

TPO 30 – 1 Role of Play in Development 在发展中玩耍的作用

Play is easier to define with examples than with concepts. In any case, in animals it consists of leaping, running, climbing, throwing, wrestling, and other movements, either alone, with objects, or with other animals. Depending on the species, play may be primarily for social interaction, exercise, or exploration. One of the problems in **providing a clear definition of play** is that it involves the same behaviors that take place in other circumstances – dominance, predation, competition, and real fighting. Thus, whether play occurs or not depends on the intention of the animal, and intentions are not always clear from behavior alone.

问题 1: 询问 why (**providing a clear definition of play**);

用例证来定义玩耍要比用概念简单得多。在任何情况下,动物的玩耍都包括跳跃,奔跑,攀登,投掷,格斗和另外的一些动作,而玩耍既可以自己玩,也可以和物品或者其他动物。根据物种的不同,玩耍的目的主要包括社交,锻炼,或探索。定义“玩耍”的难点之一是,玩耍过程中常常包含一些与其它情况下相似的行为,例如支配,捕食,竞争和搏斗。因此,判断其是否玩耍,要根据动物的目的来确认,而常常通过行为本身很难确定其目的。

Play appears to be a developmental characteristic of animals with fairly sophisticated nervous systems, mainly birds and mammals. Play has been studied most extensively in primates and canids (dogs). Exactly **why animals play is still a matter debated in the research literature**, and the reasons may not be the same for every species that plays. Determining the functions of play is difficult because the functions may be long-term, with beneficial effects not showing up until the animal's adulthood.

问题 2: 询问 which presents a particular challenge 对于研究动物的 play 行为的研究者;

玩耍似乎是那些有着相对复杂的神经系统的动物,主要是鸟类和哺乳动物的一个发育,发展的特征。玩耍的大量研究主要在灵长类和犬类中进行。动物到底为什么要玩耍仍然在文献中存在争议,并且每种物种玩耍的原因也不尽相同。确定玩耍的功能很难,因为它的功能是长期的,伴随着一些直到动物成年才会显现出来的有利影响。

Play is not without **considerable** costs to the individual animal. Play is usually very active, involving movement in space and, at times, noisemaking. Therefore, it results in the loss of fuel or energy that might better be used for growth or for building up fat stores in a young animal. Another **potential cost of this activity** is greater exposure to predators since play is attention-getting behavior. Greater activity also increases the risk of injury in slipping or falling.

问题 3: 询问单词意思 (**considerable**);

问题 4: 询问哪一个 is cost to animals (engage in play);

玩耍对于动物个体并非没有一定的代价。玩耍通常是非常活跃的,包括一些动作,有时也会发出声音。所以,这些都会导致一些年幼的动物的本来可以用来生长或者储存脂肪的能量流失。另一个潜在的代价是玩耍增加了动物暴露给天敌的几率,因为玩耍是吸引注意的行为。大量的运动也会增加摔倒滑倒导致受伤的危险。

The benefits of play must outweigh the costs, or play would not have evolved, according to

Darwin's theory. Some of the potential benefits relate directly to the healthy **development of the brain** and nervous system. In one research study, two groups of young rats were raised under different conditions. One group developed in an "enriched" environment, which allowed the rats to interact with other rats, play with toys, and receive maze training. The other group lived in an "impoverished" environment in individual cages in a dimly lit room with little stimulation. At the end of the experiments, the results showed that the actual weight of the brains of the impoverished rats was less than that of those raised in the enriched environment (though they were fed the same diets). Other studies have shown that greater stimulation not only affects the size of the brain but also increases the number of connections between the nerve cells. Thus, active play may provide necessary stimulation to the growth of synaptic connections in the brain, especially the cerebellum, which is responsible for motor functioning and movements.

