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Self-control and child decision-making in sociocultural context

Abstract

Self-control is usually characterized as a skill in purely intra-individual terms, but recent scientific studies question this idea by clarifying how various contexts, both proximal and distal, can shape and contribute to explain the development of self-control, which, consequently, can be understood as a situated capacity, which is consistent with the theory of ecological rationality. The article argues on the social importance of self-control, points to neural correlates of this ability, and relates it to the idea of expected utility. After that, it refers to the influence of culture and consideration of context in the candy test and decision making. It concludes by discussing some implications of the topics reviewed for a more ecological perspective of self-control.

Keywords: self-control, children, decision-making, social context, culture

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Introduction

Self-control is an overly complex capacity that is associated with goal-directed behavior,[1] which requires the work of various regulatory skills associated with executive function, that would serve as the process of behavior governance. Executive function includes various processes, such as planning, motor control, inhibitory control, or impulse control. Three processes are considered main: flexible attention, working memory and inhibitory control.

Self-control, understood as the ability to regulate behavior directed towards goals, requires, among others, an essential skill: the ability to postpone rewards. One of the main paradigms with which this skill has been studied is with the well-known candy test, that consists of delivering a treat to a child, being that he must wait without eating it for 10 to 15 minutes to be able to receive a second treat. It has been seen that this task manages to capture quite well at an early age (4 to 6 years-old) the ability to regulate the behavior to avoid eating the treat and achieve the goal of obtaining two.

However, this ability does not depend only on intrapersonal processes. Several recent studies show that also the proximal and distal sociocultural context play relevant roles in the definition of motivations, self-regulatory capacity and decision making.[2–7] Proximal context means immediate influence and distal means a broader context. For example, regarding proximal context, House and Tomasello[7] showed that kids are more able to do costly sharing when they are primed to do this action with a social norm in terms of "the right thing to do". And regarding distal context, according to Uchida and colleagues,[32] societal dominant economic ways of subsistence shape values not only of those people directly involved in food production, but also in larger populations.

The more traditional view of self-control involves it with the children´s ability to guide their behavior by representing convenient goals in terms of gaining rewards. This vision is known as expected utility, which understands decision-making as a process always oriented by obtaining the greatest possible profit.[8] However, in another view called ecological rationality it is said that individuals make decisions restricted by the environments in which they operate, with which they must seek a certain level of fit to thrive.[9] This influence and need to fit to context is not considered in the view of rationality as an expected utility.

One of the contexts that strongly influence the way people in general and children in particular make decisions is culture, strongly linked to the first experiences of socialization and parenting,[3] which will be discussed later. But before that, other elements of self-control and decision making will be reviewed first.

Importance of self-control

The ability to postpone immediate gratifications to obtain greater and more sustainable ones later is a central skill in life, since almost any human project that can be imagined requires self-containment efforts first to reap greater achievements later. Likewise, learning needs immediate stimuli and impulses to be inhibited, in order to concentrate on tasks that require attention and sustained effort, which are often difficult goals to achieve for children and adolescents.

Although self-control is often seen as a product of the effort of individual executive function and rational capacity without proper consideration of the person's circumstances,[10] several recent research suggest that the contexts in which people live play a preponderant role in this capacity.[11,2,12,3]

In fast-paced modern times, full of immediate gratifications and offers of effortless "solutions," it is possible to argue that self-control is a difficult skill for many people to manage in various areas of their lives, such as: study, food, interpersonal relationships, work, money, or health. In the past, self-control decisions were attributed largely to individual capacity and utilitarian reasoning to make decisions.[8] However, recent sociocognitive research has been showing suggestive interactions between the environment and behavior, proposing more ecological visions to understand childhood cognition, emotions, decision-making and behavior, which could give new answers to old (and new) problems, and, consequently, point to novel approaches to research and intervention.[2,9,11]

According to some studies, self-control ability is associated with better achievements in life in adult life, such as income, personal relations, and health.[13] This makes sense with the idea that obtaining better results "tomorrow" requires self-control "today", as it is shown for example in the classic tale of the three little pigs and the wolf. This is clear in cases of saving, investment, study and maintaining long term relations.

