	Group	Eagles	Decoy*	Hill, W. W. (Willard Williams). 1938. "Agricultural And Hunting Methods Of The Navaho Indians." New Haven: Published for the Department of Anthropology, Yale University, by the Yale University Press ; H. Milford, Oxford University Press.
<b>Navajo</b>	North America	Southwest and Basin	Agro-Pastoralists	Direct	Olfactory	Group	Deer	Imitat*	Hill, W. W. (Willard Williams). 1938. "Agricultural And Hunting Methods Of The Navaho Indians." New Haven: Published for the Department of Anthropology, Yale University, by the Yale University Press ; H. Milford, Oxford University Press.
<b>Navajo</b>	North America	Southwest and Basin	Agro-Pastoralists	Indirect	Visual	Group	Birds/Eagles	Decoy*	Hill, W. W. (Willard Williams). 1938. "Agricultural And Hunting Methods Of The Navaho Indians." New Haven: Published for the Department of Anthropology, Yale University, by the Yale University Press ; H. Milford, Oxford University Press.
<b>Navajo</b>	North America	Southwest and Basin	Agro-Pastoralists	Direct	Visual	Group	Deer	Imitat*	Hill, W. W. (Willard Williams). 1938. "Agricultural And Hunting Methods Of The Navaho Indians." New Haven: Published for the Department of Anthropology, Yale University, by the Yale University Press ; H. Milford, Oxford University Press.

<b>Navajo</b>	North America	Southwest and Basin	Agro-Pastoralists	Indirect	Visual	Individual	Prairie dogs	Lure* Luring	Downs, James F. 1964. "Animal Husbandry In Navajo Society And Culture." <i>University Of California Publications In Anthropology</i> . Berkeley: University of California Press.; Downs, James F. 1972. "Navajo." Case Studies In Cultural Anthropology. New York: Holt, Rinehart and Winston.
<b>Nenets</b>	Asia	North Asia	Primarily Hunter-Gatherers	Indirect	Bait	?	Reindeer	Decoy*	Prokof'eva, E. D., M. G. (Maksim Grigor'evich) Levin, and L. P. (Leonid Pavlovich) Potapov. 1964. "Nentsy." <i>Peoples Of Siberia</i> . Chicago: University of Chicago Press.
<b>Nenets</b>	Asia	North Asia	Primarily Hunter-Gatherers	Indirect	Bait	?	Flies	Decoy*	Prokof'eva, E. D., M. G. (Maksim Grigor'evich) Levin, and L. P. (Leonid Pavlovich) Potapov. 1964. "Nentsy." <i>Peoples Of Siberia</i> . Chicago: University of Chicago Press.
<b>Nicobarese</b>	Asia	South Asia	Other Subsistence Combinations	Direct	Fire Fishing	Individual	Fish	Lure* Luring	Whitehead, George. 1924. "In The Nicobar Islands: The Record Of A Lengthy Sojourn In Islands Of Sunshine & Palms Amongst A People Primitive In Their Habits & Beliefs & Simple In Their Manner Of Living, With A Description Of Their Customs & Religious Ceremonies & An Account Of Their Superstitions, Traditions, & Folklore." London: Seeley, Service & Co. Limited.
<b>Nivkh</b>	Asia	North Asia	Primarily Hunter-Gatherers	Direct	Visual	Individual	Wolves	Imitat*	Shrenk, Leopold Ivanovich, and Alois Nagler. 1881-1895. "Peoples Of The Amur Region." <i>Reisen Und Forschungen Im Amur-Lande In Den Jahren 1854-1856</i> . St. Petersburg: Kaiserliche Akademie der Wissenschaften.
<b>Northern Paiute</b>	North America	Southwest and Basin	Hunter-gatherers	Indirect	Bait	Individual	Fish	Decoy*	Fowler, Catherine S., and Joyce E. Bath. 1981. "Pyramid Lake Northern Paiute Fishing: The Ethnographic Record." <i>Journal Of California And Great Basin Anthropology</i> 3 (2): 176-86.
<b>Northern Paiute</b>	North America	Southwest and Basin	Hunter-Gatherers	Direct	Visual	Group	Antelope	Deception	Kelly, Isabel Truesdell. 1934. "Ethnography Of The Surprise Valley Paiute." <i>University Of California Publications. American Archaeology And Ethnology</i> . Berkeley, Calif.: University of California Press.
<b>Northern Paiute</b>	North America	Southwest and Basin	Hunter-gatherers	Indirect	Visual	Individual	Waterfowl	Decoy*	Fowler, Catherine S., and Sven S. (Sven Samuel) Liljebld. 1986. "Northern Paiute." <i>Handbook Of North American Indians. Great Basin</i> . Washington, D. C.: Smithsonian Institution : For sale by the Supt. of Docs., U.S.G.P.O.
<b>Northern Paiute</b>	North America	Southwest and Basin	Hunter-gatherers	Indirect	Visual	Individual	Birds	Decoy*	Kelly, Isabel Truesdell. 1934. "Ethnography Of The Surprise Valley Paiute." <i>University Of California Publications. American Archaeology And Ethnology</i> . Berkeley, Calif.: University of California Press.
<b>Nuer</b>	Africa	Eastern Africa	Agro-Pastoralists	Direct	Acoustic	Individual	Fish	Imitat*	Huffman, Ray, and D. Westermann. 1931. "Nuer Customs And Folklore." London: International Institute of African Language and Culture.
<b>Nuer</b>	Africa	Eastern Africa	Agro-Pastoralists	Indirect	Acoustic	Individual	Fish	Imitat*	Huffman, Ray, and D. Westermann. 1931. "Nuer Customs And Folklore." London: International Institute of African Language and Culture.
<b>Nuu-chah-nulth</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Visual	Individual	Fish	Decoy*	Sapir, Edward, and Morris Swadesh. 1955. "Native Accounts Of Nootka Ethnography." <i>International Journal Of American Linguistics ; Publication Of The Indiana University Research Center In</i>

									<i>Anthropology, Folklore, And Linguistics.</i> Bloomington, Indiana: Indiana University, Research Center in Anthropology, Folklore, and Linguistics.
<b>Nuxalk</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Bait	Individual	Carnivores	Lure* Luring	Mellwraith, T. F. (Thomas Forsyth). 1948. "Bella Coola Indians: Volume One." Toronto: University of Toronto Press.
<b>Nuxalk</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Fire Fishing	Individual	Fish	Lure* Luring	Mellwraith, T. F. (Thomas Forsyth). 1948. "Bella Coola Indians: Volume One." Toronto: University of Toronto Press.
<b>Ojibwa</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Bait	Individual	Birds	Decoy*	Vennum, Thomas. 1988. "Wild Rice And The Ojibway People." St. Paul: Minnesota Historical Society Press.
<b>Ojibwa</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Bait	Individual	Predators	Lure* Luring	Hilger, M. Inez (Mary Inez). 1951. "Chippewa Child Life And Its Cultural Background." <i>Bulletin</i> . Washington: U.S. Govt. Print. Off.
<b>Ojibwa</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Bait	Individual	Deer	Lure* Luring	Hilger, M. Inez (Mary Inez). 1951. "Chippewa Child Life And Its Cultural Background." <i>Bulletin</i> . Washington: U.S. Govt. Print. Off.
<b>Ojibwa</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Fishing	Individual	Fish	Decoy*	Densmore, Frances. 1929. "Chippewa Customs." <i>Bulletin</i> . Washington: U.S. Govt. print. off.
<b>Ojibwa</b>	North America	Arctic and Subarctic	Hunter-Gatherers	N/A	N/A	N/A	N/A	Deception	Jeness, Diamond. 1935. "Ojibwa Indians Of Parry Island, Their Social And Religious Life." <i>Bulletin</i> . Ottawa: National Museum of Canada, J. O. Patenaude, printer.
