



FIGURE 3.13

The male soapberry bug on the left is guarding the (larger) female below him. Biologist Scott Carroll painted numbers on the bugs in order to identify individuals. (Photograph courtesy of Scott Carroll.)

Jadera haematoloma

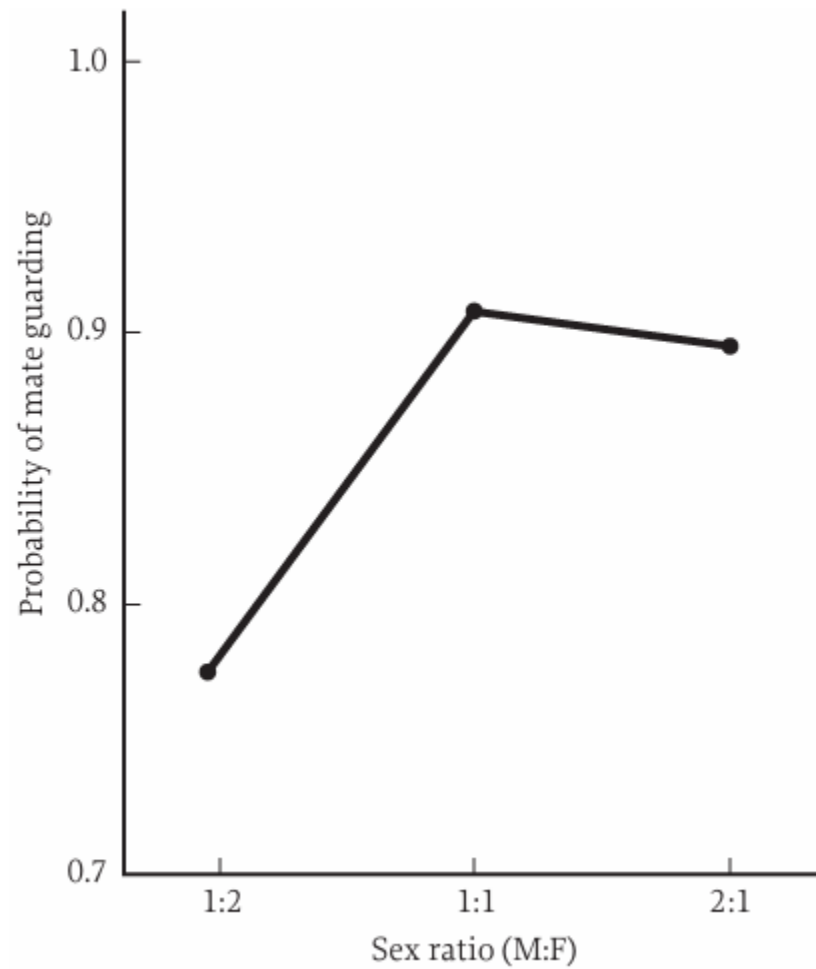


FIGURE 3.14 The probability of mate guarding is a function of sex ratio in this population of the soapberry bug. Males are less likely to guard their mates when females are relatively more common than when they are relatively rare.

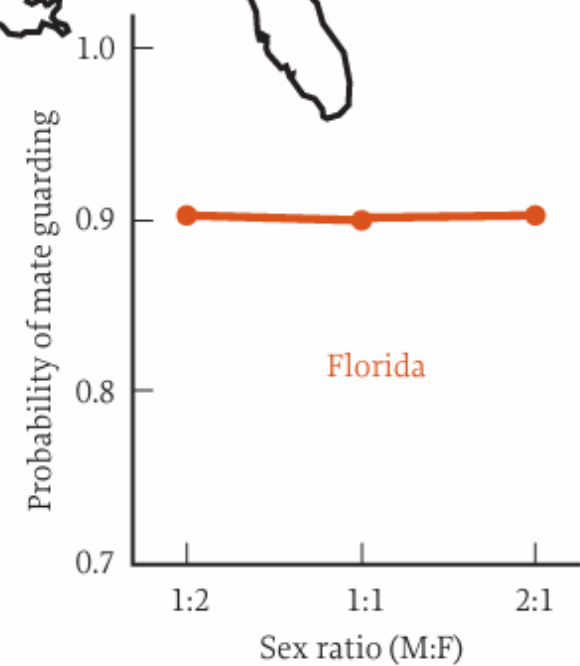
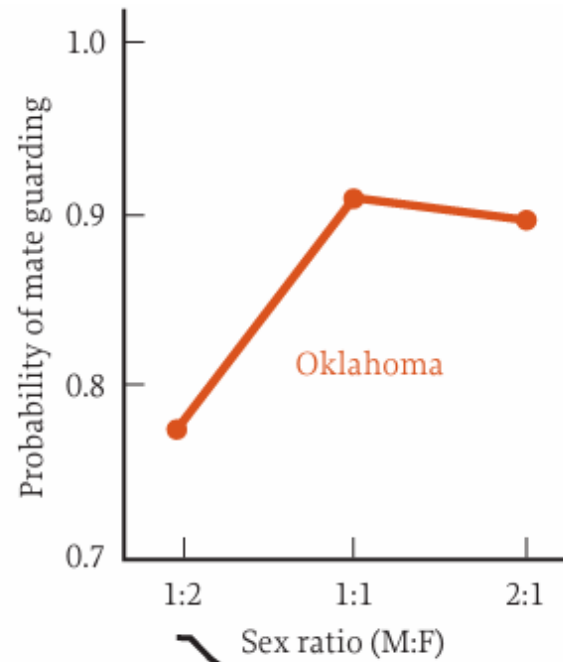


FIGURE 3.15 The average probability of mate guarding varies between populations of soapberry bugs in Oklahoma and Florida. In Oklahoma, males are more likely to guard when females are relatively rare; in Florida, males do not vary their mate-guarding behavior in relation to the local sex ratio.