Self-control and the brain

Self-control, associated with the postponement of rewards, is the ability to reject immediate temptations in the service of obtaining greater rewards later. One of the key elements in self-control is the ability to move the attentional focus away from temptations, which is associated with a strong functional coupling between the nucleus accumbens (a region of the brain that supports approach and avoidance behavior, like aversion and motivation) and the prefrontal and parietal cortex that support self-control.[1]

There is evidence that there are distinct brain systems for assessing immediate and deferred rewards. McClure[14] and colleagues found different areas of brain activation when evaluating immediate versus deferred rewards. Their results support the hypothesis that several areas of the brain that are associated with emotional responses are activated when immediate rewards are chosen, while greater activation of areas linked to rational processes is associated with postponed choice.

More specifically, McClure[14] and colleagues found that the parts of the limbic system associated with the midbrain dopamine system, including the paralymbic cortex, are preferentially activated in decisions involving immediately available rewards. Instead, the regions of the lateral prefrontal cortex and posterior parietal cortex are evenly hooked by the delayed options. These results suggest that while the most immediate rewards seem to have brain processing more linked to emotional systems, the most retarded have it with systems associated with reasoning. That is, the most automated and emotional response has to do with choosing the immediate stimuli, while the most controlled response has to do with regions associated with regulated behavior, planning and rationality.

This is associated with Kahneman´s systems 1 and 2, or automatic and controlled processes, which seem to suggest that the default response is to get the immediate reward unless there is cognitive effort to suppress it.[15]

Another main component of self-control is inhibitory control. Self-control can be seen as the ability to or desired actions, but when the focus is on the ability to resist an automatic response at any given time, then the topic refers more specifically to inhibitory control, which is the ability to inhibit irrelevant stimuli to achieve a higher goal. The integration of inhibitory control and the management of the attentional approach is part of what the executive function does, which coordinates various processes to orient behavior towards a desired end.[16]

Inhibitory control can be defined as the ability to suppress or hold impulsive or automatic responses and generate responses mediated by attention and reasoning. Self-control, on the other hand, is the ability to regulate emotions, thoughts, and behavior in the face of immediate temptations and impulses to keep goal-oriented behaviors. As part of executive function, self-control and inhibitory control are strenuous processes that are needed to regulate one's behavior to achieve specific goals, especially when those are not easy to achieve.

Infant self-control and expected utility

An important question to understand child self-control in contexts such as that of the candy test is: do children wait for the treat because they act guided by the expected utility or do other factors play a major role in the response? In several investigations[2–4] it has been seen that the behavior of children in the test of the treat would not only be influenced by their understanding of the advantage of waiting, but also by other factors, such as the reliability shown by the experimenter,[2] the socioeconomic status of the child[4] or the parenting style more focused on the need of the child or more focused on the needs of the social group.[3]

For example, in a study conducted in Costa Rica,[4] almost all preschool children in the sample managed to wait 12 minutes without eating the first treat, although it seems that those in the situation with an experimenter who gave previous evidence of reliability, managed to cope better with the task than those in an unreliable situation, where the experimenter showed evidence of poor reliability (he did not bring something he promised), which suggests that, in addition to the mere calculation of utility, children also weigh the reliability of their counterpart to decide whether or not to wait or to eat the first sweet. This was observed in that children in the most reliable situation lasted longer before touching the treat, touched it fewer times, and showed calmer behavior during the waiting time.

In addition, the study by Chaverri[4] and colleagues evaluated children of high and low socioeconomic status, finding a significant association between this context and the ability to postpone the prize. It was observed that those who have a more solvent position achieve a better waiting time than those who come from more lacking contexts, which show more difficulties in coping with the challenge of delaying the reward.

