The Application of Graphology in Assessing Deaf People's Communication and Social Interaction Abilities

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Graphology, the study of handwriting, has been used to interpret an individual's character and personality. This study examined the application of graphology in assessing the communication and social interaction abilities of deaf people. Deaf individuals face challenges in building social relationships and communicating with others because of their hearing impairment and reliance on nonverbal communication techniques such as sign language. Previous research has explored the potential of graphology in diagnosing attention deficit hyperactivity disorder (ADHD) and mental retardation as well as in revealing the psychological aspects of historical figures. However, few studies have investigated the application of graphology in assessing the counseling needs of deaf individuals. This study employed a qualitative approach to analyze the handwriting samples of deaf participants using graphological techniques. The findings revealed that intensifying and reducing signs in the handwriting of deaf individuals influenced their communication and social interaction abilities. This study highlights the potential of graphology as an alternative assessment tool for understanding the characteristics and conditions of deaf individuals, without relying on oral communication. These results contribute to the field of counseling by providing insights for assessors, such as psychologists and counselors, to develop appropriate interventions and approaches tailored to the unique needs of deaf individuals. Further research is recommended to explore the effectiveness of graphology-based interventions in enhancing communication and social interaction skills of deaf individuals.

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Public Interest Statement

Deaf people tend to engage in social interactions and communicate verbally. However, the limitations described by the indicators of the intensifying and reducing signs in graphology influence these abilities. Thus, graphology can be used as an alternative assessment tool for deaf people. We believe that these findings have an important contribution for assessors such as psychologists and counselors to know the characteristics and conditions of special populations such as deaf people who communicate without involving oral communication, reduce the duration of observation of deaf people, and be able to provide appropriate interventions or approaches to deaf people.

Introduction

Counseling as a helping profession, including for a special population, should be provided to everyone. People with similar dynamics or general problems, and especially different psychological backgrounds, from other people (Lesmana, 2021). In line with the code of ethics of the Guidance and Counseling profession, it is explained that the provision of counseling services by counselors does not consider differences in ethnicity, nation, skin color, religion, or socioeconomic status; counselors are also obliged to provide services to anyone, especially in emergency conditions or when many people are in need (Indonesian Guidance Counseling Association No. 10 of 2006).

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This service is naturally provided to facilitate the development of an individual or group of individuals towards their potential abilities and to help overcome the weaknesses or obstacles faced in their development (Wibowo, 2018). Deaf people are part of a special population characterized by obstacles in the ability to hear sounds and language, partly or wholly due to the malfunction of hearing ability in aspects of language and speech development (Susetyo et al., 2023)

Nonverbal communication techniques in counseling focus on conveying certain intentions to the counselor during service delivery, as expressed by the counselor (Sumarto & Harahap, 2020). Meanwhile, deaf people communicate using sign language with the Indonesian Sign Language System (SIBI) and Indonesian Sign Language (BISINDO) (Isma, 2018). Deaf people are unable to build social relationships and have difficulty communicating with others (Hidayat et al., 2022). Therefore, treatment methods that are in accordance with the characteristics of deaf people are needed (Nofiaturrahmah, 2018). In particular, a long observation period is needed to obtain information about their characteristics, such as interests, talents, strengths, and weaknesses (Anggara & Wagino, 2018).

The difference in communication methods and difficulty in building social interactions attracted the author's attention to collecting information on deaf people without involving oral communication. One of the assessments that can be performed is utilizing the science of graphology by analyzing handwriting as the instrument used. In Western European countries, especially Australia, graphology is recognized by the High Court. It is used as a data source to analyze crime cases. This is accomplished by studying the graphic movements of handwriting, doodles, drawings, and paintings (Dwikardana et al., 2019). However, most analysts concentrate on analyzing handwriting by measuring spontaneity and nonverbal communication in writing that comes from a person (Wahyuni, 2018). In the context of counseling guidance in Indonesia, the application of graphology has only been held in training teachers to recognize students' personalities through handwriting (Wibowo, 2022).