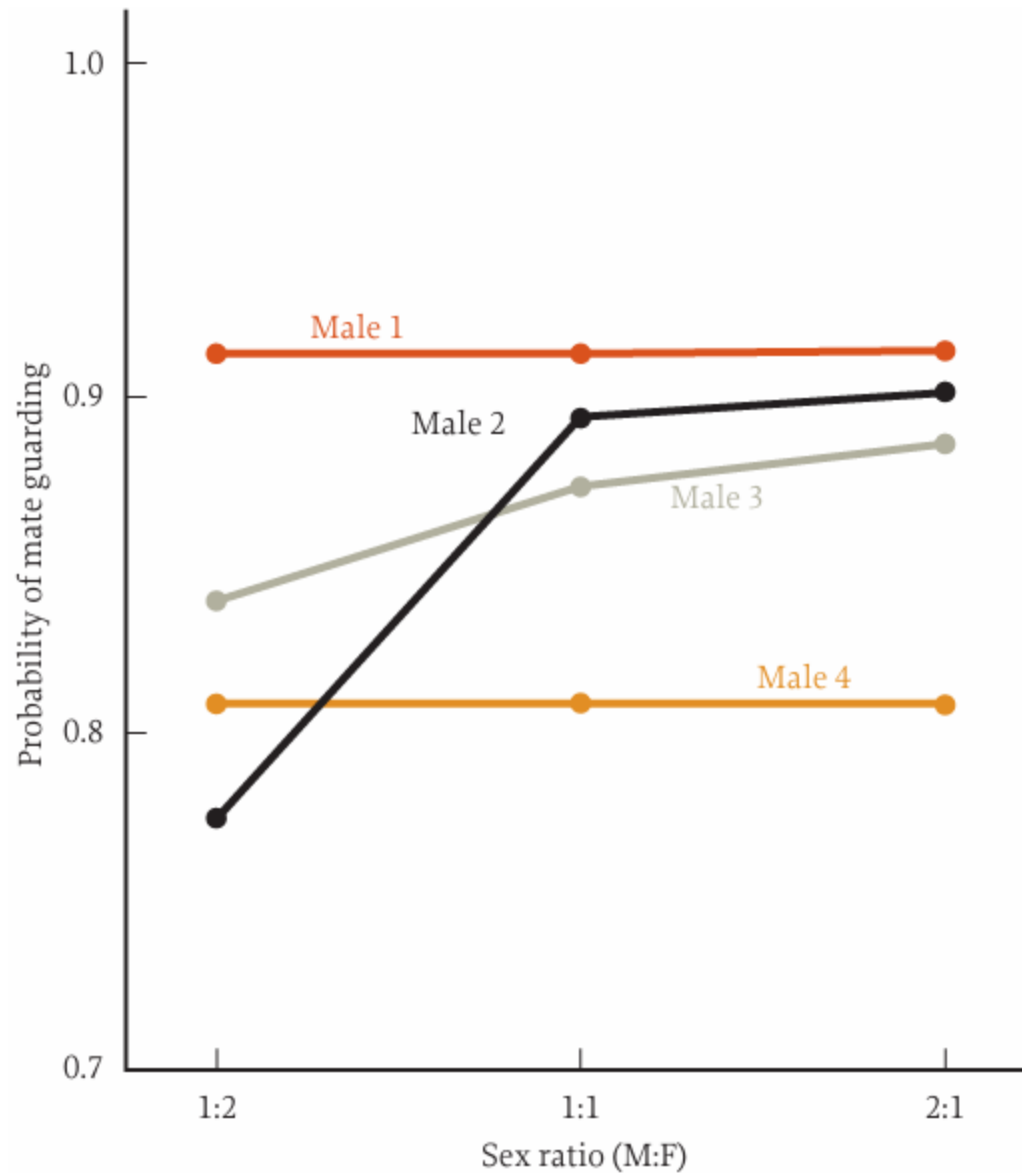


FIGURE 3.16 There is genetic variation in the behavioral rules of individual soapberry bugs, illustrated here by four representative individuals. There is variation in both the level of mate guarding (for example, male 1 spends more time guarding mates than male 4 does for all sex ratios) and in the amount of plasticity (for example, the behavior of males 1 and 4 does not change, the behavior of male 3 changes a bit, and the behavior of male 2 changes a lot). If this variation is heritable, the rule that works best, averaged over all of the environments of the population, will tend to increase.



Religion as a means to assure paternity

Beverly I. Strassmann^{a,1}, Nikhil T. Kurapati^a, Brendan F. Hug^a, Erin E. Burke^b, Brenda W. Gillespie^c, Tatiana M. Karafet^d, and Michael F. Hammer^{d,e}

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Edited by Rich Sosis, University of Connecticut, Storrs, CT 06269, and accepted by the Editorial Board May 1, 2012 (received for review June 27, 2011)

The sacred texts of five world religions (Buddhism, Christianity, Hinduism, Islam, and Judaism) use similar belief systems to set limits on sexual behavior. We propose that this similarity is a shared cultural solution to a biological problem: namely male uncertainty over the paternity of offspring. Furthermore, we propose the hypothesis that religious practices that more strongly regulate female sexuality should be more successful at promoting paternity certainty. Using genetic data on 1,706 father–son pairs, we tested this hypothesis in a traditional African population in which multiple religions (Islam, Christianity, and indigenous) coexist in the same families and villages. We show that the indigenous religion enables males to achieve a significantly ($P = 0.019$) lower probability of cuckoldry (1.3% versus 2.9%) by enforcing the honest signaling of menstruation, but that all three religions share tenets aimed at the avoidance of extrapair copulation. Our findings provide evidence for high paternity certainty in a traditional African population, and they shed light on the reproductive agendas that underlie religious patriarchy.

evolution | extrapair paternity | mating | nonpaternity | Y DNA

The major world religions sprang from patriarchal societies in which the resources critical to reproduction, whether in the form of land or livestock, were inherited from father to son down the male line (1–3). Consistent with patrilineal inheritance, the sacred texts set forth harsh penalties for adultery and other behaviors that lower the husband's probability of paternity (4–8) (*SI Discussion*). The scriptures also place greater emphasis on female than on male chastity, including the requirement of modest attire for women and the idealization of virginity for unmarried females (6, 8). Previous studies have considered the

a neglected terrain despite growing interest in the evolutionary biology of religion (17–22).

We show that paternity certainty was higher in the indigenous religion than in Christianity, which we attribute to the abandonment of menstrual taboos by the Christians. Women in the traditional religion are exiled for five nights to uncomfortable places called menstrual huts; during the day menstruating women work in the fields (23, 24). The indigenous religion uses the ideology of menstrual pollution as the supernatural enforcement mechanism to coerce women to disclose their menses by going to the menstrual hut. Hormonal data showed that fear of breaking these religious taboos enforced honest signaling to the men of the husband's family, who situate the menstrual huts in close proximity to the *toguna*, which is a shade shelter specific to the males of a given patrilineage (23). The Dogon do not practice contraception, and 83% of women have high fertility (7–13 live births) (25). The median duration of lactational amenorrhea is 20 mo, and menstruation is a rare event quickly followed by pregnancy (23, 26, 27). When a woman resumes going to the menstrual hut following her last birth, the husband's patrilineage is informed of the immanency of conception and cuckoldry risk. Precautions include postmenstrual copulation initiated by the husband and enhanced vigilance by his family (23, 24).

Results and Discussion

Across all religions, we detected father–son Y DNA mismatches in only 1.8% of father–son pairs (Fig. 1), a finding that contradicts the prevailing view that traditional populations have high rates of cuckoldry (28, 29). Although a similar rate has been found in several modern populations (29, 30), a key difference is that the Dogon do not use contraception (16, 25). The prev-

Evoluční psychologie

Darwinian psychologists

- Historie:

- 80. léta – krystalizuje nové **evoluční studium člověka**
- **Rozdíly** oproti BE jsou v důrazu na:



Santa Barbara school

Leda Cosmides & John Tooby
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 - **univerzalitu** oproti kulturním rozdílům



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Otázky

- Hlavní premisa:

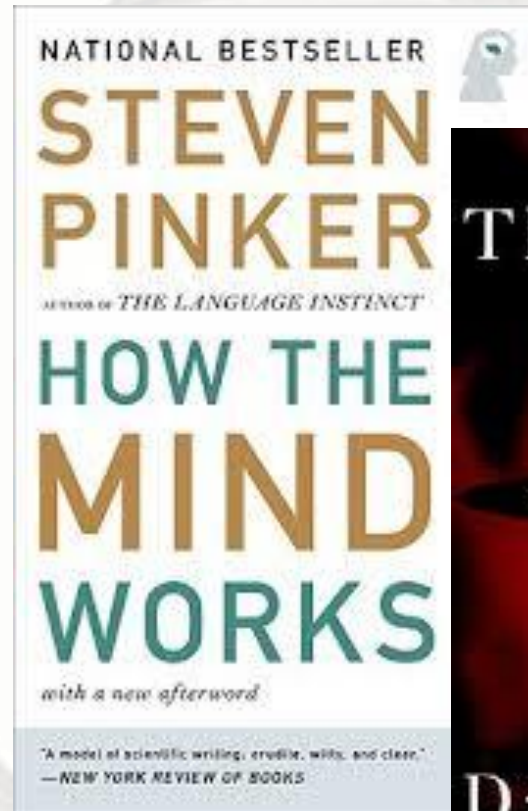
Pokud chceme zkoumat lidské chování z evoluční perspektivy, nemůžeme očekávat jeho adaptivnost v současném umělém moderním prostředí, nýbrž musíme objevovat **evolučně vyvinuté psychologické adaptace**, na kterých je lidské chování založené.

- Otázky:

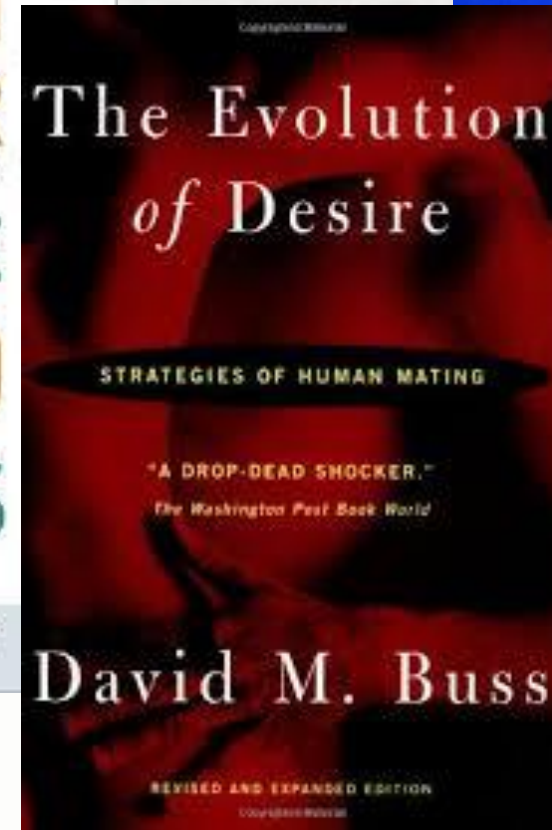
- Jaké vyvinuté psychologické mechanismy produkují univerzální mentální a behaviorální charakteristiky?
- Jaké selektivní tlaky utvořily psychologické mechanismy?