<b>Ojibwa</b>	North America	Arctic and Subarctic	Hunter-gatherers	Direct	Visual	Individual	Mammals	Deceive*	Tanner, John, and Edwin James. 1830. "Narrative Of The Captivity And Adventures Of John Tanner, (U.S. Interpreter At The Saut De Ste. Marie,): During Thirty Years Residence Among The Indians In The Interior Of North America." New York: G. & C. & H. Carvill.
<b>Ojibwa</b>	North America	Arctic and Subarctic	Hunter-gatherers	Direct	Visual	Group	Buffalo	Decoy*	Skinner, Alanson Buck. 1914. "Political And Ceremonial Organization Of The Plains-Ojibway." <i>Anthropological Papers Of The American Museum Of Natural History</i> . New York: The Trustees.
<b>Ojibwa</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Visual	Individual	Waterfowl	Decoy*	S., Rogers. Edward. 1962. "Round Lake Ojibwa." <i>Occasional Paper</i> . [Toronto]: Published by the Ontario Dept. of Lands and Forests for the Royal Ontario Museum.
<b>Ojibwa</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Visual	Individual	Fish	Decoy*	Densmore, Frances. 1929. "Chippewa Customs." <i>Bulletin</i> . Washington: U.S. Govt. print. off.
<b>Ojibwa</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Visual	Individual	Birds	Lure* Luring	S., Rogers. Edward. 1962. "Round Lake Ojibwa." <i>Occasional Paper</i> . [Toronto]: Published by the Ontario Dept. of Lands and Forests for the Royal Ontario Museum.
<b>Okinawans</b>	Asia	East Asia	Intensive Agriculturalists	Fishing	Visual	Individual	Cuttlefish	Lure* Luring	Glacken, Clarence J. 1953. "Studies Of Okinawan Village Life." <i>Scientific Investigations In The Ryuku Islands</i> . Washington D.C.: Pacific Science Board, National Research Council.
<b>Omaha</b>	North America	Plains and Plateau	Primarily Hunter-Gatherers	N/A	N/A	N/A	N/A	Decoy*	Fletcher, Alice C. (Alice Cunningham), and Francis La Flesche. 1911. "Omaha Tribe." <i>Twenty-Seventh Annual Report Of The Bureau Of American Ethnology, 1905-06</i> . Washington: Government Printing Office.
<b>Ona</b>	South America	Southern South America	Hunter-gatherers	Direct	Acoustic	Individual	Birds	Deceive*	Gusinde, Martin. 1931. "Fireland Indians: Vol. 1. The Selk'Nam, On The Life And Thought Of A Hunting People Of The Great Island Of Tierra Del

									Fuego." <i>Expeditions</i> . Mödling Bei Wien: Verlag der Internationalen Zeitschrift.
<b>Ona</b>	South America	Southern South America	Hunter-gatherers	Indirect	Mixed	Individual	Seals	Decoy*	Chapman, Anne. 1982. "Drama And Power In A Hunting Society: The Selk'Nam Of Tierra Del Fuego." Cambridge, [England]: Cambridge University Press.
<b>O'odham</b>	North America	Southwest and Basin	Other Subsistence Combinations	Direct	Mixed	Individual	Deer	Imitat*	Castetter, Edward Franklin, and Ruth Murray Underhill. 1935. "Ethnobiology Of The Papago Indians." <i>Ethnobiological Studies In The American Southwest</i> 4 (3): 84.
<b>Orokaiva</b>	Oceania	Melanesia	Other Subsistence Combinations	Direct	Fishing	Individual	Fish	Lure* Luring	Williams, F. E. (Francis Edgar), and Hubert Murray. 1930. "Orokaiva Society." London: Oxford University Press.
<b>Ovimbundu</b>	Africa	Southern Africa	Horticulturalists	Direct	Acoustic	Individual	Antelope	Decoy*	Hambly, Wilfrid Dyson. 1934. "Ovimbundu Of Angola: Frederick H. Rawson-Field Museum Ethnological Expedition To West Africa, 1929-30. ; 84 Plates In Photogravure And 1 Map." <i>Anthropological Series</i> . Chicago.
<b>Ovimbundu</b>	Africa	Southern Africa	Horticulturalists	Direct	Acoustic	?	Duiker	Lure* Luring	Ennis, Merlin W., and Albert Bates Lord. 1962. "Umbundu: Folk Tales From Angola." Boston: Beacon Press.
<b>Ovimbundu</b>	Africa	Southern Africa	Horticulturalists	Direct	Bait	?	Deer	Decoy*	Hambly, Wilfrid Dyson. 1934. "Ovimbundu Of Angola: Frederick H. Rawson-Field Museum Ethnological Expedition To West Africa, 1929-30. ; 84 Plates In Photogravure And 1 Map." <i>Anthropological Series</i> . Chicago.
<b>Ovimbundu</b>	Africa	Southern Africa	Horticulturalists	N/A	N/A	N/A	N/A	Mimic*	Hambly, Wilfrid Dyson. 1934. "Ovimbundu Of Angola: Frederick H. Rawson-Field Museum Ethnological Expedition To West Africa, 1929-30. ; 84 Plates In Photogravure And 1 Map." <i>Anthropological Series</i> . Chicago.
<b>Ovimbundu</b>	Africa	Southern Africa	Horticulturalists	Direct	Visual	Group	Antelope	Decoy*	Hambly, Wilfrid Dyson. 1934. "Ovimbundu Of Angola: Frederick H. Rawson-Field Museum Ethnological Expedition To West Africa, 1929-30. ; 84 Plates In Photogravure And 1 Map." <i>Anthropological Series</i> . Chicago.
<b>Pawnee</b>	North America	Plains and Plateau	Primarily Hunter-Gatherers	Direct	Visual	Group	Buffalo	Imitat*	Weltfish, Gene. 1965. "Lost Universe: With A Closing Chapter On 'The Universe Regained.'" New York: Basic Books.
<b>Pomo</b>	North America	Northwest Coast and California	Hunter-Gatherers	?	?	Individual	Squirrels	Deception	Kniffen, Fred Bowerman. 1939. "Pomo Geography." <i>Publications In American Archaeology And Ethnology</i> . Berkeley, Calif.: University of California Press.
<b>Pomo</b>	North America	Northwest Coast and California	Hunter-gatherers	Direct	Acoustic	Individual	Deer	Lure* Luring	Barrett, S. A. (Samuel Alfred). 1952. "Material Aspects Of Pomo Culture." <i>Bulletin Of The Public Museum Of The City Of Milwa</i> . Milwaukee, Wis.: Published by order of the Board of Trustees.;Theodoratus, Dorothea J. 1971. "Identity Crises: Changes In Lifestyle Of The Manchester Band Of The Pomo Indians." Ann Arbor, Michigan: University Microfilms.
<b>Pomo</b>	North America	Northwest Coast and California	Hunter-gatherers	Direct	Visual	Individual	Birds	Lure* Luring	Barrett, S. A. (Samuel Alfred). 1952. "Material Aspects Of Pomo Culture." <i>Bulletin Of The Public Museum Of The City Of Milwa</i> . Milwaukee, Wis.: Published by order of the Board of Trustees.

<b>Puerto Ricans</b>	Middle America and Caribbean	Caribbean	Commerical Economy	Direct	Visual	Individual	Fish	Lure* Luring	Griffith, David Craig, and Manuel Valdés Pizzini. 2002. "Fishers At Work, Workers At Sea: A Puerto Rican Journey Through Labor And Refuge." Philadelphia: Temple University Press.
<b>Pumé</b>	South America	Amazon and Orinoco	Other Subsistence Combinations	Direct	Visual	Individual	Jabiru Stork	Imitat*	Petrullo, Vincenzo. 1939. "Yaruros Of The Capanaparo River, Venezuela." <i>Bulletin</i> . Washington: U.S. Govt Print. Off.