问题 5: 询问为什么作者提出 comment (though they were fed the same diets);

问题 6: 询问这一段支持哪一个陈述 (关于动物的 **brain**);

根据达尔文理论, 玩耍的好处一定超过其损失, 不然玩耍就不会得以进化。其中一些潜在的好处就是直接关于动物的大脑和神经系统的健康发展。在一项研究中, 两组小鼠被养在不同的环境中。第一组成长在一个比较“富裕”的环境中, 这样的环境使其可以与其他老鼠接触, 和玩具玩, 并且接受迷宫训练。另一组生活在“穷困”的环境中, 它们被养在独立笼子里, 只有微弱的光照和极少的刺激。最后, 结果表明生活在单一环境中的老鼠的大脑重量要比生活在复杂情况下的老鼠的大脑轻 (即使它们被喂养的食物一样的)。另外一些研究表明, 较大的刺激不仅会影响大脑的大小, 而且也会增加神经细胞间连接的数量。因此, 活跃的玩耍可以为大脑中的突触连接提供必要的刺激, 特别是负责运动机能的小脑。

Play also stimulates the development of the muscle tissues themselves and may provide the opportunity to practice those movements needed for survival. **Prey species**, like young deer or goats, for example, typically play by performing sudden flight movements and turns, whereas **predator species**, such as cats, practice stalking, pouncing, and biting.

问题 7: 询问为什么 play behavior might 不同的 (prey species & predator species);

玩耍也会刺激肌肉组织的生长, 并能提供练习生存技能的机会。被捕食者, 比如小鹿或者山羊, 其典型的玩耍动作就是突然快速跳跃和转弯, 相反捕食者, 比如猫科动物, 则练习潜行追踪, 猛扑和撕咬。

Play allows a **young animal** to explore its environment and practice skills in **comparative** safety since the surrounding **adults** generally do not expect the young to deal with threats or predators. Play can also provide practice in social behaviors needed for courtship and mating. **Learning appropriate social behaviors is especially important in species that live in groups, like young** monkeys that need to learn to control selfishness and aggression and to understand the give-and-take involved in social groups. They need to learn how to be dominant and submissive because each monkey might have to play either role in the future. Most of these things are learned in the long developmental periods that primates have, during which they engage in countless play experiences with their peers.

问题 8: 询问单词意思 (**comparative**);

问题 9: 等价替换语句 (Sentences = which of the CHOICES)

问题 10: 询问 **adults** 的角色 (在 **young** 的 **play activities** 中);

玩耍有助于幼年动物探索其生存环境, 并且由于周围的成年动物一般不期望幼子去处理威胁和捕食者, 所以它们可以在相对安全的环境中练习技能。玩耍也可以练习求爱和交配的社交行为。学习适当的社交行为特别重要, 尤其是对于群居动物, 比如猴子, 它们需要学会控制自己的自私和攻击性, 需要懂得群体生活需要的付出-回报规则。它们要学习怎么去统治和顺从因为每只猴子都会在将来扮演其中某个角色。大部分这类事情都在灵长类的长期的幼龄时期学习, 期间它们有数不清的与同伴玩耍的经验。

There is a danger, of course, that play may be misinterpreted or not recognized as play by others, **potentially** leading to aggression. 【】 This is especially true when play consists of practicing normal aggressive or predator behaviors. 【】 Thus, **many species have evolved clear signals to delineate playfulness**. 【】 Dogs, for example, will wag their tails, get down their front legs, and stick their behinds in the air to indicate "what follows is just for play." 【】

问题 11: 询问单词意思 (**potentially**);

问题 12: 询问为什么一些动物知道其他动物**仅仅在 play**;

问题 13: 插入语的位置 → 【】;

危险当然存在, 玩耍会被误解, 会不被认可, 潜在上导致攻击行为。当游戏含有攻击或捕食行为时, 尤其如此。因此, 很多物种已经演化出表达玩耍行为的明确信号。例如, 狗会摇摆尾巴, 放低前腿, 把臀部伸向空中, 表明“接下来的只是玩耍”。