Východiska

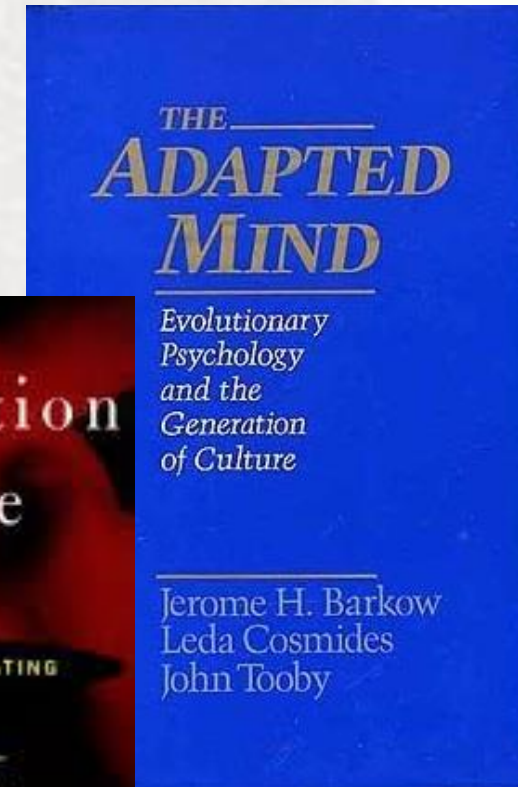
- Prostředí současných lidských populací (moderní města, domy, instituce) jsou velmi odlišná od prostředí v němž žili naši předkové => **adaptive lag**
- Adaptive lag => **nemůžeme očekávat adaptivnost v současném prostředí**
- Adaptive lag => **mysl doby kamenné**



1997



1994



1992

Koncepty



Koncepty

- Prostředí evolučních adaptací (EEA)

- John Bowlby (1969) – child attachment
- Pleistocén (1,7 mil – 10 tis př.n.l.)
- lovci a sběrači starší doby kamenné (paleolit)



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- Psychologické mechanismy
 - Obvody zpracovávající informace v našich mozcích, které utváří chování
 - pro některé včetně emoční kognice (žárliivost, strach z pavouků a hadů, citlivost vůči podvádění...)
 - vrozené, instinktivní



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 - vrozené, instinktivní
- Modularita mysli



Modularita mysli

- doménově specifické mentální orgány/orgány
 - některé domény jsou zásadnější pro přežití než jiné a tak se je učíme snáz a rychleji (např. že je nám zle z jídla)
- evolučně vyvinutá řešení výzev z EEA
- inspirace z kognitivní revoluce – analogie z kybernetiky
 - general-purpose by byl nepřesný (příliš chybný) a nákladný
- X dnes na druhou stranu „predictive processing theory“ (v omezeném čase nejde vyhodnocovat input, jen trošku z něj)



Žárlivost



Žárlivost

- doménová specificita – mating behavior



Žárlivost

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- adaptační výhoda
 - partner, který je puzen k akci při přehnaném zájmu partnera o jiného člověka (potenciálního partnera) bude mít výhodu oproti tomu, kterému je lhostejné být nahrazen či podveden



Žárlivost

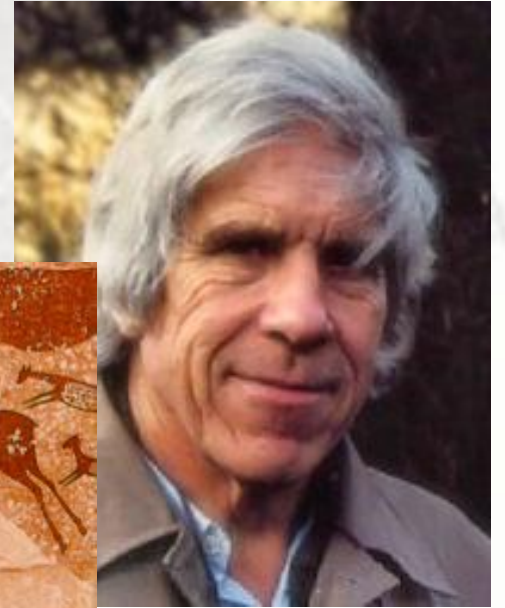
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- následná akce už se může lišit
 - dle velikosti muže, dle velikosti soka, dalších osobnostních rysech etc. může dojít k vyhrožování, agresí, zvýšenému hlídání nebo např. zvýšenému plnění jeho tužeb



Metody

- laboratorní + terénní experimenty + dotazníky

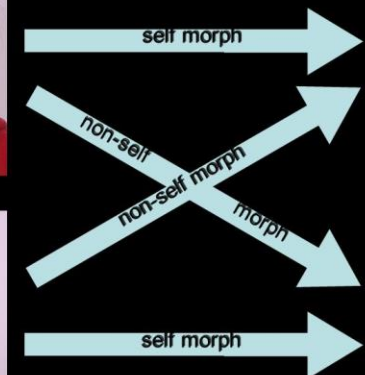
Postup:



Participants



Morphs

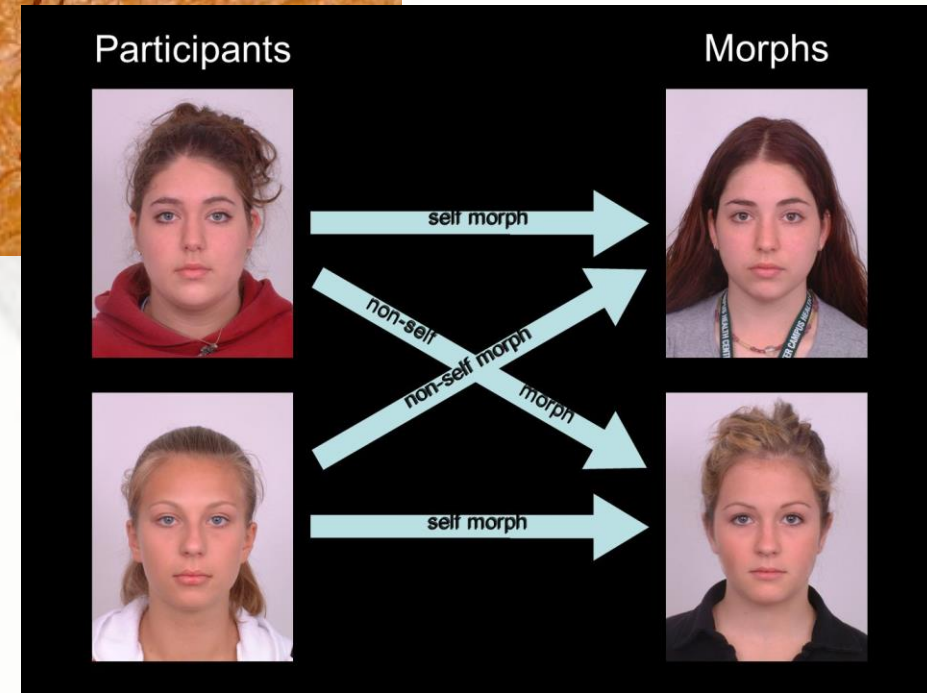
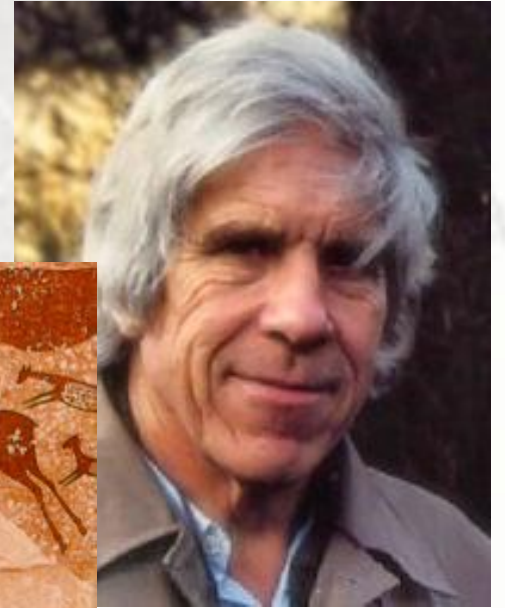


Metody

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- A) Identifikovat specifické adaptivní výzvy z prostředí naší dávné evoluční historie (určení selektivních tlaků).

