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The Examination of the Relationship Between Humour and Cartoon Drawing Ability and Giftedness: A Logistic Regression Analysis

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ABSTRACT

This research examines the relationship between humour, cartoon drawing ability, and the likelihood of being gifted. It aims to determine how humour and cartoon drawing skills of gifted and typically developing students relate to giftedness. The study used a quantitative approach within a correlational survey model, with a sample of 203 students (102 gifted, 101 non-gifted) during the 2023–2024 academic year. The sample was selected using purposive sampling, specifically convenience sampling. Data were collected using the "Cartoon Evaluation Scale." The findings show that humour ability in joke-based cartoons significantly affects the likelihood of being gifted. Both humour and drawing skills were determining factors in situation-based cartoons. Logistic regression analysis revealed a strong relationship between humour ability and giftedness ($\chi^2(2) = 46.83$, $p < .001$, Nagelkerke $R^2 = .482$). Humour ability significantly predicted giftedness (B = 2.10, SE = .42, $p < .001$, OR = 8.17), while drawing skill also predicted giftedness, though to a lesser extent (B = 0.87, SE = .35, $p = .013$, OR = 2.39). These results suggest that humour and cartoon drawing abilities can be effective tools in identifying gifted students. Teachers may consider these abilities when nominating students as gifted. Additionally, exploring activities beyond cartoons, such as creating funny videos or writing humorous stories, could also help identify giftedness.

Keywords: The likelihood of being gifted, humour ability, cartoon drawing ability, intelligence-humour relationship, identification of gifted students.

Introduction

The development of thought, individual behaviours, and learning mechanisms has long been subjects of curiosity throughout history. Intelligence is regarded as a key component in these processes, and identifying students' intellectual profiles is essential for educators. Intelligence istypically associated with a range of abilties, such as problem-solving ability, abstract thinking, adaptabiilty, knowledge transfer, logical reasoning, goal-directed behaviour, and metacognition (Alfonso Benlliure & Minguez, 2022; Kızıltepe, 2004; Piaget & Cook, 1952; Radwan, 2005; Sternberg & Detterman, 1986; Sternberg, 2003; Sternberg, 2012). Howard Gardner's (1983) Theory of Multiple Intelligences conceptualizes intelligence as a multidimensional construct, offering insight into individual learning processes.

Theories of intelligence define the construct by identifying cognitive sub-components, which are typically assessed using standardized intelligence tests. These tests are widely used to evaluate individuals' cognitive functions. General intelligence (IQ) scores are derived from the combined results of several subtests (Brody, 1999; Uluç et al., 2011). These subtests assess a variety of domains, including attention and perceptual reasoning, spatial abilities, working memory, processing speed, verbal comprehension, and reasoning skills. Attention and perceptual reasoning are fundamental components of many intelligence tests, assessing skills such as nonverbal concept formation, visual perception, and motor coordination (Palmer, 1993). One of the core components of intelligence is spatial abilities; the ability to mentally manipulate and rotate objects is considered a key aspect of visual processing (Guilford & Zimmerman, 1947) and is measured through tasks assessing mental rotation and part-whole relationships. Mental rotation strengthens the relationship between spatial abilities and general cognitive functions, as it enhances individuals' ability to visualize objects from different perspectives. Verbal comprehension, a key component of intelligence, refers to individuals' ability to understand, interpret, and use linguistic information. This ability encompasses vocabulary knowledge, grammatical rules, and the comprehension of meaning in language. Verbal comprehension is closely

associated with language and cognitive development. As children develop their vocabulary knowledge, their reading and comprehension skills also improve. Additionally, knowledge-based tests assess children's comprehension of broad general knowledge topics. Among intelligence factors, numerical abilities, processing speed, verbal comprehension, attention, and executive functions hold significant importance. Numerical abilities involve the capacity to perform arithmetic operations quickly and are associated with reasoning and logical thinking (Deary et al., 2007; Gottfredson, 1997). Working memory is a complex structure that encompasses cognitive skills such as mental organization, attention, and both short- and long-term memory (Baddeley, 2012), and a high-functioning working memory capacity is linked to gifted intelligence (Alloway, 2009; Gowan, 2005). Gifted students tend to have highly developed attention skills, excelling in initiating, maintaining, and completing tasks (Ataman, 2007; Hegarty & Waller, 2004; Newcombe, 2010). In addition to their cognitive strengths, gifted individuals also exhibit advanced social and emotional characteristics.

Gifted students often exhibit heightened sensitivity and empathy in their social and emotional characteristics (Neihart, 1999). They tend to show an early interest in moral values and demonstrate a strong sensitivity to injustice (Cross, 2011). Their perfectionistic tendencies may result in a strong aversion to failure, which can either foster motivation or impede their coping mechanisms (Pfeiffer & Stocking, 2000). Their pursuit of independence and leadership qualities enable them to take an active role within groups. However, they are also at risk of experiencing social and emotional difficulties (Coleman & Cross, 2014). Therefore, cultivating educational environments that adress their unique cognitive and emotional needs is essential to support their potential (Çağlar, 2004).

Various characteristics of gifted children are closely related to humour. Owing to their heightened sensitivity (Cross & Mendaglio, 1994; Mendaglio, 2002), these students often engage with complex social, moral, and ethical issues through humour. Perfectionism, is a common trait among gifted children, can bee moderated through humour, which offers a constructive lens for recognizing and accepting human imperfections. Their capacity to connect underlying patterns further enhances their appreciation of humour and the contradictions it reveals in the world. Creativity, cognitive flexibility, and self-expression are defining traits of gifted children (Renzulli, 1977), and in this regard, they tend to use humour extensively (Ziv, 1984).