These results suggest that both proximal social factors (experimenter confidence) and distal social factors (socioeconomic background) play a relevant role in self-control, which would point in the direction of a more ecological understanding of behavioral self-regulation, as opposed to the more traditional solipsistic view of self-control, which sees it as a function of the individual's willpower without regard for particular interactions with the environment through the child's life experience (both immediate and chronic).

According to this evidence, expected utility should be better understood under the person´s context, because someone who decided not to postpone the immediate reward in an unreliable context is showing an ecologically rational behavior. This is, in a context of unstable socioeconomic conditions, it is more rational to keep one treat now that waiting for two latter. This ecological approach could be a better way to understand rationality, self-control efforts and decision making in contexts of poverty and unsafety. For example, when it is said that poor people are irrational because they prefer to buy a television instead of saving money for the future, this kind of assertion is not taking into account that for the poor person there is no guarantee that to save money will pay a better reward, in a context in which positive expectations and illusions are more frequently broken.

Influence of culture

Is the cultural context related to the decision to wait in the task of the treat? Does a more collectivist context reduce the agency or autonomy of the child in the face of the candy test? Does a more authoritative and less liberal parenting style promote a better performance in this test?

Aspects related to culture, such as: habits, customs, beliefs, norms, forms of upbringing and even social structures, have a direct and indirect influence on the way people make decisions. In the case of children's ability to delay rewards, a recent study by Lamm[3] and colleagues managed to show that preschool children from the rural Cameroonian Indigenous tribe Nso showed higher levels of waiting in the candy experiment, over their urban middle-class German counterparts, which showed less self-regulatory capacity.

To carry out this work, the research team analyzed the parenting styles of Cameroonian rural mothers and those of German urban mothers, finding that it is possible to differentiate them, since the former show an orientation towards hierarchical objectives

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of relational socialization and external control of children (more collectivist approach) , while the latter show a socialization focused on the autonomy of the child and sensitive parenting centered on the child (more individualistic approach). According to these authors,[3] this greater procrastination is related to the more directive and controlling type of parenting, based on obedience to the adults of the Cameroonian tribe, as opposed to the freer style and focused on individual needs and initiative, with which urban middle-class German kids are raised.

This could be related to the theory that people who are part of more collectivist cultures (such as Cameroonian) tend to show more conformist and less autonomous behavior in front of their social environment, compared to people from more individualistic cultures (such as the German one), who show a more independent and autonomous behavior.[17] These cultural aspects, in turn, have an effect on individual behavior, decision-making and the ability to postpone rewards from early childhood, as evidenced by the differentiated results obtained in the task of the treat, since rural Cameroonian children achieved much greater wait than urban German children.

These results point in the direction that one of the aspects that can influence self-control is culture, specifically through the parenting style that a person has lived, which constitutes a relevant aspect to understand the ability to inhibit impulses, since those who have been raised in more individualistic environments possibly feel more autonomous and agentive. Faced with the task of waiting for the candy test, while children raised in more collectivist environments probably feel less autonomous and more passive in the waiting process, it could not necessarily be because they have more self-control, but because it could happen that they feel a greater degree of external control that inhibits their behavior from the outside. This could imply that, depending on sociocultural context, what is called self-control in western large-scale societies, could be meaning a more social or external control in some rural indigenous small-scale societies, like the case of Nso people.

A child raised with a more collectivist style is learning that before their needs are those of the social group, which implies learning to postpone individual rewards and desires depending on the social context. On the other hand, a child raised with a more individualistic style is accustomed to having his needs met before those of others, which involves learning to immediately satisfy individual desires.

The candy test and trust: contextualizing the interpretation

One of the problems in the first studies with the candy test in the decades of the sixties and seventies of the twentieth century,[18] is that their samples were based on children who attended the preschool of Stanford University in the United States, which correspond to a population of high socioeconomic status that, in no way, can be considered representative of the entire population of this country, much less of the world.

