

Anchoring in Adolescent Decision Making: A Literature Review and Applications

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Abstract

Understanding cognitive processes and judgment and decision-making mechanisms—especially potential cognitive biases—is crucial for effective development and learning for adolescents, particularly in the realm of Decision Education. Anchoring, a pervasive cognitive bias that simplifies problems and reduces complexity, has been shown by research to significantly influence decision-making processes and lead to systematic errors among adolescents. This comprehensive review summarizes and delves into the psychological processes underlying anchoring, individual differences affecting susceptibility, and factors influencing its effects. Practical applications in negotiation and purchasing decisions are discussed, highlighting the important implications of understanding and mitigating anchoring biases in Decision Education. I conclude by proposing crucial interventions and pedagogical exercises for adolescents to counteract anchoring effects, for example, in negotiations and consumer contexts, emphasizing critical thinking, seeking diverse perspectives, and strategies of “considering the opposite”. This holistic perspective of anchoring bias can ultimately educate and empower adolescents to make informed decisions, thereby fostering lifelong success in everyday decision-making.

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Understanding cognitive processes and judgment and decision-making mechanisms, especially potential cognitive biases, is crucial for effective development and learning for adolescents, especially in the realm of Decision Education. Heuristics, extensively studied over the past 50 years, play a significant role in shaping how individuals process information. Tversky and Kahneman (1974) found that people often employ heuristics, in particular *anchoring*, to simplify problems and reduce complexity. This simplification, however, may lead to systematic errors, and it is imperative to explore the implications of such cognitive shortcuts in adolescents. Anchoring, a widely researched heuristic and cognitive bias, holds robust effects on decision-making and has applications in negotiation and daily purchasing (Cervone & Peake, 1986), areas that are pertinent to adolescents' developing cognitive skills. This paper aims to delve into the literature surrounding anchoring effects and heuristics in human judgment and decision-making, considering their implications for adolescent learners. Further, the analysis will explore factors influencing anchoring, such as cognitive ability, knowledge, mood, and personality, within the context of adolescent development. Finally, the paper will address how the existing findings are crucial for enhancing Decision Education—"the teaching and learning of skillful judgment formation and decision-making" (Alliance for Decision Education, 2023, p. 11)—and also the practical applications of anchoring, particularly in daily scenarios frequently encountered by adolescents, including negotiations in educational settings and consumer purchasing.

The Underlying Process of Anchoring in Adolescence

Prior studies highlight that adolescents, in their developmental journey of puberty (Blakemore et al., 2010), showcase instances of irrational decision-making (Albert & Steinberg, 2011; Banai & Yifat, 2011). Following Tversky and Kahneman's (1974) insights, adolescents

often resort to heuristic principles as a coping mechanism to simplify the intricate task of assessing probabilities and predicting values. While these cognitive shortcuts prove beneficial in managing cognitive load and time constraints, they also exhibit a susceptibility to errors.

Anchoring, a prominent bias in adolescent decision-making, involves judgments being swayed by initial information. Scholars have characterized anchoring as the assimilation of a numeric estimate to a previously provided standard (Mussweiler & Strack, 1999). The prevalent theory elucidating the psychological processes underlying anchoring is the Selective Accessibility Model by Mussweiler and Strack (1999), which can be applied in the adolescent context (e.g., Scully et al., 2023). According to this model, adolescents can compare the anchor value with the target to explore the possibility of equality. This comparison prompts the retrieval of selective knowledge from memory, consistent with the target assumption. Consequently, the accessibility of anchor-consistent knowledge increases, leading adolescents to predominantly rely on easily accessible information consistent with the previously generated anchor value (Mussweiler et al., 2000). In essence, the anchoring effect during adolescence transpires due to anchor-consistent semantic knowledge easily accessible to the adolescent at the moment of decision-making (Klaczynski, 2001).

Primary Factors Influencing Anchoring Effects in Adolescents

The primary factors influencing anchoring in adolescents revolve around the accessibility of information, its applicability, and representativeness (Strough et al., 2011). In situations where there's no clear systematic approach, adolescents tend to rely on readily available information. The less familiar adolescents are with a particular subject, the more likely they are to embrace the anchor value in their judgment. Conversely, when adolescents possess prior knowledge of a topic, they assess the anchor value's compatibility with their existing data. Subsequently, they

either accept or dismiss the value in their judgment (Strack, 1992).