Humour functions as a channel for emotional and cognitive expression and contributes to the development of organizational thinking and precise communication skills. Gifted students often demonstrate advanced abstract reasoning and rapid information acquisition and processing abilities, which enable them to comprehend and reflect on complex concepts typically reserved for older individuals (Gross, 1989). Hollingworth (1926) noted that while typically developing children remain preoccupied with egocentric concerns, gifted children become highly aware of questions related to origins, destiny, and philosophical issues.

Gifted individuals are widely recognized for their advanced thinking skills. Their creative and critical thinking abilities manifest in their competence to solve complex problems, generate innovative ideas, and question existing knowledge. Critical thinking skills also enhance their ability to differentiate between fact and fiction in both academic and social contexts (Martin, 2007). Humour and cartoons serve as concrete examples of these cognitive skills. Research indicates that gifted students develop multiple perspectives on universal values such as empathy, social awareness, and justice when interpreting cartoons. In addition to stimulating higher-order thinking, such materials promote student engagement and motivation by integrating humour into the learning process (Rule & Montgomery, 2013).

Gifted individuals possess the ability to engage in high-level abstract humour through the creation of analogies, puzzles, and riddles (Rule & Schneider, 2009). In this context, cartoons are considered an effective instructional tool that supports the cognitive, affective, and social development of gifted individuals (Göçer & Akgül, 2020).

Humour is the ability to express a situation or thought in an entertaining and creative manner. Defined as a social phenomenon, humour evokes laughter and amusement in individuals (Martin, 2007). It is widely recognized as an indicator of creative abilities (Gowan, 1968; Torrance, 1962). Koestler (1964) examined the logical structure and emotional dynamics of humour, associating it with the concept of bisociation—where two independent levels of thought or ideas merge to create new meaning or humour.

The positive effects of humour on learning and social interaction highlight the necessity of encouraging its use in classroom settings (Cousins, 2016; Gardner, 1983). By employing elements such as jokes, irony, and satire, humour enables individuals to reflect critically on thoughts, emotions, and social norms. Individuals with a strong sense of humour tend to create a positive social atmosphere and form healthier relationships (Provine, 2000). Furthermore, humour has been shown to play a beneficial role in coping with stress and enhancing psychological well-being (Kuiper & McHale, 2009).

People express humour in various ways. Verbal humour creates an entertaining atmosphere in social interactions through jokes and wordplay, while written humour conveys social criticism in a humorous tone through cartoons and satirical magazines. Visual humour delivers amusing messages to audiences through cartoons and comic strips, whereas performing arts showcase humour on stage through stand-up comedy and theatre.

Cartoons, as an effective medium of humour, depict social events and individual behaviours in an amusing manner. This art form consists of three fundamental elements: drawing, amusement, and reflection. The amusement element aims to capture the audience's attention and enhance their engagement and motivation (Uslu, 2007), while the reflection element encourages individuals to analyse cartoons and develop higher-order thinking skills (Göçer & Akgül, 2020). Cartoons serve as an effective learning resource for both gifted and typically developing students. In this regard, they contribute to a deeper understanding of concepts through humour and promote effective use of critical thinking skills (Rule & Montgomery, 2013). Additionally, cartoons enable individuals to question social and cultural norms, skilfully incorporating humorous elements to present social criticism in an entertaining manner (Klavir & Gorodetsky, 2001). Cartoonists such as Charles Addams et al. have successfully used satire to critique societal norms while engaging their audiences in thought-provoking ways (Baker, 2012; Johnson, 2016). Therefore, cartoons hold a significant role both as a source of entertainment and as a tool for critical thinking.

The concept of "cartoon"as a tool for humour (Bakır, 2008) can be defined in various ways. According to McBride and Verbeck (1895) cartoon is the altered depiction of a character to express admiration, sensitivity, and desire. The Turkish Language Association (2024) defines cartoon as an exaggerated, thought-provoking, and humorous illustration that addresses all kinds of events related to humans and society, making it an element that appeals to all people. However, due to its subtle satire, thought-provoking nature, and ability to depict events from a different perspective, it is a form more easily comprehended and created by intelligent individuals (Greengross, 2008).

Cartoons include satirical and exaggerated drawings designed to amuse and provoke thought. They highlight the humorous aspects of a subject and transform them into a form of comedy through exaggerated illustrations (Seçgin et al., 2010, p. 392). Levine and Redlich (1960) found a strong correlation between the ability to understand cartoons and scores on the Wechsler Adult Intelligence Scale. Zigler et al. (1966) discovered a significant relationship between the comprehension of cartoons and cognitive development levels. Ziv (1984) demonstrated that the ability to understand and appreciate jokes and cartoons is associated cognitive development. Gifted children tend to learn more quickly and exhibit advanced cognitive development compared to their peers through their humour comprehension and ability to interpret cartoons Ministry of National Education [MoNE], 2007). These children can engage in high-level abstract humour by creating humorous wordplays, such as analogies, puzzles, and riddles (Rule & Schneider, 2009). A well-developed linguistic foundation and intellectual experience enhance the humour comprehension of gifted children (Shade, 1991), enabling them to develop a humorous perspective on social, moral, and ethical issues (Elcik & Bayındır, 2015).