<b>Pumé</b>	South America	Amazon and Orinoco	Other Subsistence Combinations	Direct	Visual	Individual	Deer	Mimic*	Petrullo, Vincenzo. 1939. "Yaruros Of The Capanaparo River, Venezuela." <i>Bulletin</i> . Washington: U.S. Govt Print. Off.
<b>Quinault</b>	North America	Northwest Coast and California	Hunter-gatherers	Direct	Acoustic	Individual	Deer	Lure* Luring	Ison, Ronald L. (Ronald Leroy). 1936. "Quinault Indians." <i>University Of Washington Publications In Anthropology</i> . Seattle, Wash.: The University of Washington.
<b>Quinault</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Visual	Individual	Birds	Decoy*	Olson, Ronald L. (Ronald Leroy). 1936. "Quinault Indians." <i>University Of Washington Publications In Anthropology</i> . Seattle, Wash.: The University of Washington.
<b>Quinault</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Visual	Individual	Fish	Lure* Luring	Ison, Ronald L. (Ronald Leroy). 1936. "Quinault Indians." <i>University Of Washington Publications In Anthropology</i> . Seattle, Wash.: The University of Washington.;Storm, Jacqueline M., and Pauline K. Capoeman. 1990. "Land Of The Quinault." Taholah, Wash.: Quinault Indian Nation.
<b>Rapa Nui</b>	Oceania	Polynesia	Horticulturalists	Indirect	Fishing	Individual	Fish	Lure* Luring	Métraux, Alfred. 1940. "Ethnology Of Easter Island." <i>Bulletin</i> . Honolulu, Hawaii: The Museum.
<b>Rural Irish</b>	Europe	British Isles	Agro-Pastoralists	Direct	Visual	Individual	Fish	Lure* Luring	Evans, E. Estyn (Emyr Estyn). 1957. "Irish Folk Ways." London: Routledge and Paul.
<b>Rwandans</b>	Africa	Central Africa	Agro-Pastoralists	Direct	Bait	Group	Elephants	Decoy*	Czekanowski, Jan. 1917. "Investigations In The Area Between The Nile And The Congo: First Volume: Ethnography, The Interlacustrine Region Of Mporo And Ruanda." <i>Wissenschaftliche Ergebnisse Der Deutschen Zentral-Afrika-Expedition 1907-1908 Unter Führung Adolf Friedrichs, Herzogs Zu Mechlenburg [Scientific Results Of The German Central African Expedition 1907-1908 Under The Leadership Of Adolf Friedrichs, Duke Of Mechlenburg]</i> . Leipzig: Klinkhardt & Biermann.
<b>Saami</b>	Europe	Scandinavia	Pastoralists	Direct	Acoustic	Individual	Birds	Imitat*	Itkonen, Toivo Immanuel, Olga Guemati, and Elisabeth Perez-Roman. 1948. "Lapps In Finland Up To 1945. Vol. 2." Porvoo, Helsinki: Werner Söderström Osakeyhtiö.
<b>Saami</b>	Europe	Scandinavia	Pastoralists	Indirect	Bait	?	Reindeer	Decoy*	Anderson, Myrdene. 1978. "Saami Ethnoecology: Resource Management In Norwegian Lapland." Ann Arbor, Mich.: University Microfilms International.
<b>Saami</b>	Europe	Scandinavia	Pastoralists	Indirect	Bait	Individual	Carnivores	Lure* Luring	studies, Indiana University. Graduate Program in Uralic, Asian, and Eeva K. Minn. 1955. "Lapps." <i>Subcontractor 'S Monograph</i> . New Haven, Conn.: HRAF.
<b>Saami</b>	Europe	Scandinavia	Pastoralists	Fishing	Fishing	Group	Fish	Lure* Luring	Dikkanen, Siri Lavik. 1965. "Sirma: Residence And Work Organization In A Lappish-Speaking Community." <i>Samiske Samlinger</i> . Oslo, Norway: Norsk Folkemuseum.
<b>Saami</b>	Europe	Scandinavia	Pastoralists	Indirect	Mixed	Group	Reindeer	Lure* Luring	Anderson, Myrdene. 1978. "Saami Ethnoecology: Resource Management In Norwegian Lapland."

									Ann Arbor, Mich.: University Microfilms International.
<b>Saami</b>	Europe	Scandinavia	Pastoralists	Direct	Visual	?	Birds	Decoy*	Itkonen, Toivo Immanuel, Olga Guemati, and Elisabeth Perez-Roman. 1948. "Lapps In Finland Up To 1945. Vol. 2." Porvoo, Helsinki: Werner Söderström Osakeyhtiö.
<b>Saami</b>	Europe	Scandinavia	Pastoralists	Indirect	Visual	?	Birds	Decoy*	Itkonen, Toivo Immanuel, Olga Guemati, and Elisabeth Perez-Roman. 1948. "Lapps In Finland Up To 1945. Vol. 2." Porvoo, Helsinki: Werner Söderström Osakeyhtiö.
<b>Saami</b>	Europe	Scandinavia	Pastoralists	Direct	Visual	Group	Geese	Lure* Luring	Itkonen, Toivo Immanuel, Olga Guemati, and Elisabeth Perez-Roman. 1948. "Lapps In Finland Up To 1945. Vol. 2." Porvoo, Helsinki: Werner Söderström Osakeyhtiö.
<b>Saami</b>	Europe	Scandinavia	Pastoralists	Indirect	Visual	Individual	Beavers	Lure* Luring	Vorren, Omulv, Ernst Manker, and Kathleen McFarlane. 1962. "Lapp Life And Customs: A Survey." London: Oxford University Press..
<b>Samoans</b>	Oceania	Polynesia	Horticulturalists	Indirect	Acoustic	Individual	Fish	Decoy*	Buck, Peter Henry. 1930. "Samoan Material Culture." <i>Bulletin</i> . Honolulu, Hawaii: The Museum.
<b>Samoans</b>	Oceania	Polynesia	Horticulturalists	Indirect	Acoustic	Individual	Birds	Decoy*	Buck, Peter Henry. 1930. "Samoan Material Culture." <i>Bulletin</i> . Honolulu, Hawaii: The Museum.
<b>Samoans</b>	Oceania	Polynesia	Horticulturalists	Direct	Acoustic	Group	Sharks	Lure* Luring	Buck, Peter Henry. 1930. "Samoan Material Culture." <i>Bulletin</i> . Honolulu, Hawaii: The Museum.
<b>Samoans</b>	Oceania	Polynesia	Horticulturalists	Indirect	Bait	Individual	Fish	Lure* Luring	Buck, Peter Henry. 1930. "Samoan Material Culture." <i>Bulletin</i> . Honolulu, Hawaii: The Museum.
<b>Samoans</b>	Oceania	Polynesia	Horticulturalists	Indirect	Mixed	Individual	Fish	Decoy*	Buck, Peter Henry. 1930. "Samoan Material Culture." <i>Bulletin</i> . Honolulu, Hawaii: The Museum.
<b>Samoans</b>	Oceania	Polynesia	Horticulturalists	Indirect	Visual	Individual	Fish	Deceive*	Buck, Peter Henry. 1930. "Samoan Material Culture." <i>Bulletin</i> . Honolulu, Hawaii: The Museum.
<b>Samoans</b>	Oceania	Polynesia	Horticulturalists	Indirect	Visual	Individual	Fish	Deception	Stair, John B. 1897. "Old Samoa: Or Flotsam And Jetsam From The Pacific Ocean." London: The Religious Tract Society.
