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ORIGINAL ARTICLE

Reward and Consequence Strategies in ADHD Support: A Discrete Choice Model Analysis of Primary Teachers' Preferences and Practices

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Abstract
In this study, we apply a stated preference experiment and discrete choice modelling to examine Greek primary teachers' preferences for reward and consequences strategies in supporting students with attention-deficit/hyperactivity disorder. We also investigate how these preferences differ based on teacher gender, educational attainment, and special education training. A total of 430 general and special education teachers completed 2,948 choice cards. Each card presented hypothetical scenarios combining five behavioural management attributes: verbal praise, responses to undesired behaviours, privilege removal, point-based systems, and tangible versus intangible rewards. Data were analysed using an alternative-specific conditional logit model. Verbal praise and intangible rewards (e.g., free time, token economies) received the highest preference ratings, while reprimands and privilege revocation were consistently disfavoured. Female teachers, those with postgraduate degrees, and special education trained educators assigned significantly greater utility to informational consequences and tangible rewards. Findings reveal a strong consensus among teachers in favour of positive reinforcement strategies and a reluctance to employ punitive measures. Professional development should emphasise reward-based techniques. Future research should link these stated preferences to actual classroom practices and student outcomes to assess their real-world effectiveness.

Keywords: ADHD in education; behaviour management in classrooms; primary education teachers; stated preference experiment (SPE)

Attention-deficit/hyperactivity disorder (ADHD) is one of the most frequently identified neuro-developmental conditions among school-aged children worldwide (Venkata & Panicker, 2013). According to the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.), ADHD is characterised by a persistent pattern of inattention and/or hyperactivity–impulsivity that interferes with functioning or development (American Psychiatric Association, 2013, p. 49). Students with ADHD often experience difficulties sustaining focus, following instructions, and organising materials, and they frequently appear forgetful or distracted during tasks. These core characteristics can affect academic performance but also hinder social integration; children with ADHD report lower self-perceived competence and face greater challenges in peer relationships compared to their typically developing peers (Cornoldi et al., 2013).

Students with ADHD consistently demonstrate lower academic achievement than their peers, which is reflected in reduced grades and weaker performance on standardised assessments (Loe & Feldman, 2007). They are also more likely to exhibit higher absenteeism, repeat a grade in elementary school, and drop out of high school (Barbaresi et al., 2007). Even among those who graduate, rates of postsecondary education enrolment remain substantially lower (DuPaul & Weyandt, 2009). These academic difficulties are often compounded by co-occurring conditions, such as learning disability, conduct disorder, and anxiety, which further increase the risk of educational and social difficulties (Barkley, 1997; DuPaul & Eckert, 1997).

While pharmacological interventions can reduce core ADHD symptoms and support academic performance (Jangmo et al., 2019), medication alone is insufficient. Effective support in the classroom requires a combination of medical and pedagogical strategies tailored to individual student needs (Barkley, 2006; DuPaul et al., 2011). Combining medical, behavioural, and educational strategies is the most effective means of supporting students with ADHD (DuPaul et al., 2011; Evans et al., 2018). There are various strategies that have been shown to be effective such as behavioural contracts (Cooper et al., 2019), technology-assisted approaches (Clarfield & Stoner, 2005; Mautone et al., 2005), peer-related strategies (Lessing & Wulfsohn, 2015), as well as parent-related techniques (DuPaul et al., 2020). Within this broader landscape, behaviour management strategies were chosen as the focus of the present study because they are among the most directly accessible and applicable approaches for teachers in everyday classroom settings. Among these, behaviour management approaches, particularly the structured use of rewards (positive reinforcement) and consequences (negative reinforcement), have proven effective in improving students' on-task behaviour and engagement (Emmer & Evertson, 2009; Hernandez & Reitman, 2014).

Holistic, individualised interventions during early schooling can foster both academic and behavioural improvements (DuPaul et al., 2011). Contingency-based self-management techniques, such as self-monitoring, self-evaluation, and self-reinforcement, encourage autonomy by enabling students to track and reward their own behaviour (Shapiro & Cole, 1994; Shapiro et al., 1998). Classroom management strategies often include token economies, where students earn tokens (e.g., stickers, stars) that are exchangeable for rewards, along with immediate, specific praise to reinforce positive behaviour (Emmer & Evertson, 2009; Hernandez & Reitman, 2014). Corrective techniques, including mild reprimands, response cost, and planned ignoring, aim to reduce inappropriate behaviours (DuPaul & Eckert, 1998; Kos, 2004). Once behavioural skills are established, self-management routines may offer longer-lasting improvements than externally imposed reinforcement (DuPaul et al., 2020).