Handwriting is used as an instrument to conduct personality assessments, which are assumed to reflect a person's personality (Siswanto, 2012). Assessments are carried out with the aim of gathering information that allows for the determination of the problem and an understanding of the background and situation that exists in the counselee's problem (Safithry & Aryani, 2018). In an effort to understand or determine the diagnosis experienced by individuals regarding the stage of learning, weaknesses, and skills, as well as matters relating to a person's behavior (Hasri & Permadi, 2023).

Previous research on the application of graphology has been conducted in children with attention deficit hyperactivity disorder (ADHD) and mental retardation. Results showed that graphology can be a potential tool that can be used in diagnosing the disorder (Cohen et al., 2019). Awareness of the benefits of graphology, other research has been conducted on the design of technology to facilitate analysts in analyzing handwriting (Ghosh et al., 2020). In a historical study, the results of graphological findings can reveal the psychological side of a historian's personality by comparing the results of graphological analysis with the literature on historians (Fauzi & Yulianti, 2022).

Based on previous research, there are differences with this research, namely in the application of graphology as an assessment of deaf people's counseling needs. In addition, there are striking differences in various aspects in terms of the object studied, the approach used, the analysis techniques, and the results of understanding the behavior and character of individuals through handwriting analysis (graphology) and taking different steps by applying graphology to the aspects of communication and social interaction of deaf people, opening new ways to understand the communication of deaf people.

This research is important for increasing our understanding of how deaf people express themselves through their writing. It does not discuss the characteristics and forms that exist in writing, but rather aims to help build better and more inclusive communication methods and approaches according to each individual's condition. Based on this description, this study aimed to examine the application of graphology to deaf people. The problem formulation in this study concerns how the application of graphology can be used to assess the communication and social interaction skills of deaf people. In addition to the output of the handwriting analysis results, both of these aspects.

Literature Review

1.1 Graphology
According to Michon (1884), the term "graphology" was introduced to describe the study of handwriting (Musman, 2019; Siswanto, 2012). Graphology is a branch of science that interprets a person's character and personality through handwriting (Fadhilla et al., 2017; Siswanto, 2012). Linguistically, the word graphology comes from Greek, namely "grapho" which means writing, and "logos" which means a branch of scientific study. According to Dwikardana (2019), handwriting is the result of an individual's conscious and subconscious thoughts that reflect and describe his character. According to Lestari and Laksono (2022), handwriting has a unique and different pattern (Ludvianto, 2020).

It is from handwriting that a person can know their strengths and weaknesses so that it can be used as a means of identifying a person's nature, character, mental development, and health level (Lestari & Laksono, 2022). The accuracy of using graphology reaches 80–90%; thus, it is accurate and effective for reading a person's character or character. In providing analysis, graphology has several reading angles from the category of handwriting forms, such as the slope, pressure, size, and distance of writing. Each category of handwriting has a different personality and character (Ludvianto 2020).

1.2 Communication

According to Soekanto (2018), communication is the way a person interprets the behavior of others in the form of speech, gestures, or attitudes, and what feelings the person wants to convey. Communication is a complex activity because in addition to being related to language and speech skills, it is also influenced by the nervous system, understanding or cognitive abilities, and social abilities. Communication is a process in which an individual transmits a stimulus to change the behavior of another individual. Communication is one of the ways that all living things convey their emotions more easily, and there are various types of communication, such as verbal and nonverbal communication (Yudowati & Lumajang, 2021).

Verbal communication is performed using language, which is one of the most important communication tools. However, language is closely related to the understanding and use of words and includes all forms of communication, including oral, written, sign language, body language, and facial expressions. Wiryanto (2014) defines communication, namely "The process by which an individual (the communicator) transmits stimuli (usually verbal symbols) to modify the behavior of other individuals." There are various forms of communication besides language that deaf children can use.

There are three stages in the communication process: first, encoding is the communication of an idea through sentences or images; second, the delivery of ideas through sentences and images in the form of oral, written, or a combination of the two; and third, decoding is the absorption or understanding of what has been conveyed. Communication can be done with anyone and at any time without distinguishing between rich or poor, educated or not, and normal or special needs such as deaf (Rustamaji & Harsiwi, 2024).