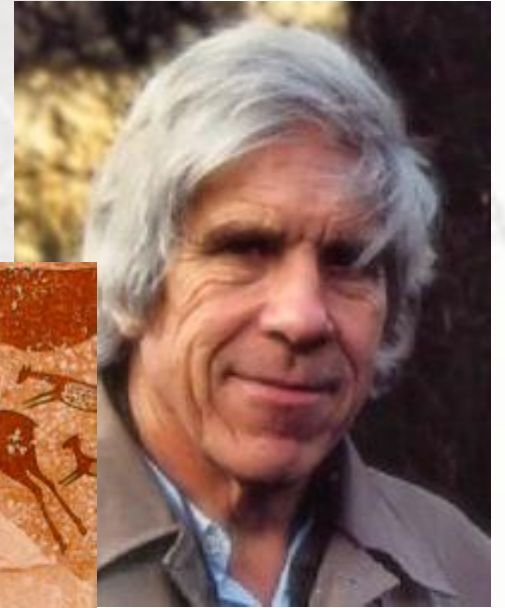


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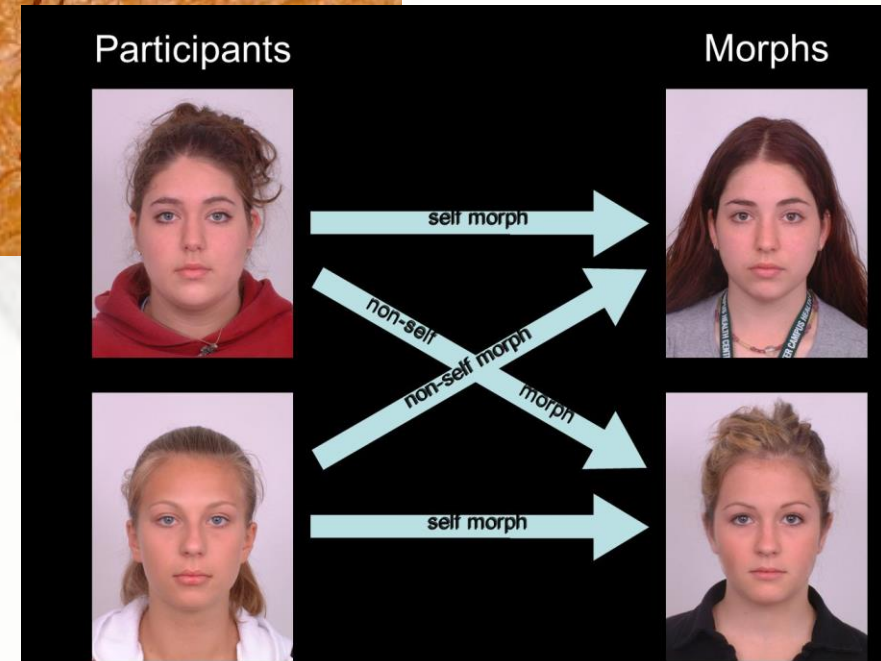
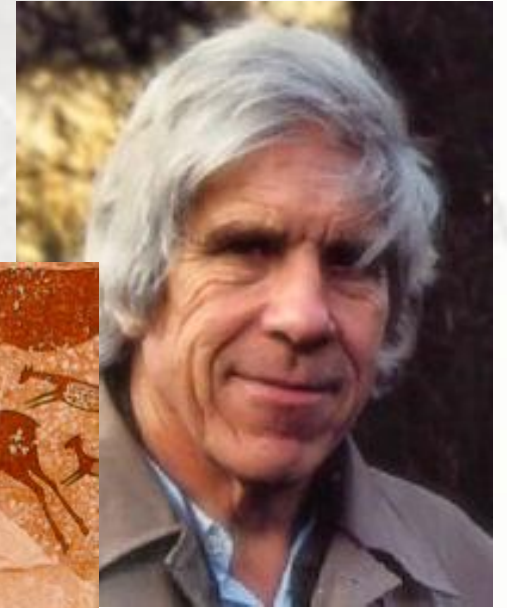


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- Specifikovat jaký druh chování (konceptů a norem) by musel být na základě těchto mechanismů u lidí široce rozšířen.

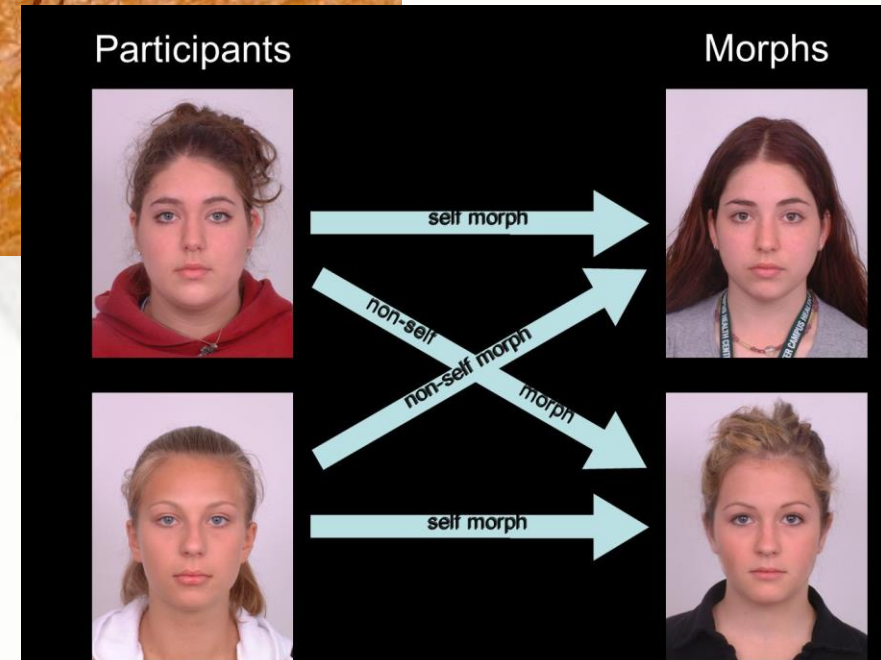
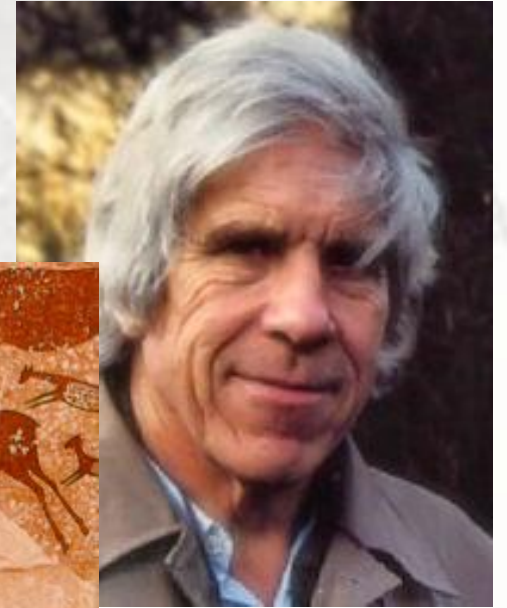
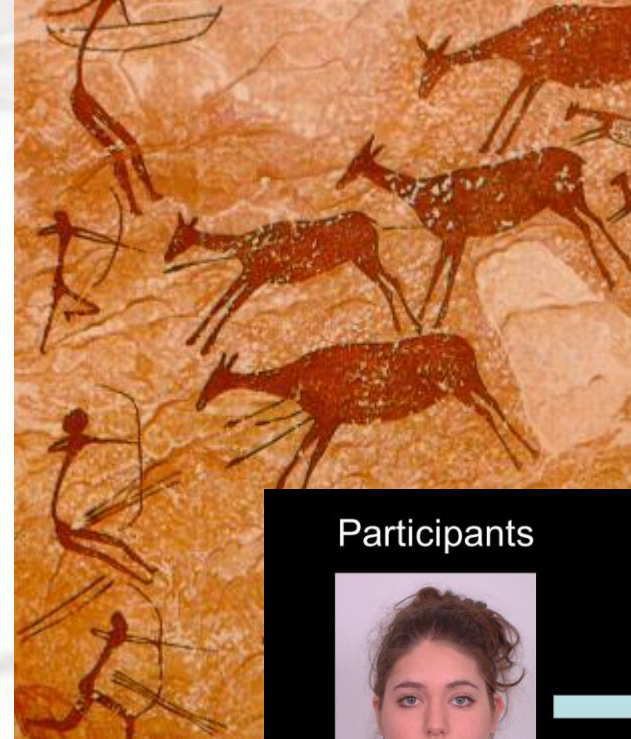