TPO 30 – 2 The Pace of Evolutionary Change 进化变化的速度

A heated debate has enlivened recent studies of evolution. Darwin's original thesis, and the viewpoint supported by evolutionary gradualists, is that species change continuously but slowly and in small increments. Such changes are all but invisible over the short time scale of modern observations, and, it is argued, they are usually obscured by **innumerable** gaps in the imperfect fossil record. Gradualism, with its stress on the slow pace of change, is a comforting position, repeated over and over again in generations of textbooks. By the early twentieth century, the question about the rate of evolution had been answered in favor of **gradualism** to most biologists' satisfaction.

问题 1: 询问单词意思 (**innumerable**);

问题 2: 询问哪个不是真的; **【Except】**

最近的一个关于进化的研究引发了激烈的争论。达尔文的原始论点和进化渐进主义者支持的观点是物种会持续地改变,但非常缓慢,增量也很小。这种改变是普遍的,但是现在短时间的观察是不能察觉的,并且,这个观点声称,它们通常被掩盖于不完美的化石记录的不可计数的缺失中。渐进主义及其对物种缓慢变化的强调让人欣然接受,并在世代的教科书中重复出现。直到 20 世纪早期,大部分的生物学家满足于利用渐进主义来回答关于进化速率的问题。

Sometimes a closed question must be reopened as new evidence or new arguments based on old evidence come to light. In 1972 paleontologists Stephen Jay Gould and Niles Eldredge challenged conventional wisdom with an opposing viewpoint, the **punctuated equilibrium** hypothesis, which posits that species give rise to new species in relatively sudden bursts, without a lengthy transition period. These episodes of rapid evolution are separated by relatively long static spans during which a species may hardly change at all.

问题 3: 等价替换语句 (**Sentences = which of the CHOICES**)

问题 4: 询问假设之间的不同 (**gradualism**) & (**punctuated equilibrium hypothesis**);

有时,已经有了结论的问题必须由在已有证据基础上出现的新的证据和新的论点使其重新展开讨论。在 1972 年,古生物学者 Stephen Jay Gould 和 Niles Eldredge 用相反的论点挑战了世俗的结论,即断点平衡说,它假设了物种演变为新的物种是通过相对突然的爆发,并非通过长时间的过渡时期。迅速的进化期被时间相对更长的静态期分开,而在静态时期,物种是几乎完全不变的。

The punctuated equilibrium hypothesis attempts to explain a curious feature of the fossil record—one that has been familiar to paleontologists for more than a century but has usually been ignored. Many species appear to remain unchanged in the fossil record for millions of years—a situation that seems to be at odds with Darwin's model of continuous change. **Intermediate fossil forms**, predicted by gradualism, are typically **lacking**. In most localities a given species of clam or coral persists essentially unchanged throughout a thick formation of rock, only to be replaced suddenly by a new and different species.

问题 5: 询问一些物种的化石纪录中 (**Intermediate fossil forms, lacking**) 产生的影响;

断点平衡论试着去解释化石记录的一个古怪的特点----在超过一个世纪的时间里它已经为古生

物学者所熟悉，但一直被忽视。许多物种似乎在上百万年的化石记录中一直没有改变，这个情况与达尔文的模型所支持的物种的持续变化相悖。进化渐进论的支持者所预测的中间状态的化石一直没有出现。在大部分蛤和珊瑚的聚集地，其化石在很厚的岩石中都实际上没有变化，只是突然被另一新的并且不同的物种而取代。

The evolution of **North American horses**, which was once presented as a classic textbook example of gradual evolution, is now providing equally **compelling** evidence for punctuated equilibrium. A convincing 50-million-year sequence of modern horse ancestors—each slightly larger, with more complex teeth, a longer face, and a more prominent central toe—seemed to provide strong support for Darwin's contention that species evolve gradually. But close examination of those fossil deposits now reveals a somewhat different story. **Horses evolved** in discrete steps, each of which persisted almost unchanged for millions of years and was eventually replaced by a distinctive newer model. The four-toed Eohippus preceded the three-toed Miohippus, for example, but North American fossil evidence suggests a jerky, uneven transition between the two. If evolution had been a continuous, gradual process, one might expect that almost every fossil specimen would be slightly different from every other.