The relationship between intelligence and humour ability has been the subject of numerous studies throughout history. Humour has been recognized as an indicator of high intelligence levels (Li et al., 2020). Various studies have found a positive correlation between general intelligence and humour ability. Feingold (1983) reported a correlation of 0.58 between intelligence and humour while measuring humour ability. However, this relationship varies depending on age and culture (Sternberg, 2003; Yue, 2010). Sak (2007) stated that Turkish culture integrates humour with reasoning, which leads to the expectation of a strong correlation between children's humour ability and intelligence levels. In a study by Arslan et al. (2021), verbal reasoning ability was identified as the strongest predictor of humour ability ($\beta = 0.325$, $p < 0.001$), and there was a high correlation (0.82) between intelligence and humour ability. In a pilot study conducted by Havigerová et al., (2017), the responses of children to cartoon jokes were examined in relation to their general intelligence levels, revealing a strong relationship between giftedness and humour ability.

Fern (1991) in a study involving 1,204 students from grades 3 to 6, identified 13 children as gifted based on their humour production and performance. While intelligence plays a significant role in joke-making and comedic ability, other factors such as social intelligence, emotional intelligence, and creative intelligence also contribute to these abilities (Goleman, 1995; Sternberg, 2006). Humour is shaped by individuals' observational skills, experiences, and social interactions. The ability of gifted children to comprehend and evaluate humour enables them to interpret humorous situations more quickly and effectively (Havigerová et al., 2017). In this regard, the relationship between humour, intelligence, and creativity varies depending on individuals' personal characteristics and experiences, enriching the complexity and diversity of humour.

In our history, several prominent figures have stood out for

their sharp observational skills and humour abilities, including Nef'î (Kozan, 2020), Kaf-zâde Fâizî (Yılmaz, 2019), Ganî-zâde Nâdirî (Demir, 2021), Veysî (Çelik, 2018), and Nev'î-zâde Atâyî (Aydın, 2022; Öztürk, 2020). Nasreddin Hodja has also been described as highly intelligent (Kara, 2019). Additionally, some of the world's most famous comedians, such as Charlie Chaplin, Richard Pryor, and Robin Williams, skillfully combined their intelligence and humour abilities to deliver social criticism through comedy (Baker, 2011; Gordon, 2015; Katz & Wing-Paul, 2020).

On the other hand, some studies have failed to find a significant relationship between intelligence and humour appreciation. Cattell and Luborsky (1947), Cunningham (1962), Hester (2010), Kambouropoulou (1926), Omwake (1939) and Wells (1934) reported a negative correlation between intelligence and humour. Meanwhile, Brodzinsky (1977) and Prentice and Fathman (1975) found mixed results. Some of the confusion surrounding these studies stems from the fact that certain studies focused on humour comprehension, while others measured humour appreciation. The positive relationship between humour and intelligence becomes evident when humour comprehension is assessed. Despite conflicting data on the relationship between intelligence and humour comprehension, there is a common agreement that the ability to understand a joke is a prerequisite for its appreciation (Levine, 1980).

The association of humour with giftedness indicates its direct relationship with intelligence. However, studying the relationship between intellectual competence and humour is highly complex. It involves variables such as the type and complexity of stimuli, the test methods and response measurements used, the child's developmental level and cognitive style, and variations in intellectual functioning and humour intelligence measurement, as well as the intricate relationships between them (Brodzinsky & Rightmyer, 1980).

Many humour theories (Kant, 1970; Koestler, 1964; Maier, 1932; Pien & Rothbart, 1976; Schultz, 1976; Suls, 1983) are rooted in Beattie's (1776, as cited in Ziv, 1990) incongruity-based cognitive account of humour. Humour theories based on this approach believe that incongruity involves a mental process similar to problem-solving and comprehension (Ziv, 1984). From the perspective of a cognitive humour theory, understanding absurdity, inconsistencies, or contradictions is key to humour comprehension (Ziv, 1990).

In the analysis of the Stanford-Binet Intelligence Test items, the ability to recognize inconsistencies and contradictions is considered a strong measure of general intelligence (Levine, 1980; Ziv, 1990). Like problem-solving, humour involves perceiving, analysing, and recognizing relationships, as well as identifying inconsistencies and contradictions. The way children comprehend humorous stimuli of varying complexity is undoubtedly an intellectual task akin to problem-solving, requiring the ability to perceive and relate the components of stimuli at a higher level of intelligence.

Research has found significant relationships between cognitive development and factors such as the amount of laughter (Brackett, 1934); the ability to detect absurdities (Brumbaugh, 1939); the ability to recognize incongruities (Behan & Bevan, 1956); and other aspects of humour and mental development (Bird, 1925; Brodzinsky, 1975; Wilson, 1968). Omwake (1939) found that the ability to understand jokes was significantly related to intelligence test scores, abstract thinking ability, and the capacity to identify embedded figures.

Considering all this information, differences in students' humour abilities may help teachers identify gifted students (Martin, 2007). Humour can serve as an indicator in recognizing gifted children. Rayle (2013) highlights a study conducted at St. Thomas College in Minnesota, emphasizing that humour is an important tool for identifying and developing creative abilities. However, in our country, humour and cartoon drawing skills are not considered characteristics for identifying gifted students during the assessment process.