Representativeness holds significance in the adolescent decision-making process. If the anchor value fails to align with what adolescents perceive as representative, it is either excluded or contrasted in their mental model (Schwarz & Bless, 2013). Higgins and colleagues (1977) assert that, for a value to become part of the adolescent mental model, the anchor must be applicable or relevant to the judgment at hand; otherwise, it is disregarded. However, other researchers challenge this notion by demonstrating that arbitrary values strongly influence adolescent judgment (Ariely et al., 2003). In some experiments, individuals were asked if they would buy a product for a dollar figure equal to the last two digits of their social security number. Subsequently, they stated their maximum willingness to pay (WTP) for the item. The findings revealed that the maximum WTP of adolescents was indeed influenced by this arbitrary value, challenging the idea that applicability is the sole determinant of anchoring effects in adolescence (e.g., Albert & Steinberg, 2011).

Individual Differences of Anchoring Phenomenon Among Adolescents

Differences in individual characteristics among adolescents play a crucial role in influencing the anchoring phenomenon. Similar to adults, adolescents' moods have been shown to impact the anchoring effect on judgment. Research suggests that adolescents experiencing sadness tend to be more susceptible to anchoring bias compared to their happier counterparts (Albert & Steinberg, 2011; Bodenhausen et al., 2000). Moreover, personality traits contribute significantly to the anchoring effect in adolescents. Those with high conscientiousness and agreeableness, coupled with low extraversion, show a greater inclination towards anchoring bias. Conversely, adolescents who seek challenges exhibit a lesser degree of susceptibility to anchoring (Klaczynski, & Felmban, 2014; Eroglu & Croxton, 2010).

Cognitive ability is another factor shaping the anchoring effect in adolescents (Strough et al., 2011). While Oechssler et al. (2009) found that cognitive ability did not diminish the anchoring effect, predominant studies indicate that as the cognitive ability of adolescent judges increases, the impact of anchoring tends to decrease, presenting a different perspective (Bergman et al., 2010; Strough et al., 2011). The discrepancy in findings could be attributed to methodological differences, such as Oechssler et al. (2009) using CRT to measure intelligence while others utilized a CAT measure, known for its comprehensiveness. Relatedly, expertise level also plays a role in how anchoring affects adolescent judgment (Albert & Steinberg, 2011). In a study conducted by Northcraft and Neale (1987), where estate agents estimated the appraisal value of a house, experts were found to be susceptible to the anchoring effect. However, their susceptibility was less pronounced compared to uninformed judges, highlighting the potential influence of expertise on the impact of anchoring in adolescent contexts, as found in studies involving accounting and medical students (Bornstein et al., 1999; Tan & Yates, 1995).

The Importance of Understanding Anchoring Effect in Decision Education

The extant research reviewed thus far suggests that adolescents are subject to anchoring when making everyday decisions based on several essential factors. These insights are important to understand how Decision Education, referring to “the teaching and learning of skillful judgment formation and decision-making” (Alliance for Decision Education, 2023, p. 11), can assist adolescents in improving decision-making knowledge and competence, thereby leading to better outcomes. Specifically, the exploration of various cognitive factors and individual differences covered in the current paper that can amplify this potential bias helps understand *benchmarks for students’ decision-making knowledge, skills, and dispositions*. This answers the important question of “What individual factors such as cognitive ability, personality, or decision

style are associated with decision-making?” particularly regarding decision makers and relevant context as well as situational factors.

In doing so, we can achieve a comprehensive understanding of anchoring, which is vital for developing educational interventions aimed at addressing adolescents’ susceptibility to such prevalent cognitive bias in decision-making. Representing a crucial step in enhancing one’s cognitive resilience and decision-making capabilities, this aligns with the imperative to *conduct effective interventions on Decision Education* (Alliance for Decision Education, 2023). For example, to counteract anchoring effect and empower adolescents to make more informed decisions, educational modules focusing on cognitive biases of anchoring can be developed. These modules should offer a comprehensive understanding of the psychological mechanisms underlying anchoring and employ real-life examples and interactive activities to engage students in critical thinking about how biases shape their decision-making processes (Morewedge et al., 2015).