Teachers play a central role in implementing inclusive education practices, and their beliefs and backgrounds shape how they support students with ADHD. Research on gender as a factor in teachers' attitudes presents mixed findings: some studies suggest male educators are more supportive of inclusion (Bhatnagar & Das, 2014; Ernst & Rogers, 2009), while others find that female teachers express more favourable views (Agavelyan et al., 2020; Saloviita, 2020) or report no significant differences (Ediyanto et al., 2022; Uka, 2025). However, one consistent finding is the importance of specialised training. Teachers with formal training in inclusive or special education (SE) demonstrate more positive attitudes and greater confidence in implementing classroom adaptations than those without such preparation (Boyle & Hernandez, 2016; Lee et al., 2015; Miškolci et al., 2021; Ricci & Fingon, 2018). In addition to gender and training, formal education levels also influence attitudes. Teachers with advanced degrees, especially in SE, tend to embrace adaptive interventions and view inclusion more positively (Boyle et al., 2013; Shippen et al., 2011). Recent cross-national studies confirmed that the highest degree obtained predicts favourable attitudes towards inclusion (Charitaki et al., 2025; Charitaki et al., 2024).

Despite these positive correlates, significant obstacles to the implementation of inclusive education remain (Kypriotaki & Pieridou, 2018). Studies with Greek samples reveal differing and sometimes contradictory findings regarding educators' perceptions of teaching students in mainstream classrooms (Kypriotaki & Pieridou, 2018). Although gender effects remain inconsistent, professional preparation, through both training and academic qualifications, consistently correlates with more supportive and proactive approaches to students with ADHD.

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Stated Preference Experiment in Education

Stated preference experiment (SPE), which is the experimental design used to collect preference data, and discrete choice models (DCM), which is the statistical methodology applied to analyse these data, provide a robust statistical framework for analysing decision-making processes in which individuals select from a set of discrete alternatives. Originally developed by McFadden (1974), these models have been widely applied in various fields, including marketing, transportation, healthcare, and policy research (Train, 2003). McFadden's pioneering work in econometric methods for studying behavioural patterns earned him the Nobel Memorial Prize in Economic Sciences in 2000. Despite their extensive application in numerous disciplines, DCMs have only recently been introduced in educational research, with limited studies exploring their potential (e.g., Acharya & Lee, 2018; Ahmed et al., 2022; Cunningham et al., 2014; Grammatikopoulos et al., 2019; Kostaki & Linardakis, 2025; Linardakis, 2025).

In this study, we employ SPE to investigate the preferences of primary education teachers, both general and special educators, regarding support techniques for students with ADHD. By using SPEs, participants are presented with hypothetical scenarios and asked to make choices between different alternatives. This methodology allows researchers to assess how individuals weigh different attributes and make trade-offs, offering deeper insights into their true preferences and attitudes (Doxanaki & Linardakis, 2022).

SPEs provide several advantages over traditional survey methods (Grammatikopoulos et al., 2019). Unlike standard questionnaires, which are prone to social desirability bias, where respondents may report what they perceive as socially acceptable rather than their true preferences (Larson, 2019; Vesely & Klöckner, 2020), SPEs offer an incentive-compatible environment that encourages participants to reveal genuine choices. Additionally, by simulating real-life decision-making scenarios, SPEs achieve higher external validity compared to traditional self-report measures (Haghani et al., 2021).

SPE is based on random utility theory, which assumes that individuals assign a certain level of utility to each available option and select the one that maximises their perceived benefit (Deely et al., 2019). This utility is influenced by observable attributes of the choices and the personal characteristics of the decision-maker, such as experience, attitudes, and contextual constraints. Unlike Likert-type rating scales and interviews, which may yield vague or inconsistent responses (Girio-Herrera & Sarno Owens, 2017), SPE forces respondents to engage in comparative decision-making, leading to more precise preference estimation (Grammatikopoulos et al., 2019).

One of the key strengths of SPE is its ability to quantify the relative importance of different attributes in decision-making processes. Conjoint analysis, a method frequently used in market research, structures decision-making by organising attributes into defined levels (Orme, 2013). For instance, when evaluating teaching techniques, attributes such as seating arrangements (e.g., sitting alone, sitting with diligent students, sitting with peers of choice) can be systematically analysed to determine their influence on teacher preferences. Additionally, conjoint simulations enable researchers to assess the desirability of intervention packages as they might be implemented in real educational settings (Delgadillo et al., 2020).

Furthermore, SPE facilitates segmental analysis, allowing researchers to identify distinct preference patterns among subgroups of educators (Deshmukh, 2021). This segmentation provides valuable insights into the diverse needs and expectations of teachers, which is essential for designing effective and targeted interventions for students with ADHD. By systematically evaluating preference structures, DCM helps uncover areas where teachers may require additional training or resources, enabling the development of more tailored and effective support strategies.

In this study, we seek to bridge the limited use of SPE in education by introducing a systematic approach to understanding teacher preferences regarding ADHD support techniques. Identifying the factors that influence these preferences is crucial, particularly given the significant time constraints that teachers face, which may affect their ability to adopt and maintain more intensive intervention strategies. Future research should further explore these determinants to refine educational policies and support systems, ultimately enhancing the effectiveness of ADHD interventions in classroom settings.