问题 6: 询问单词意思 (**compelling**);

问题 7: 询问北美的 horses change 的方式; **【Except】**

北美马的进化曾经被用作经典的教科书案例来证明渐变进化论，现在却为断点平衡学提供了同样有说服力的证据。一个有说服力的 5 千万年的马祖先的进化模型——每一代都稍稍大一点，有更复杂的牙齿，更长的脸，和中间更突出的脚趾——这一切都看似强有力的支持了达尔文的论点，物种是逐步地进化的。但是，对这些化石更严谨的验证现在揭示了一个不太一样的故事。马是在不连续的步骤中进化的，其中每个进化步骤中间都有上百万年时间保持不变，在最后被一个不同的更新的模型取代。比如四只脚趾的 Eohippus 在三只脚趾的 miohippus 之前，但北美化石证据表明在这之间有一个不平稳的，不均衡的转换过程。如果进化一直都是连续，渐进的过程，人们应该预期到的是每年的化石样本都会存在细微的差别。

If it seems difficult to conceive how major changes could occur rapidly, consider this: an **alteration** of a single gene in flies is enough to turn a normal fly with a single pair of wings into one that has two pairs of wings.

问题 8: 询问单词意思 (**alteration**);

如果很难设想大的改变会迅速发生，想想这些：一个单一基因的改变就足以将有正常有一对翅膀的苍蝇变成有两对翅膀的。

The question about the rate of evolution must now be turned around: does evolution ever proceed gradually, or does it always occur in short bursts? Detailed field studies of thick rock formations containing fossils provide the best potential tests of the competing theories. 关于进化速度的问题现在发生了转变：进化过程是逐渐发生的么，还是总是突然短时间的爆发？对含有化石的厚岩层的细致的现场调查可以检验这两个针锋相对的理论。

Occasionally, a sequence of fossil-rich layers of rock permits a comprehensive look at one type of organism over a long period of time. For example, **Peter Sheldon's studies of trilobites**,

a now extinct marine animal with a segmented body, offer a detailed glimpse into three million years of evolution in one marine environment. In that study, each of eight different trilobite species was observed to undergo a gradual change in the number of segments-typically an increase of one or two segments over the whole time interval. No significant discontinuities were observed, leading Sheldon to conclude that environmental conditions were quite stable during the period he examined.

问题 9: 询问 (Peter Sheldon's studies of trilobites) 证明了什么关于 (trilobites);

问题 10: 询问单词意思 (Occasionally);

问题 11: 询问 main purpose (整段);

偶尔,有一个系列的化石丰富的岩石可以允许人们综合性的观察一种生物在很长一段时间中的变化。比如, Peter Sheldon 对于三叶虫,一种已灭绝的身体分节的海洋生物的研究提供了其对三百万年来在同一海洋环境下进化的一些细节。研究中,八种三叶虫都观察到了其身体节数数量逐渐改变的过程,在整个时间段中,一般身体都增加了一到两节。没有明显的不连贯,这使 sheldon 得出结论:海洋环境在那段时间是比较稳定的。

【】 Similar exhaustive studies are required for many different kinds of organisms from many different periods. 【】 Most researchers expect to find that both modes of transition from one species to another are at work in evolution. 【】 Slow, continuous change may be the norm during periods of environmental stability, while rapid evolution of new species occurs during periods of environmental stress. 【】 But a lot more studies like Sheldon's are needed before we can say for sure.