<b>Samoans</b>	Oceania	Polynesia	Horticulturalists	Indirect	Visual	Individual	Fish (squid)	Lure* Luring	Buck, Peter Henry. 1930. "Samoan Material Culture." <i>Bulletin</i> . Honolulu, Hawaii: The Museum.;Holmes, Lowell Don. 1958. "Ta'U: Stability And Change In A Samoan Village." The Polynesian Society, Inc.: Wellington, N.Z.;O'Meara, J. Tim. 1990. "Samoan Planters: Tradition And Economic Development In Polynesia." Case Studies In Cultural Anthropology. Fort Worth: Holt, Rinehart and Winston.
<b>Samoyed</b>	Asia	North Asia	Primarily Hunter-Gatherers	Indirect	Bait	Group	Reindeer	Decoy*	Popov, A. A., and Elaine K. Ristinen. 1966. "Nganasan: The Material Culture Of The Tavgi Samoyeds." <i>Uralic And Altaic Series</i> . Bloomington: Indiana University.
<b>Samoyed</b>	Asia	North Asia	Primarily Hunter-Gatherers	Indirect	Visual	Group	Ducks	Decoy*	Popov, A. A., and Elaine K. Ristinen. 1966. "Nganasan: The Material Culture Of The Tavgi Samoyeds." <i>Uralic And Altaic Series</i> . Bloomington: Indiana University.
<b>San</b>	Africa	Southern Africa	Hunter-gatherers	Direct	Acoustic	Group	Duiker	Imitat*	Hitchcock, Robert K., John E. Yellen, Diane J. Gelburd, Alan J. Osborn, and Aron J. Crowell. 1996. "Subsistence Hunting And Resource Management Among The Ju/'Hoansi Of Northwestern Botswana." <i>African Study Monographs</i> 17 (4): 153-219.
<b>San</b>	Africa	Southern Africa	Hunter-gatherers	Indirect	Acoustic	Group	Kudu	Lure* Luring	Biesele, Megan, and Steve Barclay. 2001. "Ju/'Hoan Women'S Tracking Knowledge And Its



									Contribution To Their Husbands' Hunting Success." <i>African Study Monographs. Ary Issue</i> . [Kyoto, Japan]: Research Committee for African Area Studies, Kyoto University.
<b>San</b>	Africa	Southern Africa	Hunter-gatherers	Direct	Acoustic	Individual	Bovids	Imitat*	Kaufmann, Hans, and Richard Neuse. 1910. "Aun: A Contribution To The Study Of The Bushmen." <i>Mitteilungen Aus Den Deutschen Schutzgebieten</i> 23: HRAF ms: 1-75 [Original: 135-60].
<b>San</b>	Africa	Southern Africa	Hunter-gatherers	Direct	Acoustic	Individual	Wildebeest	Imitat*	Kaufmann, Hans, and Richard Neuse. 1910. "Aun: A Contribution To The Study Of The Bushmen." <i>Mitteilungen Aus Den Deutschen Schutzgebieten</i> 23: HRAF ms: 1-75 [Original: 135-60].
<b>San</b>	Africa	Southern Africa	Hunter-gatherers	Direct	Visual	Individual	Termites	Lure* Luring	Werner, H., and Richard Neuse. 1906. "Anthropological, Ethnological And Ethnographic Observations Concerning The Heikum And Kung Bushmen: With An Appendix On The Languages Of These Bushmen Tribes." <i>Zeitschrift Für Ethnologie</i> 38. Berlin: HRAF MS: 1-35 [Original: 241-68].
<b>Santa Cruz Islanders</b>	Oceania	Melanesia	Horticulturalists	Direct	Acoustic	Individual	Birds	Lure* Luring	Speiser, F., and Frieda Schütze. 1916. "Ethnological Data On The Santa Cruz Islands." <i>Ethnologica</i> 2. Leipzig: HRAF ms: 1-131 [Original: 153-214].
<b>Santa Cruz Islanders</b>	Oceania	Melanesia	Horticulturalists	Indirect	Acoustic	Group	Sharks	Lure* Luring	Davenport, William. 1972. "Social Organization Notes On The Northern Santa Cruz Islands: The Outer Reef Islands." <i>Baessler-Archiv; Beiträge Zur Völkerkunde</i> . Berlin, 11-95.
<b>Santa Cruz Islanders</b>	Oceania	Melanesia	Horticulturalists	Indirect	Mixed	Individual	Birds	Decoy*	Davenport, William. 1962. "Red-Feather Money." <i>Scientific American</i> 206 (3): 94-104.
<b>Santal</b>	Asia	South Asia	Intensive Agriculturalists	Indirect	Mixed	Group	Birds	Decoy*	Culshaw, W. J. 1949. "Tribal Heritage: A Study Of The Santals." <i>Missionary Research Series</i> . London: Lutterworth Press.
<b>Semai</b>	Asia	Southeast Asia	Horticulturalists	N/A	N/A	N/A	N/A	Deceive*	Dentan, Robert Knox. 2008. "Overwhelming Terror: Love, Fear, Peace, And Violence Among Semai Of Malaysia." <i>War And Peace Library</i> . Lanham, Md.: Rowman & Littlefield Publishers.
<b>Semai</b>	Asia	Southeast Asia	Horticulturalists	N/A	N/A	N/A	N/A	Deceive*	Dentan, Robert Knox. 1968. "Semai: A Nonviolent People Of Malaya." <i>Case Studies In Cultural Anthropology</i> . New York: Holt, Rinehart and Winston.
<b>Semang</b>	Asia	Southeast Asia	Hunter-gatherers	Direct	Acoustic	Individual	Birds	Deceive*	Lye, Tuck-Po. 2004. "Changing Pathways: Forest Degradation And The Batek Of Pahang, Malaysia." Lanham: Lexington Books.
<b>Semang</b>	Asia	Southeast Asia	Hunter-gatherers	Direct	Acoustic	Individual	Gibbons	Imitat*	Endicott, Kirk M. 1979. "Batek Negrito Religion: The World-View And Rituals Of A Hunting And Gathering People Of Peninsular Malaysia." Oxford: Clarendon Press ; Oxford University Press.
<b>Semang</b>	Asia	Southeast Asia	Hunter-gatherers	Direct	Acoustic	Individual	Monkey	Lure* Luring	Schebesta, Paul, and Frieda Schütze. 1954. "Negritos Of Asia; Vol. 2, Ethnography Of The Negritos: Half-Vol. 1, Economy And Sociology." <i>Studia Instituti Anthropos</i> . Wien-Mödling: St. - Gabriel-Verlag.
<b>Semang</b>	Asia	Southeast Asia	Hunter-gatherers	Direct	Acoustic	Individual	Birds	Mimic*	Lye, Tuck-Po. 2004. "Changing Pathways: Forest Degradation And The Batek Of Pahang, Malaysia." Lanham: Lexington Books.
<b>Semang</b>	Asia	Southeast Asia	Hunter-gatherers	Direct	Olfactory	Individual	Gibbons	Imitat*	Endicott, Kirk M. 1979. "Batek Negrito Religion: The World-View And Rituals Of A Hunting And Gathering People Of Peninsular Malaysia." Oxford: Clarendon Press ; Oxford University Press.

<b>Seminole</b>	North America	Eastern Woodlands	Horticulturalists	Direct	Acoustic	Individual	Alligator	Imitat*	Indian Affairs, United States. Bureau of, and fl. Nash Roy. 1931. "Seminole Indians: Survey Of The Seminole Indians Of Florida ...." Washington: U. S. Govt. print. off.
<b>Seminole</b>	North America	Eastern Woodlands	Horticulturalists	Direct	Acoustic	Individual	Turkeys	Lure* Luring	MacCauley, Clay. 1887. "Seminole Indians Of Florida." <i>U.S. Bureau Of American Ethnology. Fifth Annual Report, 1883-84.</i> Washington: Smithsonian Institution.