What does the candy test reveal, when contextualized, about the way decisions are made? When children are shown evidence before taking the candy test that they may or may not trust their counterpart, it can be observed that those who are previously disappointed perform lower in this task compared to those who are not disappointed, which suggests that trust in other people plays a very important role in making decisions and accompanying efforts to postpone rewards,[2] which is not taken into account in the standard economic theory of decision-making, where the person is seen as a mere calculator and profit maximizer.

From their experience collaborating in children's shelters where kids do not have a stable environment, Kidd[2] and colleagues wondered to what extent such an environment influences the capacity for self-control and behavioral decision-making of children. To answer this question, they designed an experiment in which they contextualized the candy test, so that before performing it they asked the children to make a drawing, then they proposed to do it either with some materials in poor condition or with others wider, assorted and in good condition. The vast majority of children chose the improved materials, and at this moment the fulfillment or non-fulfillment of the promise to bring such materials was randomized, to see the role of trust in the task of the treat.[2]

This experiment showed that those who saw the promise of receiving improved materials fulfilled achieved a better result in the candy test than those who had this expectation broken.[2] In addition, in a replica of this study conducted in Costa Rica,[4] an equivalent result was also found, since those who were fulfilled the previous promise of receiving improved materials, also obtained a better performance in the task of the treat. On the other hand, this study also compared the performance of children of high and low socioeconomic status, obtaining that those who came from low stratum achieved a lower performance in this task of postponement of reward. Interestingly, this performance did not show a significant relationship with being in a public (no payment required) or private (high payment required) educational center.[4] This effect may be due to the fact that a few families from the public school showed a better socioeconomic condition. Apparently, the broader socioeconomic context (and not the type of school: public or private) is the one having a more systematic effect on the performance of the children participating in the study.

In other words, these studies in two different sociocultural contexts managed to find that children who were under the condition of trust, could wait longer than those who were under the condition of non-trust, raising this the possibility that, contrary to what was believed in the past,[18] the ability to postpone rewards is not necessarily an aspect that depends only on the individual; but rather, it may vary depending on the characteristics of the environment (socioeconomic status) and the particular interaction between the social environment (trust versus non-trust condition) and the individual (and his background living conditions).

Additionally, Chaverri[4] and colleagues found that those children who managed to wait longer before touching the treat, touched it less times in total than those who waited less time, suggesting that waiting became less difficult (and not only longer). The analyses derived from this research show that the contextual conditions and the immediate environment where children developed the task of the treat have an influence on their decision-making processes. One interpretive possibility is that this study reflects how the participating children establish a relationship between the value of the reward and the chances they have of obtaining it, based on their immediate context, as well as their previous experience.

In this line, part of the results obtained after the application of the candy test experiment in the Costa Rican context[4] show that the confidence that participants may have in counterparts can have a considerable effect on the postponement of the reward. This research finding could find agreement with the theory of bounded rationality,[19] which shows that decision-making processes are influenced by the cognitive limitations of the decision-making agent, present in elements such as beliefs, the amount of information that each person is able to possess and process, and even the level of certainty about the consequences of a given action, such as trusting another person's word after they have given evidence that they are or are not trustworthy.

Additionally, the understanding of the influence of context on the resulting decision could be complemented with the theory of

ecological rationality, since in this approach it could be said that the sense of rationality changes according to the environment and in this case it could be interpreted that the response of children to touch or eat the sweet faster in the absence of credibility of their counterpart is an ecologically sound action, as it fits better into the particular circumstances in which the decision-maker finds himself. It seems that here, kids apply a heuristic based on a principle such as: "it is better one candy in hand now than two flying", or something like: "if this person lied to me telling that he was going to bring me some improved drawing materials, how can I be sure that he will bring me the second sweet promised?" While in expected utility rational theory the rule would say that two is more than one and therefore worth striving and waiting, ecological theory would posit that this context makes the expected utility unviable, and it is better to take advantage of what is already in the face of an unsafe promise.[9]