According to Marschark and Spencer (2016), two types of communication can be used with deaf children. Non-logistic communication: Communication that does not use oral/oral and uses many facial expressions, body gestures, body movements, and physical activities. Logistic communication is communication using lip language, where one individual speaks using their mouth and uses language that is understood. Muhammad (2022) also said that one-way deaf people can communicate more easily is by using sign language or non-verbal communication because sign language helps them convey what they want to say.

1.3 Social interaction

Social interaction is a dynamic social relationship that relates to the relationship between individuals, groups, groups, and individuals within groups (Travelancya, 2022). In line with Soekanto's (2018) sociological perspective, social interaction is a dynamic social relationship involving relationships between individuals, groups, and individuals and groups. According to Bonner, social interaction is a relationship between two or more individuals in which each individual's behavior can influence, change, and improve the behavior of other individuals. According to Soekanto (2009), social interactions must include the following two components: linguistically, social contact is a mutual touch or together touching each other; however, in a sociological sense, this physical touch is not an absolute requirement for social interaction. There are also social interactions that are formed without physical interaction, such as communication via the telephone or other electronic media. Communication is an understanding of the behavior and feelings conveyed by the opposite communication (the communicator).

According to Rachman (2022), psychological factors affect social interaction. Imitation is the act of imitating others in various forms such as speech style, behavior, customs and habits, mindset, and whatever a person has or does. Suggestion occurs when the recipient is unable to think rationally in a non-neutral situation. Identification is a person's tendency to be the same as that of the other party. Its nature is deeper than imitation, because it shapes a person's personality and can occur intentionally or unintentionally. Sympathy is the process through which a person feels attracted to another person. Empathy is deep sympathy that can affect a person physically and psychologically. For example, a mother may feel lonely when her child goes to school outside the city and misses thinking about him, so he falls ill.

1.4 Deaf people

According to Fajar Wahyu Nugroho (2023), the deaf are someone who is not or less able to hear sounds. According to Rustamaji and Harsiwi (2024), deaf children experience hearing loss that makes them unable to hear, ranging from

mild to severe actions, and they are considered deaf or hard of hearing. Deaf children have mild to severe hearing loss, where total hearing loss or deafness (deaf) and partial hearing loss or hard of hearing are two types of hearing loss known as deafness accompanied by speech impairment, that is, inability to speak (Rahayu et al., 2023).

According to Hallahan and Kauffman, deafness (hearing impairment) is the inability to hear from mild to severe, and is classified as a deaf person who is unable to hear, so that he/she experiences obstacles in obtaining language information processing through hearing. The rest of his hearing is sufficient to allow for the success of processing language information through hearing, meaning that if a person who lacks hearing aids uses them, he still captures the conversation. According to Soewito (2019), someone who experiences severe-to-total deafness cannot capture speech without reading the lips of the interlocutor.

Some of the definitions of deafness above are complex, so it can be concluded that a deaf child has hearing loss, either completely or still has residual hearing. Although deaf children are provided with hearing aids, they still require special education. Jannah and Gumelar (2024) mentioned that the limitations of deaf people have caused them to be closed and feel unable to socialize with others.

Materials and Methods

This study uses descriptive and qualitative approaches. Qualitative research using a descriptive approach begins by grouping the same data and then interpreting them to give meaning to each aspect and its relationship (Pahleviannur et al., 2022). This method allows researchers to explore in detail how handwriting characteristics descriptively describe aspects of an individual's personality and emotions. This method provides flexibility in using data-collection techniques that may be missed in quantitative approaches. The data collection techniques used were observation, interviews, and documentation. Observations were conducted to measure certain aspects of feedback on these measurements (Hasan et al., 2022). Furthermore, interviews were conducted between researchers and handwriting analysts to gather information and obtain a detailed and extensive in-depth understanding of the research objectives (Nasution, 2023). Documentation studies are qualitative data collection techniques that view and analyze related documents in the form of writing, pictures, diaries, life histories, regulations, policies, or monumental works (Nasution, 2023). Thus, this approach allows for more in-depth theoretical development on how handwriting can be used to assess deaf people.