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In the present study, we explore primary education teachers' preferences for classroom support techniques targeting ADHD, with particular emphasis on reward and consequence systems. We examine how these preferences vary according to teacher gender, level of formal education, and SE training. The research was designed to answer the following question: What are the preferences of primary general and SE teachers regarding the use of rewards and consequences to support students with ADHD in the classroom, and how are these preferences influenced by teacher gender, educational qualifications, and specialised training?

To the best of our knowledge, this is the first study to apply DCM to investigate teacher preferences for ADHD-related instructional techniques in the context of primary education. The development of the experimental design and statistical models required extensive groundwork, including a careful operationalisation of attributes and levels, expert input, pilot testing, and advanced data analysis procedures. This comprehensive and novel approach provides new insights into the decision-making processes of educators and offers a robust foundation for shaping evidence-based educational interventions.

Materials and Methods

Participants and Procedures

The study was conducted in Greece during the 2023–2024 academic year and received ethical approval from the Ethics and Research Integrity Committee of the University of Crete (Approval No. 40/05.02.2024) as well as from the Ministry of Education and Religious Affairs (Approval No. Φ15/17384/ΑΛ/28097/Δ1). The participants were actively employed primary school teachers from various school types across the country.

At the beginning of the study, teachers completed a demographic questionnaire providing information on their gender, age, years of teaching experience, educational background, training in SE, school location, and specialty. A total of 430 Greek primary education teachers participated, comprising 350 general education teachers (81.4%) and 80 SE teachers (18.6%). The questionnaires were distributed to both general and SE schools, and responses were collected from teachers working in general classrooms, SE classrooms, as well as integration classrooms functioning in general schools. Each respondent randomly answered six, seven, or eight hypothetical scenarios (choice cards) from the total set of 27 cards, resulting in a final dataset of 2,948 completed choice cards (Table 1).

To determine an appropriate sample size, we considered prior research suggesting that sample sizes exceeding 100 are sufficient for DCMs (Pearmain & Kroes, 1990). Additionally, studies indicate that at least 20 respondents per questionnaire version are adequate for reliable model estimations (Lancsar & Louviere, 2008). To mitigate respondent fatigue while preserving the validity of the model, each participant was presented with only a subset of the total generated scenarios. This approach ensured that all 27 cards were systematically completed by the total sample.

SPE Design, Attributes, and Levels

The design of the SPE began with the identification of all relevant attributes related to the research question, a crucial step in developing a robust model (Kløjgaard et al., 2012; Lancsar & Louviere, 2008). This process required a thorough understanding of the characteristics associated with the investigated variables (Doxanaki & Linardakis, 2022).

The attributes used in this study were identified through a comprehensive review of the literature on support strategies for students with ADHD. All suggested techniques were collected and then filtered to retain only those that could be feasibly implemented at the classroom level by educators. These techniques were subsequently grouped based on shared characteristics. The next step was to select the levels of each attribute so as to cover a range from a low to an excellent form of reward or punishment. These levels were defined through semistructured interviews with SE professionals, general education

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Table 1. Teacher Study Sample: Demographic Profile

Demographic characteristics ($N = 430$)		
Sample description	Frequency	Percentage (%)
Gender		
Male	88	20.5
Female	342	79.5
Age		
21 to 30 years	72	16.7
31 to 40 years	120	27.9
41 to 50 years	92	21.4
51 to 60 years	134	31.2
61+ years	12	2.8
Experience		
0 to 5 years	100	23.3
6 to 15 years	73	17
16 to 25 years	151	35.1
26+ years	106	24.7
Highest degree		
Bachelor's degree	197	45.8
Master's degree	221	51.4
PhD	12	2.8
Special education training		
No	197	45.8
Yes	233	54.2
School location		
Urban	279	64.9
Semi-urban	71	16.5
Rural	80	18.6
Certification		
General education	350	81.4
Special education	80	18.6
Experience teaching students with ADHD		
No	43	10
Yes	387	90

teachers currently teaching students with ADHD, and mental health experts, including sociologists and child psychologists. The levels that were chosen are presented in the third column of Table 2. To maintain the clarity and manageability of the experimental design, only strategies involving rewards and penalties were retained, while more complex or multifaceted interventions were excluded

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Table 2. Attributes and Levels in the Stated Preference Experiment Design