In practice, these efforts should also involve educators and teachers in K–12 learning domains, with the goal of providing students and adolescents with better training to maximize decision-making quality. Real-world practices can include integrating critical thinking exercises into the educational curriculum on decision-making in an effort to help students and adolescents develop the skills necessary to recognize and challenge anchoring biases in various contexts. By presenting scenarios where anchoring may occur, such as negotiation and daily purchasing (as discussed in detail in the following sections), educators can encourage students to critically analyze information in these commonplace scenarios. They can also facilitate discussions that promote a deeper understanding of the potential consequences of anchoring on decision outcomes. Through these exercises, adolescents can learn to approach problems with a more

open and analytical mindset, reducing their reliance on cognitive shortcuts, especially anchoring. Moreover, when making decisions, adolescent learners and students can learn to proactively resist and more rationally counteract the anchoring effect by employing specific strategies, including “considering the opposite” (Adame, 2016; Mussweiler et al., 2000). Such intervention for mitigating bias involves generating logical reasons why an anchor is rather inappropriate in making estimates during decision-making. Implementing these strategies within the framework of Decision Education can significantly contribute to improving adolescents’ decision-making abilities and fostering a more robust approach to dissecting and overcoming cognitive biases.

Application of Anchoring in Adolescent Negotiations

As noted above, here I illustrate potential scenarios where anchoring can arise and some relevant key takeaways and practical implications for Decision Education. Anchoring plays a crucial role in various fields, including business, with one of its primary applications being a bargaining tactic. In a study conducted by Galinsky and Mussweiler (2001), it was found that whoever initiates the first offer in a negotiation gains a bargaining advantage, often leading to a better outcome. Adolescents, like adults, face uncertainties in negotiations due to a lack of information about opponents, especially regarding reservation and target points. Consequently, in simplifying decisions during negotiations, adolescents tend to rely on heuristics, making anchoring a useful strategy to guide judgments toward desired outcomes (Selman et al., 1986).

Even when not explicitly used, anchoring still significantly influences negotiation outcomes. Considering salary negotiations as an analogy (Bazerman, 2002), discussions about grades or academic achievements may become anchored by previous assessments or expectations, affecting the final outcome. For instance, just as current salaries serve as anchors in job negotiations (Bazerman, 2002), past grades may influence the perceived value of a student’s

academic performance. Similarly, the initiation of discussions about grades might lead to varied reactions, much like the negative responses candidates may face when negotiating salaries (Major et al., 1984). However, introducing humor (Thorsteinson, 2011), perhaps by verbally humorously proposing an extreme grade, can create an anchoring effect in academic discussions, influencing how grades are perceived and negotiated.

The other negotiation context relevant for adolescents is student team projects. Within the dynamic of idea generation and conflict resolution, the initial proposal or idea often operates as a pivotal anchor, significantly influencing the trajectory of collaborative efforts within the group (Girotra et al., 2010). To effectively navigate and mitigate the anchoring bias inherent in negotiations during student team projects, adolescents should consider various factors. This includes thoughtful consideration of the opponent's Best Alternative to a Negotiated Agreement (BATNA), the opponent's reservation price, and establishing their own negotiation targets. This strategic approach aims to eliminate the undue influence of the anchor (Galinsky & Mussweiler, 2001). An additional effective strategy involves acquiring in-depth knowledge and information about the subject under negotiation; for example, this may include understanding why and how conflicts arise, as well as identifying the benefits and downsides of team conflicts in student projects in schools. This proactive step serves to diminish the anchor value's impact on the negotiator's judgment. Moreover, encouraging adolescents to articulate reasons why the anchor may be inappropriate becomes a valuable strategy, further diminishing the anchoring effect and providing decision-makers with more recent and accessible information for their judgments (Mussweiler et al., 2000).

Additionally, the representativity of the proposed value assumes particular significance when dealing with conflicts related to resource allocation or task assignments in the realm of

student team project negotiations. For instance, if a team member suggests an extremely low value for the importance of a particular task or resource, it may create a contrasting effect within the team. This extreme proposition might be perceived as a lack of seriousness or commitment by other team members. In response, these team members could counteroffer with excessively low assessments or contributions, creating a cycle of negotiations anchored by these initial extreme values (e.g., Mussweiler & Strack, 1997). In this way, the dynamics of conflict resolution and resource allocation within the student team project negotiations—important in adolescent education, learning, and decision making—are intricately tied to the effective awareness and management of anchors.