<b>Seminole</b>	North America	Eastern Woodlands	Horticulturalists	Direct	Visual	Individual	Deer	Deceive*	MacCauley, Clay. 1887. "Seminole Indians Of Florida." <i>U.S. Bureau Of American Ethnology. Fifth Annual Report, 1883-84.</i> Washington: Smithsonian Institution.
<b>Shipibo</b>	South America	Amazon and Orinoco	Horticulturalists	Direct	Acoustic	Individual	Birds	Imitat*	Bergman, Roland W. 1980. "Amazon Economics: The Simplicity Of Shipibo Indian Wealth." <i>Dellplain Latin American Studies.</i> Ann Arbor, Mich.: Published for Dept. of Geography, Syracuse University by University Microfilms International.
<b>Sirionó</b>	South America	Amazon and Orinoco	Hunter-gatherers	Direct	Acoustic	?	Tapir	Imitat*	Holmberg, Allan R. 1950. "Nomads Of The Long Bow: The Siriono Of Eastern Bolivia." <i>Smithsonian Institution. Institute Of Social Anthropology.</i> Washington: U.S. Govt. Print. Off.
<b>Sirionó</b>	South America	Amazon and Orinoco	Hunter-gatherers	Direct	Acoustic	?	Peccary	Imitat*	Holmberg, Allan R. 1950. "Nomads Of The Long Bow: The Siriono Of Eastern Bolivia." <i>Smithsonian Institution. Institute Of Social Anthropology.</i> Washington: U.S. Govt. Print. Off.
<b>Sirionó</b>	South America	Amazon and Orinoco	Hunter-gatherers	Direct	Acoustic	?	Monkey	Imitat*	Holmberg, Allan R. 1950. "Nomads Of The Long Bow: The Siriono Of Eastern Bolivia." <i>Smithsonian Institution. Institute Of Social Anthropology.</i> Washington: U.S. Govt. Print. Off.
<b>Sirionó</b>	South America	Amazon and Orinoco	Hunter-gatherers	Direct	Acoustic	?	Birds	Imitat*	Holmberg, Allan R. 1950. "Nomads Of The Long Bow: The Siriono Of Eastern Bolivia." <i>Smithsonian Institution. Institute Of Social Anthropology.</i> Washington: U.S. Govt. Print. Off.
<b>Sirionó</b>	South America	Amazon and Orinoco	Hunter-gatherers	Direct	Acoustic	Individual	Alligator	Imitat*	Holmberg, Allan R. 1950. "Nomads Of The Long Bow: The Siriono Of Eastern Bolivia." <i>Smithsonian Institution. Institute Of Social Anthropology.</i> Washington: U.S. Govt. Print. Off.
<b>Sirionó</b>	South America	Amazon and Orinoco	Hunter-gatherers	Indirect	Acoustic	Individual	Alligator	Imitat*	Holmberg, Allan R. 1950. "Nomads Of The Long Bow: The Siriono Of Eastern Bolivia." <i>Smithsonian Institution. Institute Of Social Anthropology.</i> Washington: U.S. Govt. Print. Off.
<b>Slovenes</b>	Europe	Southeastern Europe	Intensive Agriculturalists	Direct	Bait	Group	Pigs	Lure* Luring	Minnich, Robert Gary. 1979. "Homemade World Of Zagaj." <i>Skriftserie.</i> Bergen, Norway: Sosialantropologisk institutt.
<b>Somali</b>	Africa	Eastern Africa	Pastoralists	Direct	Acoustic	Individual	Birds	Imitat*	Burton Sir, Richard Francis. 1856. "First Footsteps In East Africa: Or An Exploration Of Harar." London: Longman, Brown, Green, and Longmans.
<b>Somali</b>	Africa	East Africa	Pastoralists	Indirect	Visual	Group	Antelope, Ostrich	Decoy*	Lewis, I. M. 1955. "Peoples Of The Horn Of Africa: Somali, Afar, And Saho." <i>Ethnographic Survey Of Africa: Northeastern Africa.</i> London: International African Institute.
<b>Talamancans</b>	Middle America and Caribbean	Central America	Other Subsistence Combinations	Direct	Acoustic	Individual	Mammals	Lure* Luring	Stone, Doris. 1962. "Talamancan Tribes Of Costa Rica." <i>Papers Of The Peabody Museum Of American Archaeology And Ethnology.</i> Cambridge, Mass.: The Peabody Museum.

<b>Tanala</b>	Africa	Southern Africa	Intensive Agriculturalists	Direct	Visual	Individual	Crayfish	Lure* Luring	Linton, Ralph. 1933. "Tanala, A Hill Tribe Of Madagascar." <i>Publication 317. Anthropological Series.</i> Chicago.
<b>Tehuelche</b>	South America	Southern South America	Hunter-gatherers	Indirect	Bait	?	Guanaco	Decoy*	Williams, E. Glynn. 1979. "Ecological Perspective Of Socioterritorial Organization Among The Tehuelche In The Nineteenth Century." <i>Peasants, Primitives, And Proletariats : The Struggle For Identity In South America.</i> The Hague: Mouton.
<b>Ticuna</b>	South America	Amazon and Orinoco	Primarily Hunter-Gatherers	Indirect	Acoustic	Individual	Fish	Imitat*	Nimuendajú, Curt. 1952. "Tukuna." <i>University Of California Publications In Archaeology And Ethnology.</i> Berkeley: University of California Press.
<b>Tikopia</b>	Oceania	Polynesia	Horticulturalists	Direct	Fishing	Individual	Fish	Lure* Luring	Firth, Raymond. 1954. "Sociology Of 'Magic' In Tikopia." <i>Sociologus, N.S.</i> 4. Berlin: 97-116.
<b>Tinuputz</b>	Oceania	Melanesia	Other Subsistence Combinations	Direct	Fire Fishing	Group	Fish	Lure* Luring	Blackwood, Beatrice. 1935. "Both Sides Of Buka Passage: An Ethnographic Study Of Social, Sexual, And Economic Questions In The North-Western Solomon Islands." Oxford: Clarendon Press.
<b>Tinuputz</b>	Oceania	Melanesia	Other Subsistence Combinations	Indirect	Visual	Individual	Fish	Lure* Luring	Blackwood, Beatrice. 1935. "Both Sides Of Buka Passage: An Ethnographic Study Of Social, Sexual, And Economic Questions In The North-Western Solomon Islands." Oxford: Clarendon Press.
<b>Tiv</b>	Africa	Western Africa	Horticulturalists	Direct	Acoustic	Individual	Birds	Imitat*	Downes, Roger Meaden. 1933. "Tiv Tribe." Kaduna: The Government Printer.
<b>Tiv</b>	Africa	Western Africa	Horticulturalists	Direct	Acoustic	Individual	Owls	Imitat*	Downes, Roger Meaden. 1933. "Tiv Tribe." Kaduna: The Government Printer.
<b>Tiwi</b>	Oceania	Australia	Hunter-Gatherers	Indirect	Bait	Group	Kangaroos	Lure* Luring	Hart, C. W. M. (Charles William Merton), and Arnold R. Pilling. 1960. "Tiwi Of North Australia." <i>Case Studies In Cultural Anthropology.</i>
<b>Tiwi</b>	Oceania	Australia	Hunter-Gatherers	Direct	Visual	Group	Geese	Imitat*	Goodale, Jane C. (Jane Carter). 1971. "Tiwi Wives: A Study Of The Women Of Melville Island, North Australia." <i>Monographs Of The American Ethnological Society.</i> Seattle: University of Washington Press.