Category	Attribute	Levels
Verbal response (VR)	Provide verbal rewards	I provide verbal praise when the student makes an effort or achieves a goal. I do not provide verbal praise when the student makes an effort or achieves a goal.
	Consequences for undesired behaviours	I do not react every time the student exhibits an undesired behaviour. I appeal to the student's sense of honour every time they exhibit an undesired behaviour. I inform the student that there will be consequences every time they exhibit an undesired behaviour. I reprimand the student every time they exhibit an undesired behaviour.
Material response (MR)	Removal of privileges	I do not revoke privileges when the student fails to achieve a goal. I revoke privileges when the student fails to achieve a goal.
	Point-based system	I do not use a reward system based on point accumulation. I use a reward system based on point accumulation, with a reward for all students on a monthly basis. I use a reward system based on point accumulation, with a reward for all students on a weekly basis.
	Tangible and intangible rewards	I do not provide any rewards when the student achieves a goal. I provide tangible rewards (e.g., a small gift, a sticker, etc.) when the student achieves a goal. I provide intangible rewards (e.g., free time or play) when the student achieves a goal.

(Kløjgaard et al., 2012; Lancsar & Louviere, 2008). The final SPE model incorporated five attributes, which were organised into two broader categories (Table 2).

An orthogonal experimental design was employed, generating 27 unique scenarios, each containing three alternatives. In the first two alternatives, participants were asked to choose the teaching scenario that most closely aligned with their classroom practices. A third neutral alternative was also available. An example of a choice card used in this study is presented in Figure 1.

The alternatives presented on each card reflect real-life educational techniques, ensuring that participants made realistic and meaningful choices (Table 2).

Statistical Analysis

Data were collected through an online questionnaire created using Google Forms. The survey link was initially distributed to official school email addresses via regional primary education offices and then forwarded to teachers by school principals. The questionnaire began with a detailed description of the study's ethical approval and informed consent procedures. A multistage sampling approach was employed to ensure broad geographic representation (Creswell, 2014). In the first stage, cluster sampling was used to randomly select several regional directorates from across Greece. In the second stage, simple random sampling was applied within each selected cluster to choose 20 primary education directorates, reflecting a balance of urban, semi-urban, and rural areas. The final step involved distributing the questionnaire to schools within these directorates, where school administrators coordinated its dissemination to teaching staff.

For statistical analysis, Stata Version 14.2 (StataCorp, 2016) software was used to conduct an alternative-specific conditional logit regression following McFadden's choice model framework. This method allowed us to estimate choice probabilities by incorporating both decision-maker and alternative attributes, in line with random utility theory. The conditional logit model, developed by McFadden (1974), is a cornerstone in discrete choice econometrics and is based on the random utility model, which explains individual choice behaviour.

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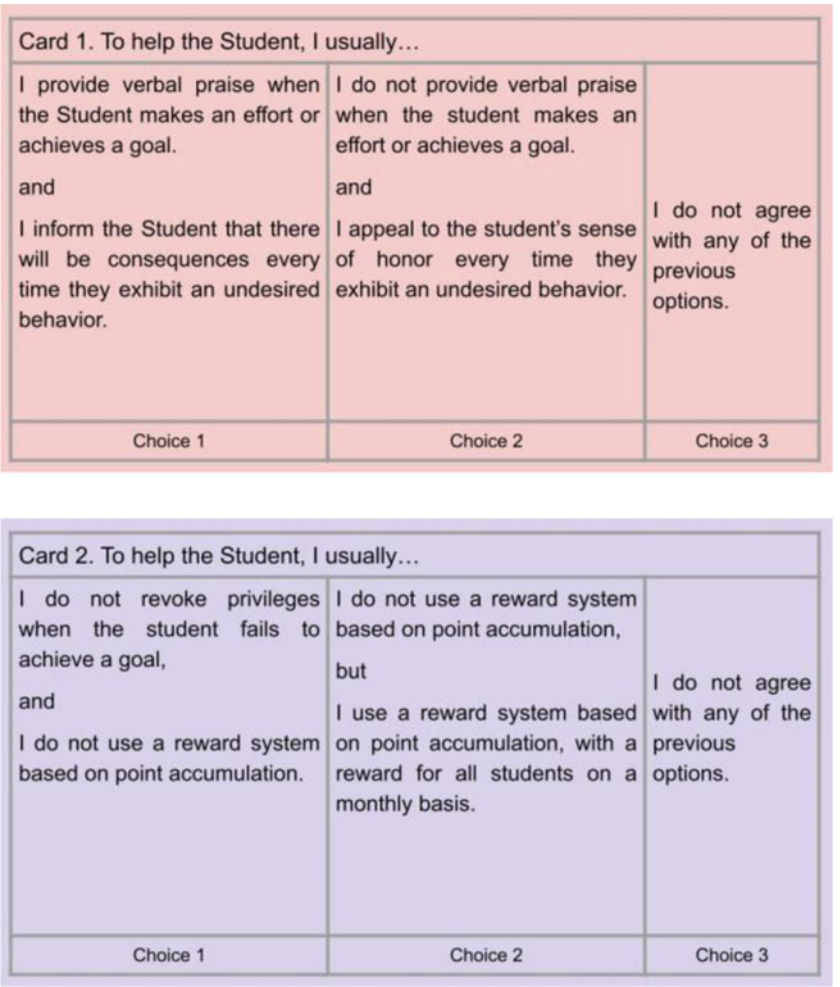