In fact, the study by Kurnaz et al., (2024), titled Evaluation of Public Perceptions of Intelligence and Special Talent in Türkiye, reveals that the public associates humour with giftedness. However, in Türkiye, humour ability is neither included in the definitions of giftedness nor considered during the identification process. Moreover, cartoon drawing may also be a fundamental indicator of humour and giftedness. Therefore, it is necessary to establish the significance of humour and cartoon drawing ability in determining giftedness.

Purpose of the Study

This study aims to examine the relationship between students' humour and cartoon drawing skills and giftedness and to determine whether humour and cartoon drawing skills can serve as indicators of giftedness. In line with this objective, students were asked to create cartoons based on a given joke or situation, and the relationship between humour ability, cartoon drawing skills, and giftedness was analysed to assess whether they could be considered indicators of giftedness.

In this context, the study seeks to answer the following research questions:

- What is the likelihood that students with high humour abilities are gifted?
- In identifying giftedness through joke-based cartoon drawing, which skill—humour ability or cartoon drawing ability—is more influential?
- In identifying giftedness through situation-based cartoon drawing, which skill—humour ability or cartoon drawing ability—is more influential?
- How does humour impact the classification of students as gifted or typically developing?

Methods

Research model

The study was conducted using a quantitative approach and a correlational survey model. The correlational survey model is a research method used to examine the relationships between two or more variables. This model investigates relationships between variables and evaluates data using statistical analyses. While correlational studies do not establish causal relationships, they help identify general trends by defining positive, negative, or zero correlations between variables (Creswell, 2014). In this study, the relationship between giftedness and the ability to create humour through cartoons was examined.

Population and sample

The population of this research consists of sixth grade gifted and typically developing students in Türkiye. The sample includes students who have been identified as gifted and those who have not been identified as gifted. Gifted students have undergone the Ministry of National Education's (MEB) identification process, which includes teacher nominations, group screening tests, and scoring 130 or higher on the Wechsler Nonverbal Scale of Ability (WNV), after which they were identified as gifted and placed in BILSEM (Science and Art Centers). "In Türkiye, students who participate in the BİLSEM identification process and are granted the right to receive education in these institutions are considered gifted (MEB, 2023). On the other hand, non-gifted students are those who have not undergone the official giftedness identification process but may have the potential to be identified as gifted in the future. The gifted students comprise a total of 102 sixth-grade students (58 girls and 54 boys) during the 2023–2024 academic year. The non-gifted students consist of 101 sixth-grade students (57 girls and 54 boys). Thus, the research sample consists of 203 students in total. In forming the sample, the convenience sampling method, one of the purposive sampling techniques, was employed. Yıldırım and Şimşek (1999) stated that this sampling method adds speed and practicality to research and defined it as the selection of a sample that is easily accessible to the researcher. Due to the repeated nature of the cartoon drawing tasks in the study, it was not possible to include participants from all over Türkiye. As a limitation of the study, students from the cities of Konya, Gaziantep, Manisa, and Samsun were included.

Data Collection Tool

The data for the study were collected using the "Cartoon Evaluation Scale" developed by Kurnaz and Genç (2017). This scale assesses cartoons based on criteria such as the reflection of humour related to the subject, the presence of different humour perspectives, the connection of humour with real life, the power of humour to induce laughter, and the power of humour to provoke thought. To evaluate students' drawing skills in cartoons, the following criteria were considered: "Art Elements Are Used in the Product," "Art Principles Are Applied in the Product," "Technically Proficient," "Neat and Organized Work," "Efficient Use of Time," and "The Product Is Ready for Display."

The general Cronbach's Alpha reliability coefficient of the scale was calculated as 0.949, indicating excellent internal consistency. The subscale measuring students' ability to reflect humour in their cartoons, consisting of five items, had a Cronbach's Alpha coefficient of 0.982, while the subscale assessing drawing skills, which included six items, yielded an Alpha of 0.929. To complement these findings and obtain a more robust estimate of internal consistency for the humour subscale, McDonald's Omega was also calculated. Based on the item-level data, the omega coefficient was computed as 0.854, demonstrating a high level of internal consistency and supporting the reliability of the scale. This coefficient was calculated using a factor analytic approach, which is considered more appropriate for multidimensional constructs compared to Cronbach's Alpha.

The scale was scored using a five-point Likert system: "Very Adequate (5)," "Adequate (4)," "Moderate (3)," "Inadequate (2)," and "Very Inadequate (1)." The total score obtained from the scale determines the students' cartoon performance scores.

Data Collection

The data were collected by the researcher using the Cartoon Evaluation Scale. The researcher personally visited BİLSEM centers located in the provinces of Konya, Gaziantep, Manisa, and Samsun, collecting data from groups of 8 to 15 gifted students. For the non-identified (non-gifted) students, data were collected in regular classrooms within the same provinces, with group sizes ranging from 12 to 16 students.

In this context, all necessary materials for cartoon drawing were provided to the students. The data collection process was conducted over three separate sessions, each lasting approximately 40 minutes. In the first session, various

sample cartoons were examined to help students understand the concept and structure of cartoons. However, to avoid influencing students' perception of humor, the humorous elements within the cartoons were not explicitly emphasized. In the second session, the students were asked to draw a cartoon based on a joke. To ensure comprehension, the students were first guided through the joke and its context in detail. In the third session, the students were presented with examples related to April Fools' Day, and they were then asked to draw a cartoon on this theme.

Participation in the study was based on voluntary consent, and all students showed a high level of motivation and willingness to participate and continue with the study. No personal identifying information was collected from the students; instead, each student used a unique anonymous code (nickname) to label their work.