<b>Tlingit</b>	North America	Northwest Coast and California	Hunter-gatherers	Direct	Acoustic	Individual	Deer	Decoy*	Emmons, George Thornton., and Frederica De Laguna. 1991. "Tlingit Indians." <i>Anthropological Papers Of The American Museum Of Natural History.</i> Seattle: University of Washington Press ; American Museum of Natural History.
<b>Tlingit</b>	North America	Northwest Coast and California	Hunter-gatherers	Direct	Acoustic	Individual	Seals	Lure* Luring	De Laguna, Frederica. 1960. "Story Of A Tlingit Community: A Problem In The Relationship Between Archaeological, Ethnological And Historical Methods." <i>Bulletin.</i> Washington, D.C.: Smithsonian Institution.
<b>Tlingit</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Olfactory	Individual	Birds	Lure* Luring	De Laguna, Frederica. 1972. "Under Mount Saint Elias: The History And Culture Of The Yakutat Tlingit." <i>Smithsonian Contributions To Anthropology.</i> Washington, D.C.: Smithsonian Institution Press;
<b>Tlingit</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Visual	Group	Seals	Decoy*	Laguna, Frederica De. 1960. "Story Of A Tlingit Community: A Problem In The Relationship Between Archaeological, Ethnological And Historical Methods." <i>Bulletin.</i> Washington, D.C.: Smithsonian Institution.
<b>Tlingit</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Visual	Individual	Groundhog	Lure* Luring	De Laguna, Frederica. 1972. "Under Mount Saint Elias: The History And Culture Of The Yakutat Tlingit." <i>Smithsonian Contributions To</i>

									<i>Anthropology</i> . Washington, D.C.: Smithsonian Institution Press;
<b>Tlingit</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Visual	Individual	Fish	Lure* Luring	De Laguna, Frederica. 1972. "Under Mount Saint Elias: The History And Culture Of The Yakutat Tlingit." <i>Smithsonian Contributions To Anthropology</i> . Washington, D.C.: Smithsonian Institution Press; Emmons, George Thornton., and Frederica De Laguna. 1991. "Tlingit Indians." <i>Anthropological Papers Of The American Museum Of Natural History</i> . Seattle: University of Washington Press ; American Museum of Natural History.
<b>Tlingit</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Visual	Group	Deer	Lure* Luring	Knapp, Frances, and Rheta Childe Dorr. 1896. "Thlinkets Of Southeastern Alaska." Chicago: Stone and Kimball.
<b>Tonga</b>	Africa	Southern Africa	Horticulturalists	Direct	Acoustic	?	Duiker	Lure* Luring	Reynolds, Barrie, and Kariba studies (National Museums of Zambia). 1968. "Material Culture Of The Peoples Of The Gwembe Valley." <i>Kariba Studies</i> . New York: Praeger.
<b>Tonga</b>	Africa	Southern Africa	Horticulturalists	Indirect	Acoustic	Individual	Birds	Lure* Luring	Reynolds, Barrie, and Kariba studies (National Museums of Zambia). 1968. "Material Culture Of The Peoples Of The Gwembe Valley." <i>Kariba Studies</i> . New York: Praeger.
<b>Tonga</b>	Africa	Southern Africa	Horticulturalists	Direct	Visual	Individual	Termites	Lure* Luring	Reynolds, Barrie, and Kariba studies (National Museums of Zambia). 1968. "Material Culture Of The Peoples Of The Gwembe Valley." <i>Kariba Studies</i> . New York: Praeger.
<b>Tongans</b>	Oceania	Polynesia	Horticulturalists	Fishing	Fishing	Individual	Fish	Decoy*	Gifford, Edward Winslow. 1929. "Tongan Society." <i>Bulletin</i> . Honolulu, Hawaii: The Museum.
<b>Tongans</b>	Oceania	Polynesia	Horticulturalists	Indirect	Visual	Individual	Birds	Decoy*	Gifford, Edward Winslow. 1929. "Tongan Society." <i>Bulletin</i> . Honolulu, Hawaii: The Museum.
<b>Tongans</b>	Oceania	Polynesia	Horticulturalists	Indirect	Visual	Individual	Fish	Lure* Luring	Buck, Peter Henry (Te Rangi Hiroa). 1935. "Material Representatives Of Tongan And Samoan Gods." <i>Journal Of The Polynesian Society</i> 44: 153-62.; Gifford, Edward Winslow. 1924. "Tongan Myths And Tales." <i>Bulletin</i> . Honolulu, Hawaii: The Museum.
<b>Trobriands</b>	Oceania	Melanesia	Horticulturalists	Indirect	Acoustic	Individual	Sharks	Imitat*	Norrick, Frank Albert. 1992. "Analysis Of The Material Culture Of The Trobriand Islands Based Upon The Collection Of Bronislaw Malinowski." Ann Arbor, Mich.: University Microfilms International.
<b>Trobriands</b>	Oceania	Melanesia	Other Subsistence Combinations	Direct	Acoustic	Individual	Birds	Imitat*	Malinowski, Bronislaw. 1935. "Coral Gardens And Their Magic: A Study Of The Methods Of Tilling The Soil And Of Agricultural Rites In The Trobriand Islands. Vol. One, The Description Of Gardening." New York: American Book Company.
<b>Tubatubbal</b>	North America	Northwest Coast and California	Hunter-gatherers	Direct	Visual	Individual	Deer	Decoy*	Voegelin, Mrs. Erminie Wheeler. 1938. "Tubatubbal Ethnography." <i>Anthropological Records</i> . Berkeley: University of California Press.
<b>Tukano</b>	South America	Amazon and Orinoco	Other Subsistence Combinations	N/A	N/A	N/A	N/A	Imitat*	Jackson, Jean E. (Jean Elizabeth). 1983. "Fish People: Linguistic Exogamy And Tukanoan Identity In Northwest Amazonia." <i>Cambridge Studies In Social Anthropology</i> . Cambridge [Cambridgeshire]: Cambridge University Press. 012...Silva, Alcionilio Bruzzi Alves da, and Ivana Lillios. 1962. "Indigenous Civilization Of The Uaupés." <i>Centro</i>

									De Pesquisas De Iauareté. Sao Paulo: Centro de Pesquisas de Iauareté.
<b>Tupinamba</b>	South America	Eastern South America	Primarily Hunter-Gatherers	N/A	N/A	N/A	N/A	Deceive*	Thevet, André, and Alfred Métraux. 1575. "Universal Cosmography." Paris.
<b>Ulithi</b>	Oceania	Micronesia	Other Subsistence Combinations	Indirect	Fishing	?	Fish	Lure* Luring	Lessa, William Armand. 1950. "Ethnography Of Ulithi Atoll." <i>Cima Report</i> . Los Angeles: University of California.
<b>Ute</b>	North America	Southwest and Basin	Hunter-gatherers	Direct	Acoustic	Individual	Rabbit	Imitat*	Smith, Anne M. (Anne Milne). 1974. "Ethnography Of The Northern Utes." <i>Papers In Anthropology</i> . Santa Fe: Museum of New Mexico Press.
<b>Ute</b>	North America	Southwest and Basin	Hunter-gatherers	Direct	Acoustic	Individual	Deer	Imitat*	Smith, Anne M. (Anne Milne). 1974. "Ethnography Of The Northern Utes." <i>Papers In Anthropology</i> . Santa Fe: Museum of New Mexico Press..
<b>Ute</b>	North America	Southwest and Basin	Hunter-gatherers	?	Visual	?	Deer	Decoy*	Smith, Anne M. (Anne Milne). 1974. "Ethnography Of The Northern Utes." <i>Papers In Anthropology</i> . Santa Fe: Museum of New Mexico Press.
<b>Warao</b>	South America	Amazon and Orinoco	Hunter-gatherers	Indirect	Acoustic	Individual	Birds	Decoy*	Suárez, Maria Matilde, and Sydney Muirden. 1968. "Warao: Natives Of The Orinoco Delta." Caracas: Departamento de Antropología, Instituto Venezolano de Investigaciones Científicas.