问题 12: 插入语的位置 → 【】;

很多来自不同时期的不同的生物都需要开展相近研究。大多数研究者希望发现物种进化的这两种模式都存在。缓慢的,连续的变化可能是在环境稳定的时间段下的规律,而快速进化的新物种则发生在环境变化时期的压力下。但是,我们需要更多的像 Sheldon 所做的研究以证明这个观点。

TPO 30 – 3 The Invention of the Mechanical Clock 机械钟的发明

In Europe, before the introduction of the mechanical clock, people told time by sun (using, for example, shadow sticks or sun dials) and water clocks. Sun clocks worked, of course, only on clear days; water clocks misbehaved when the temperature fell toward freezing, to say nothing of long-run drift as the result of sedimentation and clogging. Both these devices worked well in sunny climates; but in northern Europe the sun may be hidden by clouds for weeks at a time, while temperatures vary not only seasonally but from day to night.

问题 1: 询问作者 why 提供信息 (in northern Europe...);

在欧洲, 在机械表被引入以前, 人们利用太阳 (比如棍子的影子和日晷) 和水钟来确定时间。当然, 太阳钟只能用于晴天使用, 而水钟表在水温下降到冰点时会出错, 更会因为沉积物或堵塞而长时间走偏。这两种仪器在晴天都运行的很好, 但北欧, 太阳可能会藏在云后长达一周, 而温度不仅会随季节中变化, 也因昼夜而不同。

Medieval Europe gave new importance to reliable time. The Catholic Church had its seven daily prayers, one of which was at night, requiring an alarm arrangement to waken monks before dawn. And then the new cities and towns, squeezed by their walls, had to know and order time in order to organize collective activity and ration space. They set a time to go to work, to open the market, to close the market, to leave work, and finally a time to put out fires and go to sleep. All this was compatible with older devices so long as there was only one authoritative timekeeper; but with urban growth and the multiplication of time signals, discrepancy brought discord and strife. Society needed a more dependable instrument of time measurement and found it in the mechanical clock.

问题 2: 询问哪一个不是 importance of timekeeping 的例子; 【Except】

问题 3: 询问为什么 Catholic Church 需要一个 (requiring an alarm arrangement);

问题 4: 询问单词意思 (authoritative);

中世纪的欧洲更需要可靠的时间。天主教堂每天有七次的祷告, 有一个是在晚上, 它要求设定闹钟以便在破晓前叫醒布道师。另外新的城市和小镇, 由于其空间的限制, 他们必须要知道并且安排时间去组织集体活动和分配空间。他们需要固定的时间上班, 开市, 关市, 回家, 最后熄火睡觉。如果只有一个权威的时间记录者, 老的仪器都可以满足上述需求。但是随着城市的发展和报时信号的倍增, 时间错乱导致了不和与争吵。社会需要一个更加可靠的工具去衡量时间, 这个仪器就是机械钟表。

We do not know who invented this machine, or where. It seems to have appeared in Italy and England (perhaps simultaneous invention) between 1275 and 1300. Once known, it spread rapidly, driving out water clocks but not solar dials, which were needed to check the new machines against the timekeeper of last resort. These early versions were rudimentary, inaccurate, and prone to breakdown.

问题 5: 询问作者使用 (the timekeeper of last resort) 代指 (?);

问题 6: 询问单词意思 (rudimentary);

我们并不知道是谁在哪里发明了这个机器。它好像是出现在意大利或是英国 (也许是同时发

明的) 在 1275 年到 1300 之间。一旦被人们所知, 它就快速传播并替代了水钟表, 但日晷依然存在, 用来对照这个新仪器与原来的计时法。早期的版本很原始, 不准确且易坏。

Ironically, **the new machine tended to undermine Catholic Church authority.** Although church ritual had sustained an interest in timekeeping throughout the centuries of urban collapse that followed the fall of Rome, church time was nature's time. 【】 Day and night were divided into the same number of parts, so that except at the equinoxes, day and night hours were unequal; and then of course the length of these hours varied with the seasons. 【】 But the mechanical clock kept equal hours, and this implied a new time reckoning. 【】 **The Catholic Church resisted,** not coming over to the new hours for about a century. 【】 From the start, however, the towns and cities took equal hours as their standard, and the public clocks **installed** in town halls and market squares became the very symbol of a new, secular municipal authority. Every town wanted one; conquerors seized them as especially precious spoils of war; tourists came to see and hear these machines the way they made pilgrimages to sacred relics.