Card 1. To help the Student, I usually…		
I provide verbal praise when the Student makes an effort or achieves a goal. and I inform the Student that there will be consequences every time they exhibit an undesired behavior.	I do not provide verbal praise when the student makes an effort or achieves a goal. and I appeal to the student's sense of honor every time they exhibit an undesired behavior.	I do not agree with any of the previous options.
Choice 1	Choice 2	Choice 3

Card 2. To help the Student, I usually…		
I do not revoke privileges when the student fails to achieve a goal, and I do not use a reward system based on point accumulation.	I do not use a reward system based on point accumulation, but I use a reward system based on point accumulation, with a reward for all students on a monthly basis.	I do not agree with any of the previous options.
Choice 1	Choice 2	Choice 3

Figure 1. Sample of Choice Cards.

The model used in this study is based on the idea that people make choices by comparing the available options and selecting the one that gives them the highest level of satisfaction or utility. This approach assumes that the random factors influencing individual decisions are similar across all options and are not related to each other. It follows a well-established decision-making framework that has been widely used in the study of consumer preferences (McFadden, 1974).

To explore these preferences, the study relies on stated preference data, which allow for the application of advanced analytical techniques like DCMs, a type of method commonly used in conjoint analysis. These techniques help reveal how participants weigh different features of the options presented to them. In this study, each choice scenario included three different options. Participants were asked to choose the one they preferred most. Typically, only one option is selected, but more complex formats may ask respondents to rank all the options or indicate which ones they find equally preferable (Linardakis & Dellaportas, 2003).

By default, the alternative-specific conditional logit model estimates a constant for each alternative. However, in this study, Alternatives 1 and 2 did not differ in any inherent way; the variation between them resulted solely from the randomised allocation of attribute levels. As such, it was methodologically appropriate to suppress the estimation of alternative-specific constants for these

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two options. This was implemented by applying no-constant terms to Alternatives 1 and 2 within the choice models. A constant term was retained only for Alternative 3, which was substantively different, as it represented the option to opt out of the techniques described in the other two alternatives. Including a single constant via a dummy variable for this third alternative allowed the model to capture the unique utility associated with the opt-out choice, while avoiding misinterpretation of indistinguishable alternatives.

Additionally, IBM SPSS Statistics Version 21 was used for demographic statistics and for implementing the orthogonal design, ensuring a rigorous and comprehensive data analysis approach.

Results

An SPE (McFadden's alternative-specific conditional logit) was implemented and distributed to 430 participants who responded to a total of approximately 2,948 choice cards (with an average of seven cards per participant). The DCM analyses focused on the participants' decisions between two alternative teaching technique scenarios aimed at supporting students with ADHD, categorised as verbal response (VR) and material response (MR). A third option, 'I do not agree with any of the previous options,' was also included. These analyses were conducted on segmented datasets based on participant characteristics, rather than the full sample, as described in the methodology.

Results by Gender Segmentation

To explore whether gender influenced preferences, an alternative-specific conditional logit model was used on each gender segmentation separately. Male participants responded to approximately 616 cards, while female participants completed around 2,389 cards (Table 3).

Verbal response (VR)

Both men ($b_{v\_awards} = 1.49$, $p < 0.01$) and women ($b_{v\_awards} = 1.71$, $p < 0.01$) were highly likely to provide verbal rewards to students who achieved their goals. In cases of undesired behaviour, both genders showed a clear preference against reprimanding students, instead favouring nonreactive strategies or informing students of potential consequences (all responses negative and statistically significant, $p < 0.01$), while women might inform them that there will be consequences if they continue ($b_{warning} = 0.25$, $p = 0.05$). The neutral option was also negatively and significantly associated with both genders ($p < 0.01$), suggesting low preference for this choice.

Material response (MR)

Both groups were unlikely to revoke privileges in response to undesired behaviour (negative and statistically significant, $p < 0.01$). Women were more inclined to use a point-based reward system ($b_{point\_sys} = 0.46$, $p < 0.01$) and to provide tangible rewards ($b_{tangible} = 0.33$, $p < 0.01$) compared to men, for whom these preferences were either marginally significant or nonsignificant. However, both men ($b_{intangible} = 0.88$, $p < 0.01$) and women ($b_{intangible} = 1.35$, $p < 0.01$) favoured providing intangible rewards. The neutral option was nonsignificant for both, indicating occasional selection but no strong preference.

Results by Academic Background Segmentation

To investigate the impact of educational attainment, the sample was divided into two segments: participants with only a bachelor's degree ($n = 197$, 1,379 cards) and those with a master's degree or higher ($n = 233$, 1,631 cards; Table 4).