<b>Warao</b>	South America	Amazon and Orinoco	Hunter-gatherers	Direct	Acoustic	Individual	Guinea Pigs	Imitat*	Heinen, H. Dieter. 1973. "Adaptive Changes In A Tribal Economy: A Case Study Of The Winikina-Warao." Ann Arbor, Mich.: University Microfilms.
<b>Warao</b>	South America	Amazon and Orinoco	Hunter-gatherers	Direct	Acoustic	Group	Jaguar	Lure* Luring	Turrado Moreno, Angel, and Sydney Muirden. 1945. "Ethnography Of The Guarauno Indians." <i>Tercera Conferencia Interamericana De Agricultura, Cuadernos Verdes</i> . Caracas: Lit. y Tip. Vargas.
<b>Warao</b>	South America	Amazon and Orinoco	Hunter-Gatherers	Fishing	Fishing	Individual	Fish	Deceive*	Turrado Moreno, Angel, and Sydney Muirden. 1945. "Ethnography Of The Guarauno Indians." <i>Tercera Conferencia Interamericana De Agricultura, Cuadernos Verdes</i> . Caracas: Lit. y Tip. Vargas.
<b>Warao</b>	South America	Amazon and Orinoco	Hunter-gatherers	Direct	Fishing	Group	Fish	Lure* Luring	Wilbert, Johannes. 1972. "Fishermen: The Warao Of The Orinoco Delta." <i>Survivors Of Eldorado; Four Indian Cultures Of South America</i> . New York: Praeger Publishers.
<b>Western Apache</b>	North America	Southwest and Basin	Primarily Hunter-Gatherers	Direct	Acoustic	Individual	Deer	Lure* Luring	Buskirk, Winfred. 1986. "Western Apache: Living With The Land Before 1950." <i>Civilization Of The American Indian Series</i> . Norman [Okla.]: University of Oklahoma Press.
<b>Western Apache</b>	North America	Southwest and Basin	Primarily Hunter-Gatherers	Direct	Visual	Group	Antelope	Imitat*	Buskirk, Winfred. 1986. "Western Apache: Living With The Land Before 1950." <i>Civilization Of The American Indian Series</i> . Norman [Okla.]: University of Oklahoma Press.
<b>Western Woods Cree</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Bait	Individual	Beavers	Lure* Luring	Mason, Leonard. 1967. "Swampy Cree: A Study In Acculturation." <i>Anthropology Papers</i> . Ottawa: Queen's Printer.; Vecsey, Christopher. 1983. "Traditional Ojibwa Religion And Its Historical Changes." Memoirs. Philadelphia: American Philosophical Society.
<b>Western Woods Cree</b>	North America	Arctic and Subarctic	Hunter-gatherers	Indirect	Mixed	Individual	Birds	Decoy*	Mason, Leonard. 1967. "Swampy Cree: A Study In Acculturation." <i>Anthropology Papers</i> . Ottawa: Queen's Printer.

<b>Wogeo</b>	Oceania	Melanesia	Other Subsistence Combinations	Indirect	Fishing	?	Fish	Lure* Luring	Hogbin, Herbert Ian. 1970. "Island Of Menstruating Men: Religion In Wogeo, New Guinea." <i>Chandler Publications In Anthropology And Sociology</i> . Scranton [Pa.]: Chandler Pub. Co.
<b>Woleai Region</b>	Oceania	Micronesia	Other Subsistence Combinations	Direct	Acoustic	Individual	Fish	Lure* Luring	Burrows, Edwin G. (Edwin Grant), and Melford E. Spiro. 1953. "Atoll Culture: Ethnography Of Ifaluk In The Central Carolines." <i>Behavior Science Monographs</i> . New Haven: Human Relations Area Files.
<b>Woleai Region</b>	Oceania	Micronesia	Other Subsistence Combinations	Indirect	Fishing	Individual	Fish	Lure* Luring	Krämer, Augustin. 1937. "Central Carolines: Part I: The Lamotrek Group, Woleai." Hamburg: Friederichsen, De Gruyter und Co.; Spiro, Melford E. 1949. "Ifaluk: A South Sea Culture." Washington: Pacific Science Board, National Research Council.
<b>Woleai Region</b>	Oceania	Micronesia	Other Subsistence Combinations	Indirect	Visual	Individual	Fish	Lure* Luring	Alkire, William H. 1965. "Lamotrek Atoll And Inter-Island Socioeconomic Ties." <i>Illinois Studies In Anthropology</i> . Urbana: University of Illinois Press; Burrows, Edwin G. (Edwin Grant), and Melford E. Spiro. 1953. "Atoll Culture: Ethnography Of Ifaluk In The Central Carolines." <i>Behavior Science Monographs</i> ; Burrows, Edwin G. (Edwin Grant). 1963. "Flower In My Ear: Arts And Ethos Of Ifaluk Atoll." University Of Washington Publication In Anthropology. Seattle: University of Washington Press.; Damm, Hans, and C. Sherman. 1938. "Central Carolines: Part Ii: Ifaluk, Aurepik, Faraulip, Sorol, Mog-Mog: Part Ii: Ifaluk, Aurepik, Faraulip, Sorol, Mog-Mog." Hamburg: Friederichsen, De Gruyter and Co.
<b>Xokleng</b>	South America	Eastern South America	Hunter-gatherers	Direct	Acoustic	Individual	Tapir	Deceive*	Henry, Jules, Ruth Benedict, and Hans F. Kraus. 1941. "Jungle People: A Kaingang Tribe Of The Highlands Of Brazil." Locust Valley, New York: J. J. Augustin.
<b>Xokleng</b>	South America	Eastern South America	Hunter-gatherers	Indirect	Acoustic	Individual	Birds	Decoy*	Skoggard, Ian A., and John Beierle. 2012. "Culture Summary: Xokleng." New Haven, Conn.: Human Relations Area Files.
<b>Xokleng</b>	South America	Eastern South America	Hunter-gatherers	Direct	Acoustic	Individual	Monkey	Imitat*	Henry, Jules, Ruth Benedict, and Hans F. Kraus. 1941. "Jungle People: A Kaingang Tribe Of The Highlands Of Brazil." Locust Valley, New York: J. J. Augustin.
<b>Yahgan</b>	South America	Southern South America	Hunter-gatherers	Indirect	Acoustic	Individual	Birds	Decoy*	Gusinde, Martin, and Frieda Schütze. 1937. "Yahgan: The Life And Thought Of The Water Nomads Of Cape Horn." <i>Die Feuerland-Indianer [The Fuegian Indians]</i> . Mödling Bei Wein: Anthros-Bibliothek.
<b>Yahgan</b>	South America	Southern South America	Hunter-gatherers	Direct	Acoustic	Individual	Seals	Lure* Luring	Gusinde, Martin, and Frieda Schütze. 1937. "Yahgan: The Life And Thought Of The Water Nomads Of Cape Horn." <i>Die Feuerland-Indianer [The Fuegian Indians]</i> . Mödling Bei Wein: Anthros-Bibliothek.
<b>Yahgan</b>	South America	Southern South America	Hunter-gatherers	Direct	Acoustic	Individual	Birds	Lure* Luring	Gusinde, Martin, and Frieda Schütze. 1937. "Yahgan: The Life And Thought Of The Water Nomads Of Cape Horn." <i>Die Feuerland-Indianer [The Fuegian Indians]</i> . Mödling Bei Wein: Anthros-Bibliothek.

<b>Yahgan</b>	South America	Southern South America	Hunter-gatherers	Fishing	Fishing	Individual	Fish	Deceive*	Gusinde, Martin, and Frieda Schütze. 1937. "Yahgan: The Life And Thought Of The Water Nomads Of Cape Horn." <i>Die Feuerland-Indianer [The Fuegian Indians]</i> . Mödling Bei Wein: Anthropos-Bibliothek.