Metody

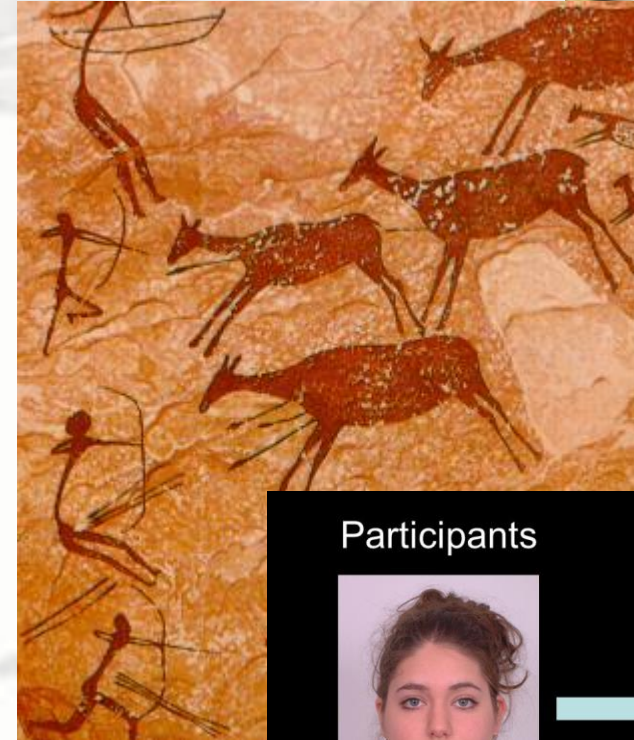
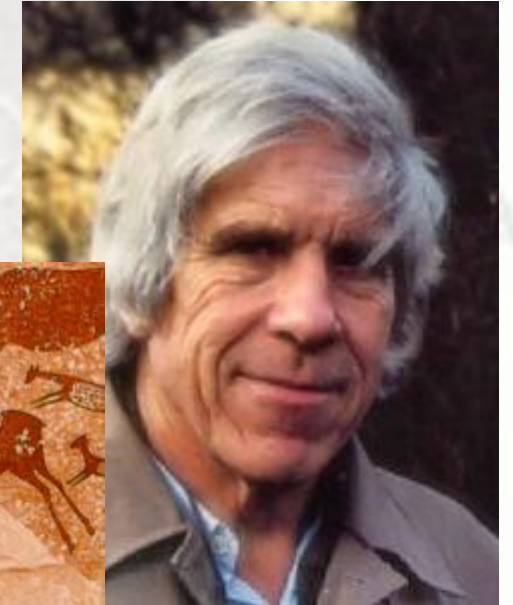
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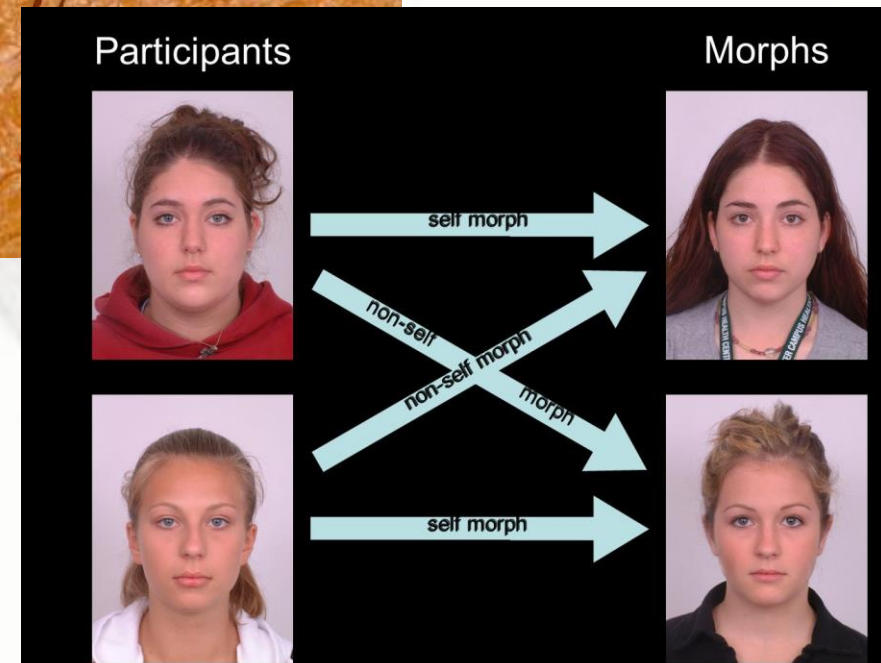
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- laboratorní + terénní experimenty + dotazníky

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- D) Vytvořit nové experimentální protokoly, které by pomohly potvrdit či vyvrátit existenci těchto mechanismů.
- E) Otestovat rozšíření experimentálně (nebo na základě etnografických záznamů, např. databáze).







Would you rather be stuck in a forest with a man you don't know or a bear?



Sex differences in mate choice

(Buss 1994)

Women across all continents, all political systems (including socialism and communism), all racial groups, all religious groups, and all systems of mating (from intense polygyny to presumptive monogamy) place more value than men on good financial prospects.

Men worldwide want physically attractive, young, and sexually loyal wives who will remain faithful to them until death. These preferences cannot be attributed to Western culture, to capitalism, to white Anglo-Saxon bigotry, to the media, or to incessant brainwashing by advertisers.

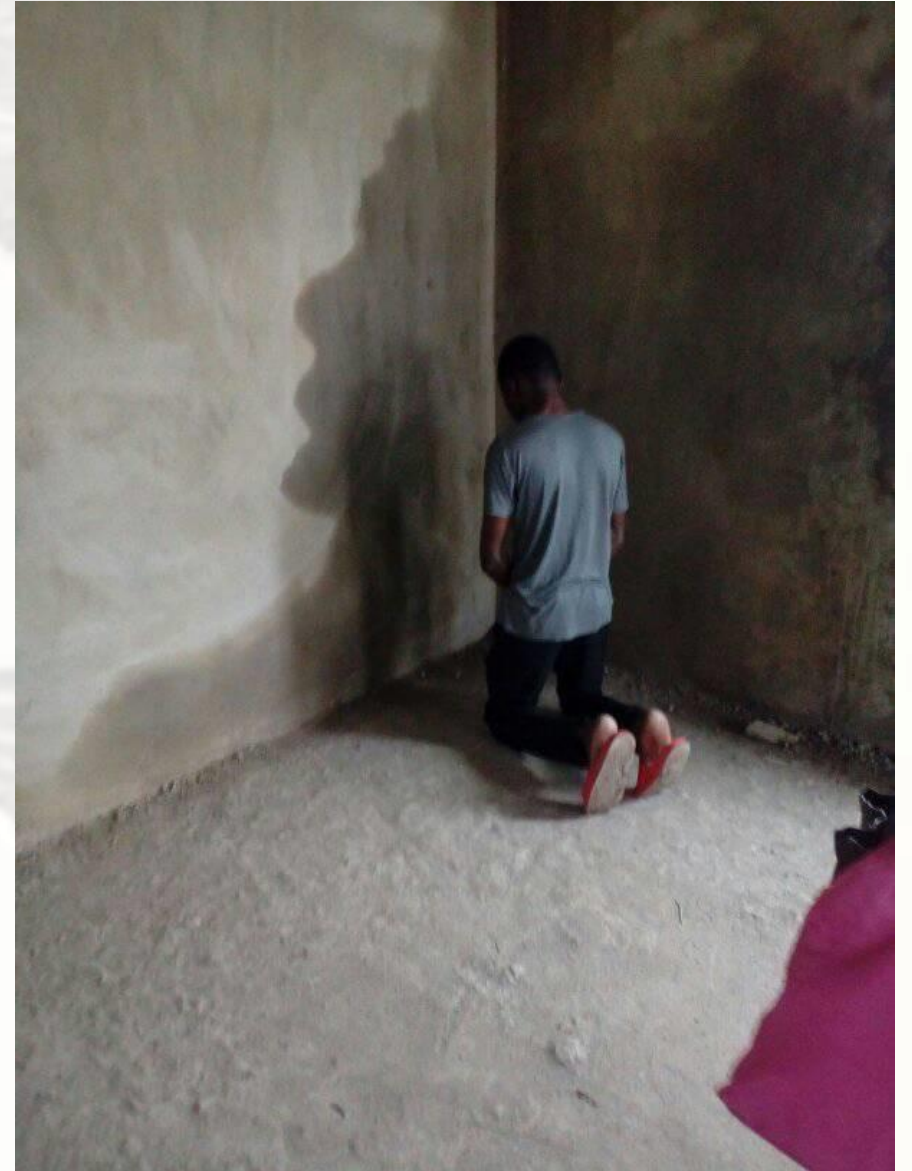
Table 5.1 Characteristics deemed most important to human mate choice by males and females