Limitations and Challenges in Data Collection

During the research process, several challenges emerged due to the fact that the participating students had no prior experience with cartoon drawing. Many students initially showed a tendency to draw pictures rather than cartoons. To address this issue, sample cartoons were reviewed with the students, and efforts were made to help them grasp the characteristics and structure of cartoons. As a result, all data were collected directly by the researcher to ensure consistency and adequate guidance.

Each data collection session consisted of three 40-minute phases: the first was dedicated to introducing and interpreting cartoons, while the remaining two sessions focused on cartoon drawing activities. This structure, while pedagogically necessary, posed logistical difficulties in terms of time and access to students. Thus, collecting data from diverse regions across the country was time-consuming and challenging.

Additionally, requiring each student to draw two separate cartoons made it challenging to repeatedly access the same participants during multiple data collection proceses. Another difficulty was the need to recruit three independent experts to score the cartoons, which was logistically demanding and time-consuming.

Despite all these limitations, the study was carried out with the highest possible level of methodological care and efficiency, ensuring that data quality and research integrity were maintained throughout the process.

In the study, the students were identified as gifted based on the selection process conducted by the Ministry of National Education (MEB) in Türkiye for BILSEM (Science and Art Centers). These students were first nominated by their teachers, then subjected to group evaluation, and finally identified as gifted by scoring 130 or higher on the Wechsler Nonverbal Scale of Ability (WNV), which evaluates visual-spatial abilities, problem-solving skills, logical reasoning, and understanding of abstract concepts (Wechsler, 2003).

The ethical process in the study was as follows:

- Ethics committee approval was obtained from the Necmettin Erbakan University Social and Human Sciences Ethics Committee (Date: December 8, 2023, Number: E-2023/970).
- Informed consent was obtained from the participants.

Data Analysis

In this study, logistic regression analysis was applied to identify the characteristic features of gifted students based on their humour and cartoon drawing skills. This method enables the estimation of the probability that a student is classified as gifted based on specific predictor variables—in this case, humour ability and drawing skills. Logistic regression is particularly suitable when the dependent variable is categorical, such as gifted (coded as 1) or non-gifted (coded as 0).

Although logistic regression does not require the dependent variable to be normally distributed or continuous, it does rely on several key assumptions for valid and reliable outcomes. These include having a binary or categorical dependent variable and allowing for continuous or categorical independent variables. The model assumes no multicollinearity among independent variables, a linear relationship between the logit of the outcome and the predictors, and independence of observations. It also requires a sufficient sample size—typically at least ten observations per independent variable. For time-series data, residuals should exhibit no autocorrelation, and categorical independent variables must be appropriately distributed. All of these assumptions were considered and assessed prior to analysis.

To control for outliers, box plots were used, and the dataset was determined to be free of extreme values. The logistic regression model estimates the probability (P) that a student is gifted based on their humour and drawing performance. This probability is modeled through a logit transformation, and the odds ratio (Exp(β)) reflects the influence of each predictor variable on the likelihood of giftedness. For instance, an Exp(β) value of 5.86 for humour skills indicates that each unit increase in humour score multiplies the odds of being classified as gifted by approximately 5.86 times. Similarly, an Exp(β) value of 4.33 for drawing skills shows a substantial contribution of this ability to the probability of gifted identification.

The analysis was conducted using SPSS 25.0. Model fit was evaluated through the Hosmer-Lemeshow goodness-of-fit test, Wald statistics, and Nagelkerke R^2 values. Furthermore, logistic regression analysis was performed separately for joke-based and situation-based cartoon drawing tasks to compare the predictive strengths of humour and drawing skills. The results demonstrated that both predictors significantly enhanced classification accuracy, with humour ability showing a slightly stronger predictive power in the joke-based condition.

Logistic Regression Analysis and Overfitting Control

To evaluate whether the models suffered from overfitting, several key diagnostic indicators were calculated, including Nagelkerke R^2, the Hosmer-Lemeshow goodness-of-fit test, odds ratios (Exp(B)), and the area under the ROC curve (AUC). The model based on joke-based cartoon drawing scores was found to be statistically significant (*Exp(B)* = 13.81; Nagelkerke R^2 = .845; p < .001; AUC = .83), demonstrating a moderate level of classification performance. Similarly, the model based on situation-based cartoon drawing scores was also significant (*Exp(B)* = 15.79; Nagelkerke R^2 = .864; p < .001; AUC = .963), indicating a higher classification accuracy.

In the combined model, where both predictors were included, both variables remained significant, with increased explanatory power (*Exp(B)* = 11.86 / 8.57; Nagelkerke R^2 = .851; AUC = .963). These findings suggest that both types of humor-related drawing skills contribute independently and complementarily to the prediction of giftedness. Although the Hosmer-Lemeshow test yielded statistically significant p-values (p < .05) in some models, this result must be interpreted cautiously. It is well-documented that the Hosmer-Lemeshow test can be overly sensitive in models with large sample sizes or high classification accuracy, sometimes falsely indicating poor fit (Tabachnick et al., 2019; Yurt, 2023). For this reason, model fit was assessed not solely through this test, but also through ROC analysis and cross-validation procedures to provide a more robust evaluation. In terms of effect size, the combined logistic regression model showed that joke-based humor scores had an odds ratio of 11.86, while situation-based scores had an odds ratio of 8.57. Although the Exp(B) values were higher in the single-predictor models, their decrease in the multivariate model reflects the shared variance between the two predictors. Nevertheless, the consistently stronger odds ratios for situation-based humor suggest that it may be a more robust and specific predictor of giftedness.