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Table 3. Impact of Respondent Gender on Preferences for ADHD Support Techniques: Stated Preference Experiment Parameter Estimates

Alternative-specific conditional logit						
	Male ($n = 88$)			Female ($n = 342$)		
	b	*z*	*p*	*b*	*z*	*p*
Verbal praise	1.49	6.81	<0.01	1.71	16.03	<0.01
Undesired behaviour – Do nothing – Ref. Cat.						
Undesired behaviour – Sense of honour	0.43	1.75	0.08	−0.69	−056	0.58
Undesired behaviour – Warning	0.02	0.06	0.96	0.25	1.94	0.05
Undesired behaviour – Reprimand	−1.09	−4.31	<0.01	−1.34	−9.23	<0.01
Constant of 3rd alt	−1.43	−5.80	<0.01	−1.22	−9.90	<0.01
Log likelihood	−226.57			−842.43		
Wald chi2 (6)	137.70 ($p < 0.01$)			525.99 ($p < 0.01$)		
Revoke privileges	−0.68	−3.11	<0.01	−0.39	−3.81	<0.01
Point system	0.18	1.82	0.07	0.46	8.34	<0.01
Rewards – No – Ref. Cat.						
Rewards – Tangible	−0.08	−0.33	0.75	0.33	2.89	<0.01
Rewards – Intangible	0.88	4.32	<0.01	1.35	11.85	<0.00
Constant of 3rd alt	−0.33	−0.19	0.85	0.17	1.73	0.08
Log likelihood	−296.40			−1021.04		
Wald chi2 (6)	41.50 ($p < 0.01$)			256.68 ($p < 0.01$)		

Verbal response (VR)

Both educational groups were likely to provide verbal rewards ($p < 0.01$). Those with postgraduate qualifications were more likely to inform students about consequences ($b_{warning} = 0.31$, $p = .04$), while bachelor's-only participants showed a tendency not to react. No group significantly favoured appealing to students' sense of honour. Both segments strongly rejected the reprimanding option ($p < 0.01$), and the neutral choice was again significantly negative ($p < 0.01$).

Material response (MR)

Neither group preferred revoking privileges ($p < 0.01$). Both segments supported the use of point-based reward systems ($p < 0.01$). Teachers with postgraduate qualifications were significantly more likely to provide tangible rewards ($b_{tangible} = 0.29$, $p = .04$) compared to those with only undergraduate degrees ($b_{tangible} = 0.19$, $p = .22$). All educators, regardless of education level, were likely to give intangible rewards ($p < 0.01$). Neutral choices were positive but not significant, indicating low preference.

Results by Training in SE Segmentation

This analysis compared educators with ($n = 233$, 1,631 cards) and without ($n = 197$, 1,379 cards) formal SE training (Table 5).

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Table 4. Impact of Studies on Preferences for ADHD Support Techniques: Stated Preference Experiment Parameter Estimates

Alternative-specific conditional logit						
	BSc (n = 197)			MSc and/or PhD (n = 233)		
	b	*z*	*p*	*b*	*z*	*p*
Verbal praise	1.71	11.68	<0.01	1.59	12.81	<0.01
Undesired behaviour – Do nothing – Ref. Cat.						
Undesired behaviour – Sense of honour	−0.52	−0.32	0.75	0.12	0.80	0.43
Undesired behaviour – Warning	0.38	0.22	0.83	0.31	2.06	0.04
Undesired behaviour – Reprimand	−1.38	−7.49	<0.01	−1.14	−6.72	<0.01
Constant of 3rd alt	−1.49	−8.89	<0.01	−1.07	−7.32	<0.01
Log likelihood	−470.18			−601.35		
Wald chi2 (6)	318.91 ($p < 0.01$)			345.67 ($p < 0.01$)		
Revoke privileges	−0.56	−4.07	<0.01	−0.32	−2.61	<0.01
Point system	0.35	4.99	<0.01	0.44	6.52	<0.01
Rewards – No – Ref. Cat.						
Rewards – Tangible	0.19	1.23	0.22	0.29	2.07	0.04
Rewards – Intangible	1.06	7.37	<0.01	1.40	10.20	<0.01
Constant of 3rd alt	0.36	0.29	0.78	0.21	1.71	0.09
Log likelihood	−621.38			−700.98		
Wald chi2 (6)	117.91 ($p < 0.01$)			175.95 ($p < 0.01$)		

Verbal response (VR)

Both groups were significantly likely to provide verbal rewards ($p < 0.01$). SE-trained teachers were more likely to inform students about consequences ($b_{warning} = 0.31$, $p = .03$), whereas untrained teachers showed no strong response ($b_{warning} = 0.00$, $p = .99$). Neither group preferred reprimanding ($p < 0.01$), and the neutral option was significantly negative ($p < 0.01$).