Rank	Ratings by males	Ratings by females
1	Mutual attraction–love	Mutual attraction–love
2	Dependable character	Dependable character
3	Emotional stability and maturity	Emotional stability and maturity
4	Pleasing disposition	Pleasing disposition
5	Good health	Education and intelligence
6	Education and intelligence	Sociability
7	Sociability	Good health
8	Desire for home and children	Desire for home and children
9	Refinement/neatness	Ambition and industrious
10	Good looks	Refinement/neatness
11	Ambition and industrious	Similar education
12	Good cook/housekeeper	Good financial prospects
13	Good financial prospects	Good looks
14	Similar education	Favourable social status
15	Favourable social status	Good cook/housekeeper
16	Chastity	Similar religious background
17	Similar religious background	Similar political background
18	Similar political background	Chastity

Based on Table 4 in Buss (1990).

Evoluční psychologie náboženství

- Jaké psychologické mechanismy produkují náboženské myšlení a chování?
- Jaké selektivní tlaky vytvořily tyto mechanismy?
- Jsou specificky vyvinuté pro náboženské myšlení a chování?





Religious thought and behaviour as by-products of brain function

Pascal Boyer

Departments of Anthropology and Psychology, Washington University in St Louis, MO 63130, St Louis, USA

Religious concepts activate various functionally distinct mental systems, present also in non-religious contexts, and 'tweak' the usual inferences of these systems. They deal with detection and representation of animacy and agency, social exchange, moral intuitions, precaution against natural hazards and understanding of misfortune. Each of these activates distinct neural resources or families of networks. What makes notions of supernatural agency intuitively plausible? This article reviews

made in the description of these different systems and their contribution to the 'naturalness' of religious beliefs.

A limited catalogue of the supernatural

Religious notions are products of the supernatural imagination. To some extent, they owe their salience (likelihood of activation) and transmission potential to features that they share with other supernatural concepts, such as found in dreams, fantasy, folktales and legends. This might be why one finds recurrent templates in

Standard CSR model (Jensen, 2009)

- Náboženské představy i rituální chování parazitují na standardní kognitivní architektuře (tj. nepotřebují vlastní specifický mechanismus jsou vedlejším produktem kombinace mechanismů určených primárně k jiným účelům)

- získávání nových znalostí o světě (P. Boyer)
- detekování jednatele
- koaliční psychologie
- „contagion-avoidance“
- ...

TOM (Theory of Mind)

„mentalizing“ „mind reading“

false believe task (Sally and Anne) (až od 4 let projdou)

HAD (Hyperactive agent detection)

tváře v mracích (S. Guthrie)

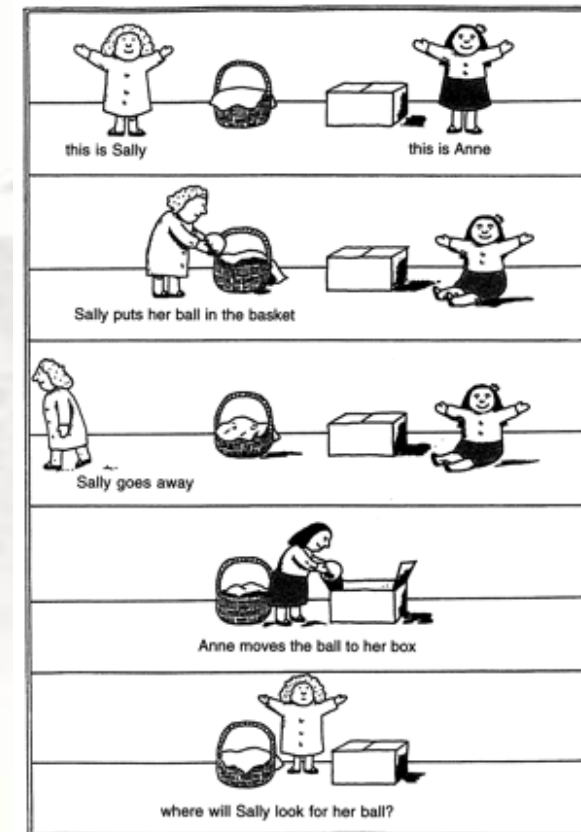
HUI (Hyperactive understanding of intentionality)

odhalování intencionality u artefaktů, událostí apod. i když chybí viditelný jednatel

HTR (Hyperactive teleofunctional reasoning)

připisování účelu objektům

D. Kelemen – děti jako intuitivní teisté



RESEARCH

Religious Cognition and Behaviour in Autism: The Role of Mentalizing

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ABSTRACT

Mentalizing, or theory of mind, has been argued to be critical for supporting religious beliefs and practices involving supernatural agents. As individuals with autism spectrum conditions have been found to have deficits in mentalizing, this raises the question as to how they may conceive of gods and behave in relation to gods. To examine this, we compared high-functioning individuals with autism spectrum conditions (HFA) to typically developing individuals across seven key aspects of religious cognition and behaviour: (a) strength of belief, (b) anthropomorphism of god concepts, (c) felt closeness toward the god, (d) prayer habits, (e) attraction to prayer, (f) efficacy of prayer, and (g) a sense of agency while praying. A battery of mentalizing tasks was administered to measure mentalizing ability, along with the Autism-Spectrum Quotient. As expected, typically developing subjects performed better than HFA subjects in the advanced mentalizing task. However, no statistically significant differences were found with first-order and second-order false belief tasks. In contrast to our predictions and previous research on the religiosity of HFA, we found very little differences between the groups in their religious cognition and behaviour. Moreover, the relationship between mentalizing ability and most of our measures of religious cognition and behaviour was weak and negative. Our data suggest that HFA's deficits in mentalizing appear to have only minimal impact on the way they interact and think about gods. We end the article by reevaluating the role mentalizing may have in religious cognition and behaviour.

who were matched across a number of key demographic variables. We predicted the following:

- (1) HFA will express lower strength of belief in the entity they primarily worship than TD.
- (2) HFA will be less likely to agree with anthropomorphic god traits than TD; however, there will be no difference in the extent to which they agree with nonanthropomorphic god traits.
- (3) HFA will have a reduced level of felt closeness toward the entity they primarily worship than TD.
- (4) HFA will perform more scripted prayers than TD and perform less unscripted prayer than TD.
- (5) HFA will like saying scripted prayers more than TD and perceive them as more important than TD.
- (6) TD will perceive their prayers as more efficacious than HFA.
- (7) HFA will be less likely to feel that their prayers are being listened to, that who they're praying to is present with them, and that prayer is similar to communicating with a person than TD.



Conclusion

In conclusion, we found only limited evidence of large differences between high-functioning individuals with ASC and TD individuals in how they conceive of gods and behave in relation to gods. TD did report statistically significant higher levels of attraction to prayer than HFA, but the differences between groups on our other measures of religious cognition and behaviour were small and not statistically significant. In terms of mentalizing, our results suggest that advanced mentalizing ability does not appear to have a large influence on religious cognition and behaviour. Our research, though, does not shed light on the role that more fundamental mentalizing skills have in conceptualising and interacting with gods, an exciting direction for future research.



A cognitive account of manipulative sympathetic magic

Ze Hong 

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ABSTRACT

Frazer's theory of sympathetic magic has been extremely influential in both anthropology and comparative religion, yet the manipulative aspect has not been adequately theorized. In this paper, I formalize sympathetic magical action and offer a naturalistic explanation of manipulative sympathetic magic by attributing it to a combination of environmental regularities (i.e., things that are similar and/or physically proximate tend to co-vary) and human causal cognition (i.e., the tendency to mistake correlation as causation), and supply ample ethnographic and historical evidence for my arguments. In doing so I also specify the variables involved and re-classify sympathetic magic into four distinct types for analytic convenience.