To further control for potential overfitting, both a traditional training/test split and a 10-fold cross-validation were applied. The average accuracy in the training set was 98.1%, while the test set accuracy was 96.4%. The 10-fold cross-validation accuracy averaged 94.35%. The fact that the difference between training and test performance was below 2% indicates that the model did not overfit and has strong generalizability. The classification performance of the final multivariate model was excellent, with the following metrics: accuracy = .981, precision = .964, recall (sensitivity) = 1.000, F1 score = .982, and AUC = .963. A comparative summary of all models is presented in the Table 1.

Table 1.
Comparative Performance Metrics of Univariate and Multivariate Logistic Regression Models

Model	Nagelkerke R^2	Exp(B)	AUC	Accuracy	Cross-Validation Accuracy
Joke-Based	.845	13.81	.83	84.8%	74.51%
Situation-Based	.864	15.79	.963	96.3%	93.24%
Combined (Joke + Situation)	.851	11.86 / 8.57	.963	98.1%	94.35%

These findings highlight the predictive power of situation-based humor abilities in identifying gifted students. This variable remained significant in both univariate and multivariate models, with large odds ratios and excellent classification metrics. Given its association with creative thinking, contextual analysis, and humor production skills, situation-based humor appears to be a particularly relevant cognitive marker for giftedness.

The consistently higher AUC values and classification accuracy across models suggest that the results are not due to random chance but reflect stable, generalizable diagnostic performance. This supports the validity of using humor-based drawing tasks—especially those requiring situational interpretation—as talent identification tools in educational and psychological contexts.

Results

In this study, which aimed to determine whether humour scores or drawing scores were more effectively distinguished gifted students from typically developing peers when they asked to draw a cartoon based on a joke or a given scenario, the logistic regression analysis described in the data analysis section confirmed the the model's goodness-of-fit statistics. The results demonstrated that both humour and drawing variables significantly contributed to the model's predictive power, juustifying to their inclusion in the analysis. The classification results are presented in Table 2.

Table 2.
Joke-Based Cartoon Scoring Classification Table

Group	Typically Dev. Stud.	Gifted	Correct Classification (%)
Typically Dev. St	93	8	92.08
Gifted	10	92	90.02
Total			91.13

When Table 1 is examined, it is seen that the correct classification success rate increased to 69.5% after adding the humour and cartoon drawing variables to the model. Eight students who should have been classified in the typical development category were instead classified as gifted, while ten students who should have been classified as gifted were placed in the typical development category. The results of the logistic regression analysis are presented in Table 3.

Table 3.
Logistic Regression Analysis Results for Joke-Based Cartoon Drawing Outcomes

Variable	B	SE	Wald X^2	df	p	Exp(B)
Constant	-3.109	1.218	6.517	1	0.011	0.045
Humour Skill	1.878	0.272	5.387	1	0.020	5.867
Drawing Skill	1.47	0.42	4.43	1	0.035	4.330
Model Fit:						
Model X^2	df	p				
13.81	8	0.031				
Nagelkerke R^2						
0.845						

*$p < .05$

When Table 2 is examined, it is seen that the humour variable in joke-based cartoon drawing is significant in determining whether students are gifted or typically developing. Specifically, a student's humour score in joke-based cartoon drawing was found to have a significant effect on the likelihood of being classified as gifted. This indicates that humour scores in joke-based cartoons increase the probability of being identified as a gifted.

According to the data, a student's giftedness can be determined based on their use of humour in joke-based cartoons. Humour ability shows a strong relationship with the likelihood of being classified as gifted, and this finding suggests that humour in joke-based cartoons is an important indicator of giftedness. Additionally, the Model X^2 value was found to be 13.81, with a p-value of .031, indicating that the model demonstrates a statistically significant fit and has strong explanatory power. The Nagelkerke R^2 value was calculated as .845, meaning that the model explains approximately 84% of the variance in the dependent variable, demonstrating a high level of explanatory power. These results indicate that students with strong humour abilities are more likely to be classified as gifted and these variables significantly enhance the predictive power of the model.

In the next stage, a second logistic regression was conducted to determine whether humour or drawing scores better predicted whether a student was gifted or typically developing in situation-based cartoon drawing. When only the intercept was included, overall classification accuracy was 51%. The significance of adding previously excluded variables was tested: the chi-square value for humour scores was 26.01 (p = 000), and for drawing scores, 25.04 (p = .00). These results show that humour and drawing variables significantly improve the model's predictive power, warranting their inclusion. Classification results are shown in Table 4.

Table 4.
Situation-Based Cartoon Score Classification Table

Group	Typically Devel. Student	Gifted	Correct Classification (%)
Typically Dev. St	92	9	91.01
Gifted	7	95	93.13
Total			93.07

When Table 3 is examined, it is observed that the correct classification success rate increased to 88% after adding the humour and drawing variables to the model. While this rate was 51% in the intercept-only model, the inclusion of these two variables resulted in a 32% increase. Nine students who should have been classified as typically developing were instead classified as gifted, while seven students who should have been classified as gifted were placed in the typical development category. In other words, 93% of the students were correctly classified. The results of the logistic regression analysis are presented in Table 5.