<b>Yahgan</b>	South America	Southern South America	Hunter-gatherers	Indirect	Visual	Individual	Birds	Deceive*	Gusinde, Martin, and Frieda Schütze. 1937. "Yahgan: The Life And Thought Of The Water Nomads Of Cape Horn." <i>Die Feuerland-Indianer [The Fuegian Indians]</i> . Mödling Bei Wein: Anthropos-Bibliothek.
<b>Yakut</b>	Asia	North Asia	Other Subsistence Combinations	Indirect	Bait	Group	Reindeer	Decoy*	Popov, A. A. 1964. "Dolgans." <i>Peoples Of Siberia</i> . Chicago, Ill.: University of Chicago Press. i
<b>Yakut</b>	Asia	North Asia	Other Subsistence Combinations	Indirect	Visual	Group	Bears	Decoy*	Sieroszewski, Waclaw. 1993. "Yakut: An Experiment In Ethnographic Research." Moskva: Assotsiatsiia "Rossiiskaia polit. entsiklopediia."
<b>Yakut</b>	Asia	North Asia	Other Subsistence Combinations	Indirect	Visual	Individual	Birds	Lure* Luring	Sieroszewski, Waclaw. 1993. "Yakut: An Experiment In Ethnographic Research." Moskva: Assotsiatsiia "Rossiiskaia polit. entsiklopediia."
<b>Yanoama</b>	South America	Amazon and Orinoco	Horticulturalists	Direct	Acoustic	Individual	Animals	Imitat*	Becher, Hans, and Frieda Schütze. 1960. "Surara And Pakidai, Two Yanoama Tribes In Northwest Brazil." <i>Mitteilungen</i> . Hamburg: Kommissionsverlag Cram, De Gruyter & Co..
<b>Yapese</b>	Oceania	Micronesia	Other Subsistence Combinations	Indirect	Bait	?	Crabs	Lure* Luring	Müller, Wilhelm. 1917. "Yap." <i>Hamburgische Wissenschaftliche Stiftung, Ergebnisse Der Südsee-Expedition 1908-1910, Ii</i> . Hamburg: L. Friederichsen & Co.
<b>Yapese</b>	Oceania	Micronesia	Other Subsistence Combinations	Direct	Fire Fishing	Group	Fish	Lure* Luring	Volkens, G. 1901. "Concerning The Carolines Island Of Yap." <i>Verhandlungen Der Gesellschaft Für Erkunde Zu Berlin</i> 28. [Berlin]: HRAF ms: 1–20 [original: 62–76].
<b>Yapese</b>	Oceania	Micronesia	Other Subsistence Combinations	Indirect	Fishing	?	Fish	Lure* Luring	Müller, Wilhelm. 1917. "Yap." <i>Hamburgische Wissenschaftliche Stiftung, Ergebnisse Der Südsee-Expedition 1908-1910, Ii</i> . Hamburg: L. Friederichsen & Co.
<b>Yapese</b>	Oceania	Micronesia	Other Subsistence Combinations	Indirect	Visual	Individual	Fish	Imitat*	Müller, Wilhelm. 1917. "Yap." <i>Hamburgische Wissenschaftliche Stiftung, Ergebnisse Der Südsee-Expedition 1908-1910, Ii</i> . Hamburg: L. Friederichsen & Co.
<b>Yokuts</b>	North America	Northwest Coast and California	Hunter-gatherers	Direct	Bait	Group	Bears	Lure* Luring	Gayton, A. H. (Anna Hadwick). 1948. "Yokuts And Western Mono Ethnography: Vol. 1, Tulare Lake, Southern Valley, And Central Foothill Yokuts." <i>Anthropological Records</i> . Berkeley: Univ. of California Press.
<b>Yokuts</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Bait	Individual	Birds	Lure* Luring	Gayton, A. H. (Anna Hadwick). 1948. "Yokuts And Western Mono Ethnography: Vol. 1, Tulare Lake, Southern Valley, And Central Foothill Yokuts." <i>Anthropological Records</i> . Berkeley: Univ. of California Press.
<b>Yokuts</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Bait	Individual	Bears	Lure* Luring	Gayton, A. H. (Anna Hadwick). 1976. "Culture-Environment Integration: External References In Yokuts Life." <i>Native Californians : A Theoretical Retrospective</i> . Ramona, Calif.: Ballena Press.
<b>Yokuts</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Mixed	Individual	Eagles	Decoy*	Gayton, A. H. (Anna Hadwick). 1948. "Yokuts And Western Mono Ethnography: Vol. 1, Tulare Lake, Southern Valley, And Central Foothill Yokuts." <i>Anthropological Records</i> . Berkeley: Univ. of California Press.

<b>Yokuts</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Mixed	Individual	Birds	Decoy*	Gayton, A. H. (Anna Hadwick). 1948. "Yokuts And Western Mono Ethnography: Vol. 1, Tulare Lake, Southern Valley, And Central Foothill Yokuts." <i>Anthropological Records</i> . Berkeley: Univ. of California Press.
<b>Yokuts</b>	North America	Northwest Coast and California	Hunter-gatherers	Direct	Visual	Individual	Deer	Decoy*	Kroeber, A. L. (Alfred Louis). 1953. "Yokuts." <i>Handbook Of The Indians Of California</i> . Berkeley: California Book Company Ltd.
<b>Yokuts</b>	North America	Northwest Coast and California	Hunter-gatherers	Direct	Visual	Group	Antelope	Decoy*	Latta, Frank Forrest. 1949. "Handbook Of Yokuts Indians." Oildale, Calif.: Bear State Books.
<b>Yokuts</b>	North America	Northwest Coast and California	Hunter-gatherers	Indirect	Visual	Individual	Waterfowl	Decoy*	Wallace, William James. 1978. "Southern Valley Yokuts." <i>Handbook Of North American Indians. California</i> . Washington, D. C.: Smithsonian Institution : For sale by the Supt. of Docs., U.S. G.P.O.
<b>Yuki</b>	North America	Northwest Coast and California	Hunter-gatherers	Direct	Visual	Individual	Deer	Decoy*	Gifford, Edward Winslow. 1965. "Coast Yuki." Sacramento, Calif.: Sacramento Anthropological Society, Sacramento State College.
<b>Yurok</b>	North America	Northwest Coast and California	Hunter-gatherers	Direct	Visual	Individual	Predators	Deceive*	Kroeber, A. L. (Alfred Louis). 1925. "Handbook Of The Indians Of California." <i>Bulletin</i> . Washington: Government Printing Office.
<b>Yurok</b>	North America	Northwest Coast and California	Hunter-gatherers	Direct	Visual	?	Deer	Decoy*	Kroeber, A. L. (Alfred Louis). 1925. "Handbook Of The Indians Of California." <i>Bulletin</i> . Washington: Government Printing Office.
<b>Zulu</b>	Africa	Southern Africa	Agro-Pastoralists	Direct	Acoustic	Individual	Birds	Imitat*	Grout, Lewis. 1864. "Zululand: Or, Life Among The Zulu-Kafirs Of Natal And Zulu-Land, South Africa. With Map, And Illustrations, Largely From Original Photographs." Philadelphia: Presbyterian Publication Company. .
<b>Zuni</b>	North America	Southwest and Basin	Intensive Agriculturalists	Direct	Visual	Group	Deer	Imitat*	Stevenson, Matilda Coxe Evans. 1904. "Zuni Indians: Their Mythology, Esoteric Fraternities, And Ceremonies." <i>U.S. Bureau Of American Ethnology. Twenty-Third Annual Report. 1901-1902</i> . Washington: Government Printing Office.