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Sympathetic magic; causal cognition; spatial autocorrelation; evolutionary psychology

Law of similarity: If two objects A and B are similar in their properties, then a change in A will cause a corresponding change in B.

Law of contagion: If two objects A and B were once in contact, then a change in A will cause a corresponding change in B, even if A and B are no longer in contact.

with their co-variation? As alluded to in the Introduction, I argue that (1) in the environment where humans live, objects that are physically closer and/or similar do tend to co-vary in their properties, and (2) humans have a strong tendency to detect patterns and establish causality and may mistake correlation as causation (Matute et al., 2015). Because $Cov(O_i^{change}, O_j^{change})$ correlates with both d_{ij}

In plain language, what I am suggesting above is that objects that are physically close or similar in their attributes are more likely to co-vary, and therefore people may believe that by making two things closer or similar they can induce such co-variation, and when people have control over one object, they may mistake correlation as causation again in thinking that manipulating this object will *cause* similar changes in the other object such that the co-variation is increased or maintained. Take the voodoo doll as an illustrative example; we may characterize the procedure as hav-

biology being a prime example (Atran, 1999). In the environment where humans live, it is often true that things that are of the same kind (1) change similarly in a temporal fashion (e.g., plant organisms grow with seasons) and (2) respond to external factors in similar ways (e.g., certain infectious disease would cause illness in similar types of animals, such as those of the same species, genus, or family). More generally, because the change induced by external factors on objects often heavily depends on the properties of these objects, those with similar properties would naturally respond in similar ways. Importantly, things of the same kind tend to occur in close proximity and resemble each other in properties. Our cognitive tendency to detect correlations and mistake them as causations, therefore, may pick up such environmental regularities and form the manipulative sympathetic magical intuitions over developmental time. Note that the formation of such a

Why ritualized behavior? Precaution Systems and action parsing in developmental, pathological and cultural rituals

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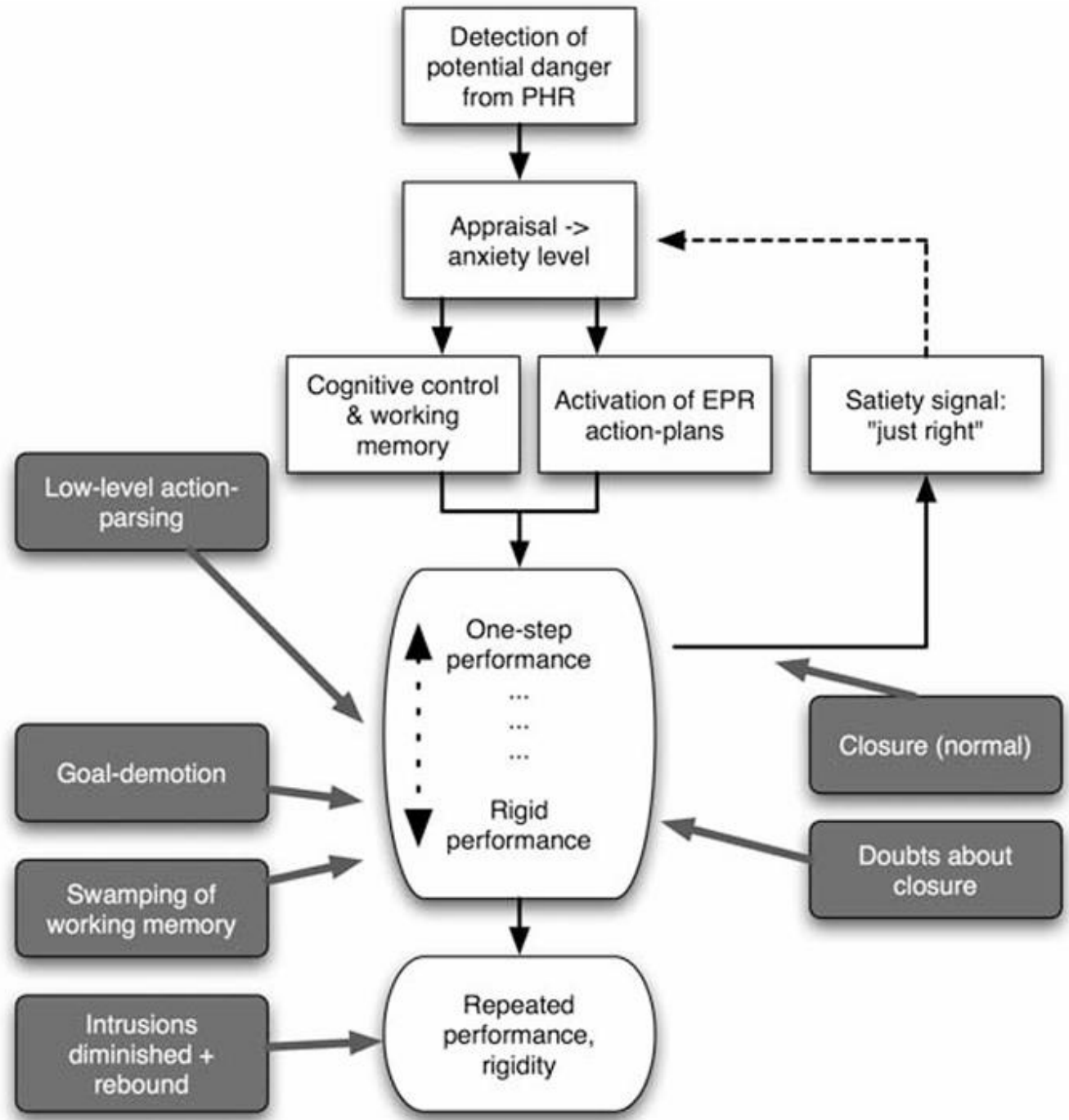
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Abstract: Ritualized behavior, intuitively recognizable by its stereotypy, rigidity, repetition, and apparent lack of rational motivation, is found in a variety of life conditions, customs, and everyday practices: in cultural rituals, whether religious or non-religious; in many children's complicated routines; in the pathology of obsessive-compulsive disorders (OCD); in normal adults around certain stages of the life-cycle, birthing in particular. Combining evidence from evolutionary anthropology, neuropsychology and neuroimaging, we propose an explanation of ritualized behavior in terms of an evolved Precaution System geared to the detection of and reaction





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Sync to link: Endorphin-mediated synchrony effects on cooperation



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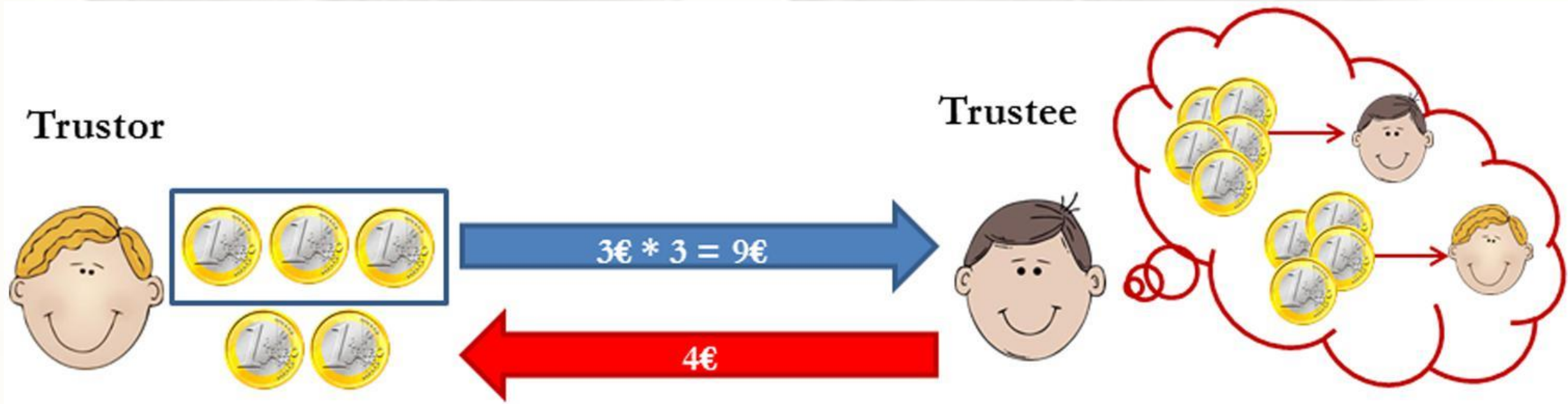
Self-other overlap

ABSTRACT

Behavioural synchronization has been shown to facilitate social bonding and cooperation but the mechanisms through which such effects are attained are poorly understood. In the current study, participants interacted with a pre-recorded confederate who exhibited different rates of synchrony, and we investigated three mechanisms for the effects of synchrony on likeability and trusting behaviour: self-other overlap, perceived cooperation, and opioid system activation measured via pain threshold. We show that engaging in highly synchronous behaviour activates all three mechanisms, and that these mechanisms mediate the effects of synchrony on liking and investment in a Trust Game. Specifically, self-other overlap and perceived cooperation mediated the effects of synchrony on interpersonal liking, while behavioural trust was mediated only by change in pain threshold. These results suggest that there are multiple compatible pathways through which synchrony influences social attitudes, but endogenous opioid system activation, such as β -endorphin release, might be important in facilitating economic cooperation.