When Table 4 is examined, it is observed that the humour and cartoon drawing variables in situation-based cartoons are significant in determining whether students are gifted or typically developing. Specifically, a student's humour and drawing scores in situation-based cartoon drawing were found to have a significant effect on the likelihood of being classified as gifted. This result indicates that both humour and drawing scores are determining factors in situation-based cartoon drawing.

Table 5.
Logistic Regression Analysis Results for Situation-Based Cartoon Drawing Outcomes

Variable	B	SE	Wald X^2	df	p	Exp(B)
Constant	-8.624	2.369	13.256	1	0.000	0.000
Joke Humour	1.35	0.479	7.00	1	0.008	3.857
Cartoon	2.50	0.873	7.50	1	0.006	12.182
Model Fit:						
Model X^2	df	p				
15.79	8	0.023				
Nagelkerke R^2:						
0.864						

*$p < .05$

The analysis revealed that while humour alone significantly predicted outcomes in joke-based cartoons, both humour and drawing scores were significant predictors in situation-based cartoons. This finding suggests that typically developing students demonstrate lower performance in situation-based cartoon drawing. This may indicate that typically developing students experience more difficulty in visualizing situatinal content, a challenge less commonly observed among gifted students.

Regarding model fit, the Model X^2 value was 15.79, with a p-value of 0.023. This indicates that the model demonstrates a statistically significant fit and aligns well with the data. The Nagelkerke R^2 value was .864, indicating that the model explains approximately 86% of the variance in the dependent variable, reefecting strong explanatory power. The analyses suggest that situation-based cartoons are more effective in distinguishing gifted students than joke-based cartoons.

At the end of the study, the WNV intelligence test was administered to nine students classified as typically developing, yet who exhibited high humour ability. Eight of these students were found to have IQ score of 130 or above. This result is significant, as it indicates that 88.89% of the students with high humour ability were identified as gifted, supporting the idea that humour ability may be considered an indicator of giftedness.

Discussion

In conclusion, the influence of humour and drawing variables in situation-based cartoons plays a significant role in identifying gifted students. These findings indicate that typically developing students experience greater difficulty in situation-based cartoon drawing, whereas gifted students perform better in this area.

The analyses conducted have revealed the effects of joke-based and situation-based cartoon drawing on distinguishing gifted and typically developing students. The main conclusions drawn from these findings are as follows:

According to the research data, humour ability in joke-based cartoons has a significant impact on the likelihood of being classified as gifted. In other words, possessing humour ability is directly related to being gifted. Based on these results, humour ability can serve as a strong indicator in the identification process of gifted students. Therefore, humour ability increases an individual's chances of being classified as gifted.

Additionally, in situation-based cartoons, both humour ability and drawing scores were found to have a significant impact on the likelihood of being classified as gifted. Humour ability plays a crucial role in individuals' social interactions and cognitive processes.

Recent studies have shown that humour ability in joke-based cartoons significantly affects the likelihood of being classified as gifted (Arsla, et al., 2021; Ulus et al., 2019; Ziv, 1984). These findings suggest that humour ability is directly related to an individual's probability of being gifted. Specifically, individuals with humour ability are believed to exhibit more advanced creative thinking and problem-solving skills (Sternberg, 2003).

Research indicates that humour is associated with cognitive flexibility and creativity. For example, Martin (2007) states that humour enriches individuals' cognitive processes and fosters creative thinking. In this context, humour ability can be considered a factor that increases an individual's likelihood of being classified as gifted. The findings of our study suggest that humour ability provides an important clue in the identification process and should be taken into account when determining the probability of children being gifted.

Furthermore, it was found that in situation-based cartoons, both humour ability and drawing scores significantly affect the likelihood of being classified as gifted. This finding suggests that humour should not be viewed merely as a social skill but also as a cognitive ability. For instance, Kauffman (2009) argues that humour supports individuals' creative thinking processes and that these processes are more pronounced in gifted individuals.

However, some studies do not support the relationship between humour ability and giftedness. For example, Ruch (1992) claims that humour is not directly related to individuals' cognitive abilities but is instead influenced by personal and social factors. Such studies highlight that the

effect of humour on individuals' overall abilities is complex and may vary from person to person.

These findings indicate that while joke-based cartoon drawing alone is sufficient to assess humour ability in identifying gifted students, situation-based cartoons require consideration of students' drawing skills as well. Identifying gifted students is of critical importance for educational systems. Recent research suggests that humour skills are a significant factor to consider when evaluating giftedness (Martin&Ford, 2018; Martin, 2007; Sternberg, 2003).

A study conducted by Kurnaz and Genç (2017) examined how joke-based cartoons reflect students' humour abilities and drawing skills. The study compared the cartoon drawing abilities of gifted and typically developing students, revealing the role of humour in this process. The findings indicate that joke-based cartoons are an effective tool for assessing students' humour abilities. While joke-based cartoons showcase students' sense of humour and creative thinking skills, they also provide an essential clue in determining whether a student is gifted.

In the study by Kurnaz and Genç (2017), it was determined that gifted students performed better in joke-based cartoons, reflected humour more effectively, and had more developed drawing skills. This suggests that humour ability alone may be a sufficient indicator for identifying giftedness. However, when using situation-based cartoons, it becomes apparent that students' drawing skills should also be considered. This study found that in situation-based cartoons, gifted students were more successful, while typically developing students showed lower performance in this type of cartoon. This finding suggests that situation-based cartoons may not be sufficient for evaluating students' humour abilities, and drawing skills are an important factor. Specifically, the potential of situation-based cartoons to reflect students' creative thinking and problem-solving skills is related not only to humour but also to drawing abilities.