Material response (MR)

Both groups opposed revoking privileges ($p < 0.01$). Point-based reward systems were favoured across segments ($p < 0.01$). SE-trained teachers were significantly more inclined to offer tangible rewards ($b_{tangible} = 0.27$, $p = .04$), while untrained teachers were not ($b_{tangible} = 0.19$, $p = .27$). Both segments supported intangible rewards ($p < 0.01$). The neutral choice was not significant, indicating occasional but uncommon use.

Discussion

Students diagnosed with ADHD often demonstrate lower academic achievement compared to their non-ADHD peers, often facing challenges with daily classroom demands, particularly when instructional practices and expectations are absent (DuPaul & Weyandt, 2009; Loe & Feldman, 2007). The frequent co-occurrence of learning disabilities, conduct disorders, and internalising difficulties such as anxiety further increases their risk for academic and social challenges, especially when appropriate supports are not in place (Barkley, 1997; DuPaul & Eckert, 1997). However, the

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Table 5. Impact of Special Education (SE) Training on Preferences for ADHD Support Techniques: Stated Preference Experiment Parameter Estimates

Alternative-specific conditional logit						
	SE training – No ($n = 197$)			SE training – Yes ($n = 233$)		
	b	*z*	*p*	*b*	*z*	*p*
Verbal praise	1.58	10.44	<0.01	1.68	13.84	<0.01
Undesired behaviour – Do nothing – Ref. Cat.						
Undesired behaviour – Sense of honour	0.78	0.44	0.66	0.16	0.12	0.91
Undesired behaviour – Warning	0.00	0.01	0.99	0.31	2.14	0.03
Undesired behaviour – Reprimand	−1.25	−6.34	<0.01	−1.26	−7.78	<0.01
Constant of 3rd alt	−1.29	−7.36	<0.01	−1.24	−8.77	<0.01
Log likelihood	−418.81			−653.75		
Wald chi2 (6)	251.64 ($p < 0.01$)			412.88 ($p < 0.01$)		
Revoke privileges	−0.60	−3.89	<0.01	−0.33	−2.86	0.04
Point system	0.20	2.57	<0.01	0.51	8.22	<0.01
Rewards – No – Ref. Cat.						
Rewards – Tangible	0.19	1.10	0.27	0.27	2.05	0.04
Rewards – Intangible	1.09	6.85	<0.01	1.34	10.54	<0.01
Constant of 3rd alt	0.11	0.83	0.41	0.13	1.13	0.26
Log likelihood	−515.95			−799.24		
Wald chi2 (6)	78.34 ($p < 0.01$)			225.14 ($p < 0.01$)		

implementation of targeted instructional techniques can help overcome these challenges, leading to both academic and behavioural improvements (Barkley, 2006; DuPaul et al., 2011). In particular, the structured use of positive reinforcement (rewards) and negative reinforcement (consequences) has shown promise in promoting on-task behaviour and enhancing classroom engagement for students with ADHD.

In the present study, we aimed to (a) establish an SPE that reflects the key characteristics of educational techniques proven effective in engaging students with ADHD; (b) examine the preferences of general and SE teachers regarding classroom support methods, especially reward and consequence systems; and (c) explore the influence of variables such as gender, educational background, and SE training on these preferences. DCM, a novel approach in this research area, was employed to overcome the limitations of traditional self-report tools, offering clearer insights into teachers' priorities when multiple support options are presented. This approach is crucial for designing interventions that are both pedagogically sound and practically applicable in diverse educational settings.

The results indicate that, across all teacher segments, gender, academic background, and SE training, providing verbal rewards to students who achieve their goals is the most highly valued strategy, exhibiting the highest positive utility and statistical significance. Informing students that undesirable behaviours will lead to consequences also yields positive utilities, though substantially lower than those for verbal praise. This preference is especially pronounced among female teachers, those with advanced degrees (MSc/PhD), and SE-trained educators. This finding may reflect a strategic use of proactive discipline, allowing teachers, particularly women, to maintain classroom control in a way that aligns with socially ascribed caring roles. At the same time, it enables them to assert authority without

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resorting to harsher measures that might be misinterpreted or conflict with gender expectations (Potokri & Lumadi, 2025; Read, 2008). Similarly, teachers with advanced degrees, especially those trained in SE, tend to adopt more adaptive, student-centred interventions and hold more positive views towards inclusion. This may also explain their preference for proactive strategies over punitive approaches (Boyle et al., 2013; Shippen et al., 2011). In contrast, reprimanding students for undesired behaviours carries negative or nonsignificant utilities in every segment. This fact suggests a collective reluctance to employ mild reprimands, response cost, or planned ignoring, despite literature supporting their efficacy in reducing inappropriate behaviours (DuPaul & Eckert, 1998; Kos, 2004). This unified avoidance likely reflects findings by Caldarella et al. (2021), showing that teachers who deliver low rates of negative feedback and high rates of positive feedback achieve greater long-term engagement with students with emotional or behavioural difficulties. In contrast, reprimands can trigger escape-motivated behaviours and aggression and fail to produce durable behaviour change.