I discuss some important interventions or pedagogical exercises that can help in adolescents' negotiation context, in line with Alliance for Decision Education's (2023) key research areas, to support Decision Education. For instance, practical negotiation simulations offer a valuable opportunity for adolescents to apply their knowledge of anchoring biases in a controlled environment. By simulating negotiation scenarios related to adolescents, such as academic discussions or team projects, students can practice recognizing and counteracting anchoring biases firsthand. Feedback and debriefing sessions following these simulations can further reinforce the importance of deliberative thinking, considering alternative perspectives, and avoiding cognitive shortcuts such as anchoring in decision-making processes.

Application of Anchoring in Adolescent Consumers: Daily Purchasing Decisions

Anchoring also plays a crucial role when adolescents make daily decisions regarding purchases of goods and services, particularly in the context of reference pricing (Moschis & Churchill, 1979). This marketing and economic term refers to any price, whether internal or external to memory, against which other prices are evaluated (Biswas & Blair, 1991). Adolescent

consumers use the reference price to assess external reference prices or savings claims, influencing their purchasing decisions (Biswas et al., 1993). In simpler terms, external reference prices act as anchors, and adolescents then determine whether these values align with the information available to them (internal reference price). If adolescents lack past information about a product, they are likely to rely more on the anchor value (external reference price), potentially leading them to spend more money or exhibit bias towards a specific product.

Additionally, individuals have a Latitude of Price Acceptance (LPA), representing a range or point containing the reference price where they display price sensitivity. If the product's price exceeds these bounds, adolescents may opt not to purchase the product or service (Kalyanaram & Little, 1994). Furthermore, according to Mazumdar et al. (2005), a reference price for a particular product is shaped by adolescents' expectations of the future price based on their past purchase experiences and current situation. However, there is no consensus on which internal reference price is most frequently used by adolescents in judging external price information (Biswas et al., 1993). Consequently, since anchors can be arbitrary values (Ariely et al., 2003), it could be argued that by targeting adolescents with advertising containing high values, retailers could influence them to adjust their internal reference price, making them more accepting of higher prices.

To counter the anchoring bias and make more informed purchasing decisions, I propose several strategies that adolescent consumers can adopt based on insights from Alliance for Decision Education (2023). First, it's essential to be aware of the influence of external reference prices and recognize when they might be acting as anchors. Adolescents can actively seek out additional information about a product or service, considering factors beyond the initially presented price (Ahava & Palojoki, 2004). Comparing prices across different retailers, reading

reviews, and exploring alternatives can provide a broader perspective, helping to counter the impact of a singular anchor. Additionally, setting personal budgets and establishing a clear understanding of the product's value apart from its price can aid adolescents in making more rational choices. Developing a habit of critical thinking and questioning whether the presented price aligns with the actual worth of the product contributes to more reasoned decision-making. Lastly, seeking advice from trusted sources, such as friends, family, or online communities (e.g., Churchill & Moschis, 1979), can offer diverse perspectives and valuable insights, helping adolescents make purchasing decisions that align with their needs and values. These interventions are essential for enhancing the well-being of adolescent consumers (Manolis & Roberts, 2012).

Conclusion

The anchoring effect, explained by the Selective Accessibility Model, demonstrates its impact as a cognitive bias on adolescent information processing and decision-making in Decision Education. Guided by Alliance for Decision Education's (2023) important theoretical frameworks, I review primary factors such as mood, personality, cognitive ability, and expertise that contribute to individual differences in anchoring susceptibility. Furthermore, applications in negotiations, academic discussions, and daily purchasing highlight the broad influence of anchoring in adolescent contexts. Recognizing and mitigating anchoring bias is essential for fostering high-quality decision-making, thereby contributing to better outcomes for adolescents as effective learners, team project negotiators, and even everyday consumers.

As a final note, I also call on future scholars, practitioners, and policymakers to collaborate in efforts to *determine and develop relevant measurement tools* for understanding specifically the anchoring in adolescent decision-making styles (Alliance for Decision

Education, 2023), which, to my knowledge, appears to be relatively lacking in the literature.

Ultimately, the development of such useful, helpful measures and the further integration of these insights into Decision Education emerge as pivotal strategies for empowering adolescents as well as student learners with the theoretical knowledge and skills needed to navigate the complexities of anchoring bias, fostering a foundation for lifelong success in decision-making.

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