问题 7: 询问 reaction (introduce of **mechanical clocks**);

问题 8: 询问单词意思 (**installed**);

问题 13: 插入语的位置 → 【】;

讽刺的是, 新仪器有破坏天主教堂权威性的倾向。虽然几世纪以来, 尽管城市瓦解, 罗马没落, 但教堂仪式一直保持着对时间记录的兴趣, 教堂时间是自然的时间。白天和黑夜被分为均等的部分, 所以除去春分秋分, 白天和黑夜时间是不均等的; 当然因此, 这些时间的长度也随着季节变化。但是, 机械时钟时间间隔相等, 这意味着新的时间计算法。天主教会进行反抗, 将近一个世纪都不肯转化到新的时间。但一开始, 城镇都接受了均等时间作为他们的标准, 并且安装公共的时钟在城镇大楼和市场变成了新的世俗市政权威的标志。每个城镇都想要一个; 胜利者视它们为珍贵的战利品, 游人专程去看并听这些钟表, 就像朝圣者去朝拜神圣古迹。

The **clock** was the greatest achievement of **medieval** mechanical ingenuity. Its general accuracy could be checked against easily observed phenomena, like the rising and setting of the sun. The result was relentless pressure to improve technique and design. At every stage, **clockmakers** led the way to accuracy and precision; they became masters of miniaturization, detectors and correctors of error, searchers for new and better. They were thus the **pioneers** of mechanical engineering and served as examples and teachers to other branches of engineering.

问题 9: 询问 (**medieval clockmakers**) 可以 infer (what) ?

问题 10: 询问关于 clock 的问题, 哪个被回答了;

问题 11: 询问单词意思 (**pioneers**);

钟表是中世纪机械精巧装置的最大成就。它的准确性可以通过简单地观察日出日落等常见现象来证明。这导致对技术和设计进步的残酷的压力。在每个阶段, 制表人引领着准确与精度, 他们成为了微型技艺的大师, 错误的探测者和校正者, 更新更好的探寻者。因此他们是机械工程的先驱, 是工程学其它分支的典范和老师。

The clock brought order and control, both collective and personal. Its public display and

private possession laid the basis for temporal autonomy: **people** could now coordinate comings and goings without dictation from above. The clock provided the punctuation marks for group activity, while enabling individuals to order their own work (and that of others) so as to enhance productivity. Indeed, the very notion of productivity is a by-product of the clock: once one can relate performance to uniform time units, work is never the same. One moves from the task-oriented time consciousness of the **peasant** (working one job after another, as time and light permit) and the time-filling busyness of the domestic servant (who always had something to do) to an effort to maximize product per unit of time.

问题 12: 询问 mechanical clocks 如何影响 **labor** 的；；

钟表带来了秩序和控制，既有集体的也有个人的。它的公开展示和私人拥有铺设了世俗自治的基础：人们现在可以不用根据上层的命令来调整去留。钟表也为集体活动提供了时间提示，同时使个人能够安排他们自己的工作，以加强生产力。事实上，生产力的准确概念是时钟的副产物，一旦一个人可以将其表现用统一的时间单位衡量，那么工作就永远都不会一样了。人们从农民以任务为导向的工作方式（在时间和光线条件允许的情况下，一件工作接着一件地干）和家奴以时间为导向的工作方式（总有事情做）转变为最大化单位时间产出的努力中。