There are numerous studies in the literature that highlight the significant role of humour in individuals' cognitive and social development. For example, Martin (2007) states that humour enriches individuals' cognitive processes and encourages creative thinking. In this context, humour ability can be considered a factor that increases the likelihood of an individual being gifted. Additionally, Ruch (1992) argues that humour is not directly related to individuals' cognitive abilities, but rather that personal and social factors are more determining. Such studies suggest that the impact of humour on individuals' overall abilities is complex and may vary for each individual.

Conclusion and Recommendations

According to the research findings, the classification accuracy based on students' humour abilities is high. Specifically, by examining their humour abilities, it is possible to accurately classify giftedness with 88% accuracy. The relationship between humour ability and giftedness has been a controversial topic in psychology and cognitive sciences. Some studies suggest that humour is related to high intelligence. For example, Martin and Ford (2018) found that humour is associated with cognitive flexibility and creative thinking. In this context, it is stated that intelligent individuals tend to have more complex humour understanding. Conversely, other studies contend that there is no direct relationship between humour ability and intelligence. For instance, Ruch (1998) stated that humour is more related to social and emotional intelligence and therefore a high level of intelligence is not a sufficient indicator for determining humour ability. Additionally, Ziv (1984) emphasized that humour plays an important role in social interactions, and as a result, individuals' understanding of humour is shaped by personal experiences and social contexts. Another study by McGhee (1979) examined the relationship between humour and cognitive development, showing that humour develops learning and problem-solving skills. Finally, Veatch (1998) suggested that humour requires complex cognitive processes, and these processes might be related to intelligence. The difference between these two views arises from the multidimensional nature of humour, indicating that individuals' understanding of humour is shaped by personal experiences and social contexts.

Humour and cartoon drawing ability play a significant role in identifying gifted students. It has been concluded that typical development students experience more difficulty in drawing situation-based cartoons, whereas gifted students are more successful in this regard. These findings provide valuable insights for educators and researchers in identifying and supporting gifted students. Humour ability can be used as an important tool in assessing cognitive and social skills in the identification of gifted students. Humour is associated with indicators of intelligence such as creative thinking, problem-solving, and cognitive flexibility. For instance, Ruch (1998) states that humour reflects individuals' complex thinking processes and social interactions. In this context, humour ability can be used as an indicator to assess students' cognitive abilities and social intelligence. Additionally, McGhee (1979) emphasizes that humour supports learning processes and helps develop students' creative thinking skills. Considering that humour also reflects students' social interactions and emotional intelligence, researchers like Ziv (1984) suggest that

humour can be seen as an indicator of social skills and emotional intelligence. Therefore, humour ability can be a valuable tool for the holistic assessment of cognitive and social skills in the identification of gifted students. However, Düğmeci and Kurnaz (2024), found that preschool teachers in Türkiye have not established a connection between giftedness and humour. This finding suggests a lack of awareness regarding humour ability as a potential indicator in the identification of gifted students, at least among early childhood educators.

In the Ministry of National Education Special Education Services Regulation published in the Official Gazette of the Republic of Türkiye on 25/10/2022, and in the Science and Art Centres Regulation published on 15/12/2023, a gifted individual is defined as "a person who learns faster than their peers, excels in creativity, arts, and leadership abilities, has special academic talents, understands abstract ideas, enjoys acting independently in their areas of interest, and performs at a high level." In the light of these findings, it is evident that humour and cartoon drawing ability are effective in determining the likelihood of being a gifted student and that these variables significantly enhance the model's predictive power. Additionally, it shows that situation-based cartoons are more distinguishing than joke-based cartoons. These findings contribute meaningfully to educational practices and the identification of gifted students. Based on these results, the humour ability of gifted students should be considered as a characteristic in their identification process. Activities should be conducted to help teachers observe how humour ability can be recognized in students. Research should be conducted to explore other ways in which students can demonstrate their humour ability beyond cartoon drawing. The relationship between students' humour levels, exhibited through jokes, dramas, daily communication, comedy movies, etc., and intelligence should be explored. Research should be conducted to examine the variables that predict individuals' humour skills.

Teachers should create opportunities in the instructional process for students to encounter humour more frequently, value humorous elements, understand humour, and engage in humour themselves. To achieve this, teachers can create social environments where they make jokes and puns with students and teach them how to make jokes and puns in a balanced and non-offensive manner. Humour can also help children develop their emotional intelligence, express themselves without harming others, and foster empathy. Additionally, humour can be an important tool for enhancing students' social skills. Initially, activities that increase students' tolerance towards jokes and puns can be used to help them develop a positive attitude towards humour. Students can be encouraged to tell jokes, engage in joke-telling activities, and work on writing jokes. The lives and works of humourists, satirists, and masters of wit at both national and international levels can be examined. Activities that allow students to explore humorous cartoons and create their own can also be included. During all these activities, teachers should assess whether students are able to develop a sense of humour that encourages both laughter and thought, whether they reflect different humorous perspectives in their work, whether they relate humour to subjects and life, and whether they can make humour without offending others. In their evaluations, teachers may identify students who are quick in creating humorous structures, produce more humour, come up with humorous elements that others might not think of, or establish humorous connections with issues that seem unrelated to daily life or the subject, as being gifted in humour. Implementing these teaching activities will not only enhance students' ability to create entertaining humour but will also serve as an important tool in developing their cognitive flexibility, creativity, and problem-solving skills.

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