Similarly, in the MR category, intangible rewards, such as token economies where students earn stickers or stars, consistently command the highest utility across all groups, followed by point-based reward systems. Female teachers, highly educated instructors, and SE-trained professionals exhibit stronger preferences for these positive reinforcement techniques. This preference may be attributed to findings suggesting that intangible elements improve students' cognitive engagement and promote higher quality academic work (Huang & Hew, 2018; Jong et al., 2018). Tangible rewards hold moderate utility, most notably among the same subgroups. This aligns with research indicating that tangible rewards have a positive influence on students' intrinsic motivation, increase behavioural engagement, and enhance cognitive engagement (Xiao & Hew, 2024). In contrast, revoking privileges in response to misconduct is uniformly disfavoured, revealing a broad aversion to punitive measures that the literature nonetheless links to behaviour reduction through response cost (DuPaul & Eckert, 1998; Kos, 2004).

A comparative analysis of these influencing factors shows that although the overall hierarchy of preferred strategies remains stable, favouring rewards over punitive interventions, the magnitude of those preferences varies by teacher characteristics. Female educators consistently assign greater utility to both verbal and intangible rewards, reflecting more favourable attitudes towards inclusive practices (Agavelyan et al., 2020; Saloviita, 2020). Advanced academic qualifications and specialised training in SE amplify teachers' openness to informational consequences and tangible rewards, underscoring the impact of formal education and practical preparation on receptivity to adaptive interventions (Boyle et al., 2013; Lee et al., 2015).

In conclusion, the findings underscore a clear consensus among teachers for employing positive reinforcement, both verbal and token-based, as the cornerstone of classroom support for students with ADHD, while punitive strategies such as reprimands and privilege revocation are consistently de-emphasised. The variations in utility strength tied to gender, academic background, and SE training suggest that professional development initiatives should prioritise reward-focused techniques and tailor training to bolster educators' confidence in delivering constructive consequences. By aligning support programs with these empirically grounded preferences, schools can enhance engagement and academic outcomes for students with ADHD.

This study contributes to the understanding of teacher preferences regarding specific support techniques by applying a DCM approach, which captures decision-making in a structured yet realistic way. Although we examined a limited set of verbal and material support strategies, this narrowing was essential to maintain manageable and interpretable choice tasks. Crucially, the methodological design, requiring participants to compare alternatives and make trade-offs, yields more behaviourally valid insights than traditional rating-based surveys. In contrast to methods that prompt socially or academically desirable responses, the choice scenarios in this study asked participants to select the option that most closely resembled their actual classroom practice. As such, the findings provide a more authentic representation of what teachers are likely to implement rather than what they might ideally endorse.

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Limitations and Future Implications

The findings of the present study should be interpreted in light of several limitations. First, our sample was predominantly female, which may have skewed utilities towards strategies more favoured by women and limits the extent to which our results generalise to male teachers. Second, the study focused on a narrow set of verbal and material support techniques, omitting other evidence-based approaches such as peer-mediated interventions, self-monitoring, or technology-assisted prompts. This limitation was a necessary methodological choice. In SPE, each scenario (or choice set) must be designed with a manageable number of attributes and options; including too many elements results in overly complex choice tasks that overwhelm respondents and hinder their ability to meaningfully evaluate and compare alternatives. Therefore, a subset of techniques was selected to ensure the clarity and feasibility of the choice tasks presented. Third, contextual factors, such as school resources, class size, and cultural norms around discipline, were not assessed but may substantially shape teachers' willingness and ability to implement these techniques. Finally, we did not examine student-level outcomes; instead, we focused solely on teachers' practices. However, without linking teacher preferences to measures of student engagement, behaviour change, or academic progress, the practical impact of these prioritised strategies remains uncertain.

Researchers of future studies should address these gaps by recruiting more balanced and diverse teacher samples across regions and educational systems, thereby enhancing generalisability. Longitudinal or experimental designs that observe teachers' real-world application of support techniques and track corresponding student outcomes would provide stronger evidence of effectiveness. Incorporating additional teacher characteristics, such as age, overall years of experience, stress, self-efficacy, burnout, and content knowledge about ADHD, could clarify how personal and professional factors interact to influence strategy choice. Expanding the discrete-choice framework to include a broader array of interventions (e.g., digital platforms, peer tutoring, self-management tools) will help identify optimal combinations of supports. Finally, intervention studies that integrate training modules based on these preferences and measure subsequent changes in classroom practice and student achievement will be essential for translating teacher priorities into sustainable, evidence-based educational reforms.

Data availability statement. The dataset analysed during the current study is available at https://figshare.com/s/b41c2b20d7dff54bd045

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