Circumstances of trust or lack thereof can lead the agent to wonder if it is worth trusting when he has been defrauded before, and if it makes sense to exert effort and have patience when he has received evidence of non-credibility previously. Thus, one might think that the child who eats the treat before the experimenter returns when he has been disappointed by it before, is acting irrationally regarding the fact that two treats are more than one, but rationally based on the fact that his confidence has just been disappointed. It could be said that the ecological approach is strategic in that it considers the specific restrictions of the context for the actor, leading him to act in correspondence, which points to self-control and decision making as a situated behavior. The innovation of the ecological theory of decision-making would be that it could contribute fruitfully to explain the way in which human-environment interactions influence human behavior.

This line of research, as well as the ecological theory, suggest that the contextual conditions where human beings develop and in this specific case, preschool children, powerfully influence the decision-making processes that they deploy. This vision of contemplating the influence of context on behavior in a dynamic (non-deterministic) way has also been developed by other theoretical models that are being applied with good results, such as situated[35] cognition, the historical-cultural approach,[7] the evolutionary approach,[20] the epigenetic approach[21] and the social neuroscience approach.[22] In future research it could be fruitful to develop interdisciplinary designs of investigation that integrate these different perspectives under a more ecological view of human behavior and development.[23–34]

Conclusion

The international evidence reviewed in this paper points to the direction that in the individual performance of self-control, contextual forces play a relevant and complex role, suggesting that an understanding of self-control in purely intrapersonal and strictly individual terms, without taking the context into account, could be biased with respect to the fact that human beings are sociocultural and ecological beings who are involved in contexts of different levels and characteristics, which shape individual features.

At various levels, the proximal and distal elements seem to play a crucial role in self-control and decision making. Regarding the proximal factors, such as interpersonal trust and immediate evidence of predictability and safety, they influence expectations and confidence to exert an effort. Regarding the distal factors, the broader socioeconomic context of the person, which determines the resources, services, opportunities, and attention that can (or cannot) be received, also have an impact on self-regulatory capacities. It seems that, for children located in lacking unstable and risky socioeconomic contexts, expectations of future rewards are not a credible representation, which impairs their capacity for sustained and effortful self-control.

Similarly, culture also shows a crucial role, particularly through parenting styles, which can be distinguished between those more centered on the child and his individual needs, and those more centered on the social group and its needs. Here it has been showed that these styles have a differential impact on self-control, not only in its results, but also in how the situation of the candy test is approached by the child, because under highly individualistic parenting children show reduced capacity to wait, maybe accustomed to see their needs immediately meet; whereas under highly colectivistc parenting children show higher conformity to norms and probably see the waiting time not as a free option to choose but as a order to be obeyed, even under no awareness of direct supervision.

As a whole, the interpersonal, socioeconomic, and cultural factors reviewed make a reminder that the human being is not isolated from his environment, and that even the understanding of the individual capacity for self-control should consider that "I am myself and my circumstances",[27] which means that to fully understand human development and behavior, both person and context cannot be dissociated.

On another hand, the research reviewed here may serve to profoundly question the notion of individual "free will", on which much of the Western legal frameworks are based, because if the factors surrounding the person (both distal and proximal) have an strong influence in important ways and outside the conscious management from the individual, then this implies that such factors must be considered in light of research evidence, to ponder the powerful and sometimes neglected impact of the ecosystem, both cultural and physical, in which each person is situated.

Maybe one of the implications of considering the context in evaluating individual self-control could be to abandon the tendency of analyzing free will in absolute terms of all or nothing and advancing to a more cautious, nuased and multilayered approach, in which the evaluation of the diverse factors of the ecosystem are pondered both one by one and in relation with individual factors, to have a better understanding of human decision making and self-control capacity.

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Conflicts of interest

The author declares there is no conflict of interest.

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