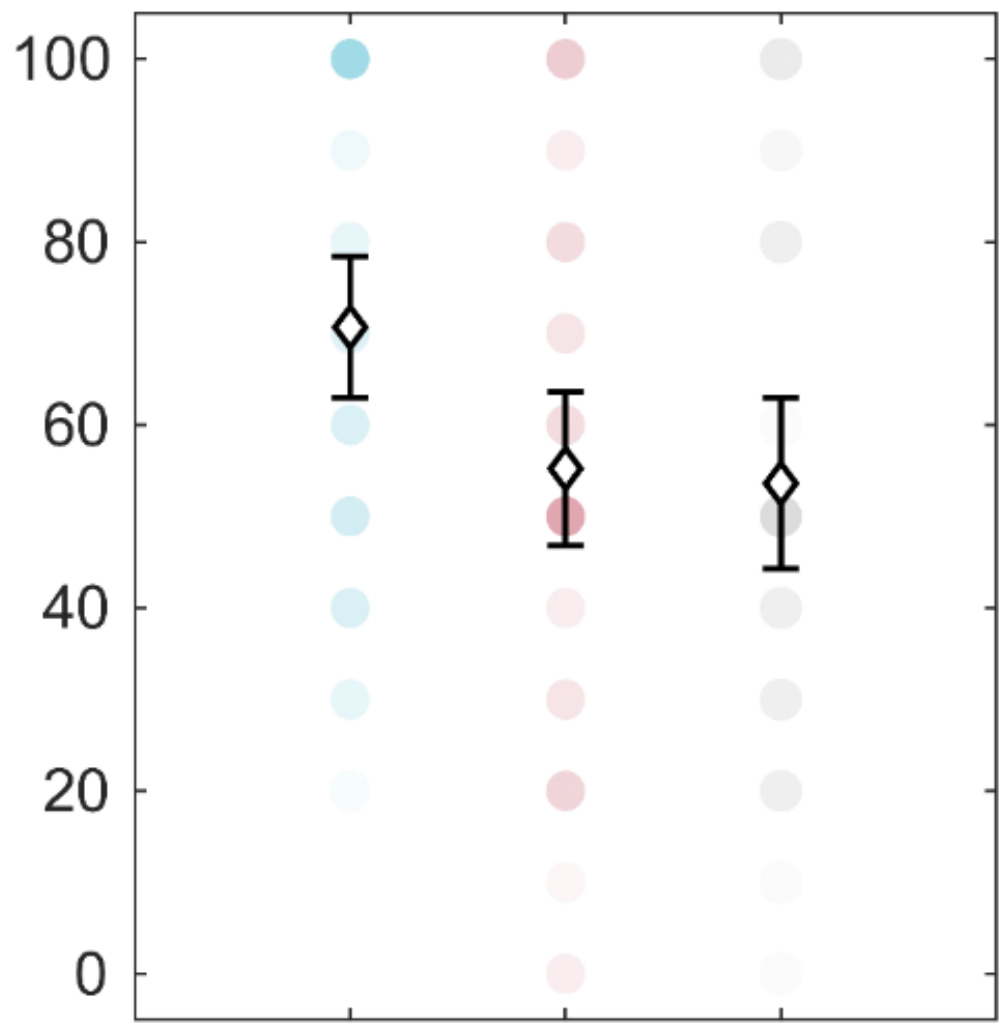




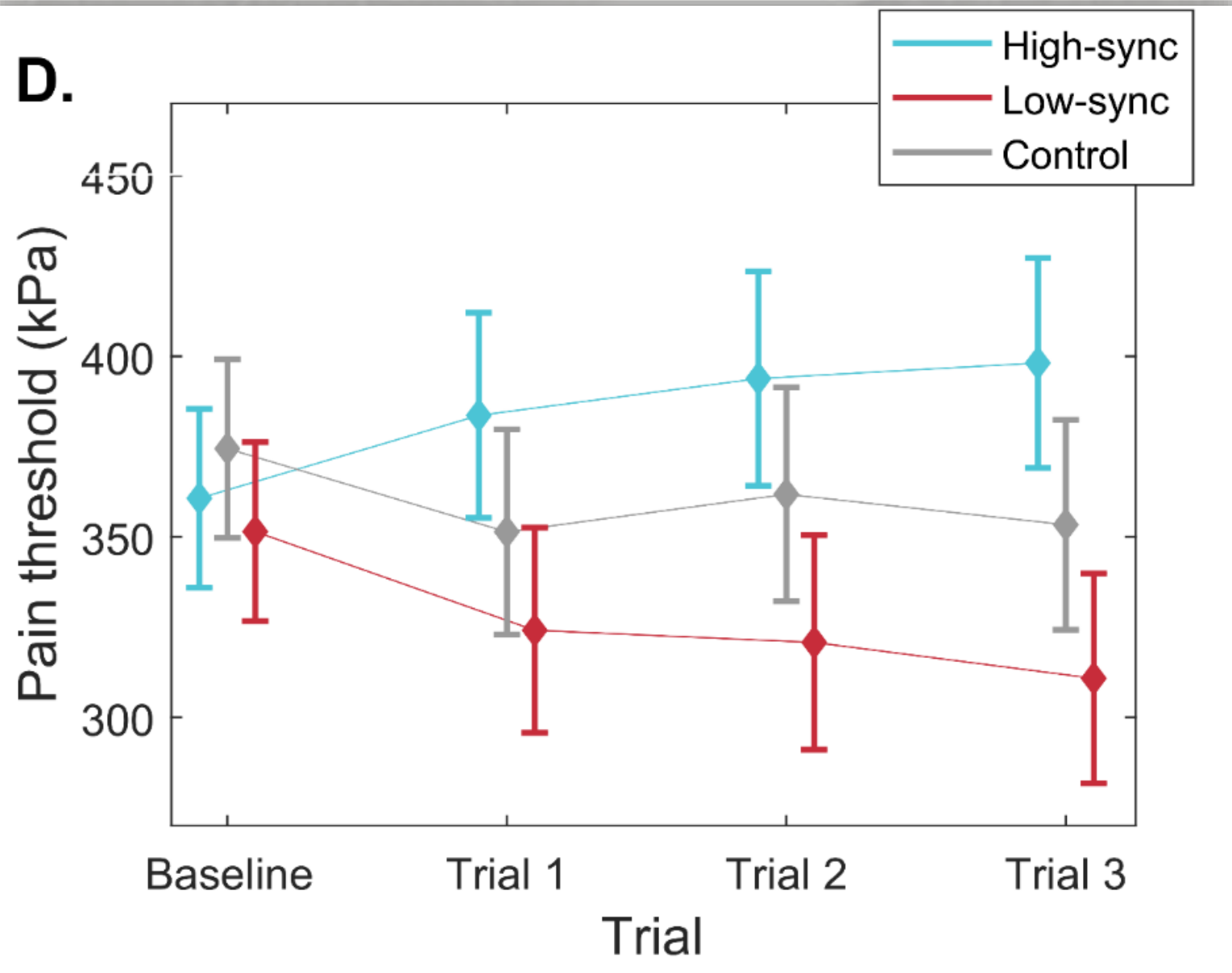


F.

Mean investment (CZK)

High-sync Low-sync Control
Condition

D.



D. Best fit model