The data collection technique was carried out using a procedure that started by determining suitable participants, namely deaf people from one of the Special Schools (SLB) in Medan City. The participants had hearing and speech impairments and were aged 15–22 years. After determining the appropriate participants, instructions were given to the participants to freely write down any experiences experienced on a sheet of A4 plain paper with the same type of pen that had been provided. In delivering the instructions, the homeroom teacher assisted the researcher in communicating the intention of the researcher to the participants. The participants were given time to write after the completion of the writing, which was used as a sample, and were sourced from five students who will hereafter be referred to by their initials: AMS (19 years), JM (15 years), N (17 years), RCT (15 years), and ST (22 years).

Handwriting, which is the source of the data, was collected and submitted to Winny Asriyani, S.Pd, CHA handwriting analyst, who is competent in her field as an informant in explaining the results on the aspects of communication skills and social interaction of each individual. Then, graphological analysis is carried out by paying attention to various signs, such as shape, slope, large or small writing, distance in writing, and margins. Each sign in the writing is included in the indicators. These signs are known as major traits (the main indicators that represent abilities in certain aspects), intensifying traits (signs that represent positive indicators in adding or supporting the ability of major traits), and reducing traits (signs that represent negative indicators in reducing the ability of major traits).

The data obtained from the informants were explained using taxonomic data analysis techniques. This technique breaks down a selected domain in more detail to determine its internal structure (Hasan et al., 2022). For taxonomic analysis, data from the observations, interviews, and documentation studies were transcribed and coded according to the research objectives. Furthermore, researchers conducted further classification or categorization by applying graphology as an assessment, reading signs and indicators in graphology in aspects of communication and social interaction, and interventions for deaf people based on the results of the graphological analysis. Interviews were conducted with analysts to explain certain results and meanings based on the results of the handwriting analysis. The study of graphology analysis reports on deaf people can also provide in-depth insights into their communication and social interaction skills.

The credibility and validity of the data used in this study were based on data-source triangulation. According to Wiersma (2019), triangulation is a qualitative cross-validation method that assesses the adequacy of data according to the convergence of several data sources or several data collection procedures. Simply put, this means checking data

from various sources in various ways and times. Data processing was conducted to compare data sources from interviews, observations, and documentation studies on the results of the graphological analysis with the psychological behavior of deaf people on the aspects studied with relevant research. Integrating data from interviews can provide context and a deeper understanding of what is observed in observations, whereas documentation studies can provide a supporting perspective. Thus, triangulation ensures that the findings obtained not only come from one data source but are supported by a variety of different methods and sources.

Results

Further classification or categorization based on interview data for analysts is shown in Table 1. Table 1 includes the codes for each question (Q) and answer (A) in the interview as well as the category or topic relevant to each question.

Table 1. Analysis of interview data for graphology analysis

Code	Interview Data	Interpretation
Q1	To collect data related to my current research, I need some data from you as a graphology analyst. Just for the first question, how can graphology be used as an assessment of the deaf?	On the use of graphology as an assessment for the deaf.
A1	Graphology comes as an alternative to see how a person expresses thoughts and responses through his writing, into certain strokes which in the end the strokes do indicate a meaning related to personality character.	Explains that graphology can be used to see deaf children's expression of thoughts through handwriting.
Q1	To collect data related to my current research, I need some data from you as a graphology analyst. Just for the first question, how can graphology be used as an assessment of the deaf?	On the use of graphology as an assessment for the deaf.
A1	Graphology comes as an alternative to see how a person expresses thoughts and responses through his writing, into certain strokes which in the end the strokes do indicate a meaning related to personality character.	Explains that graphology can be used to see deaf children's expression of thoughts through handwriting.
Q1	To collect data related to my current research, I need some data from you as a graphology analyst. Just for the first question, how can graphology be used as an assessment of the deaf?	On the use of graphology as an assessment for the deaf.
A1	Graphology comes as an alternative to see how a person expresses thoughts and responses through his writing, into certain strokes which in the end the strokes do indicate a meaning related to personality character.	Explains that graphology can be used to see deaf children's expression of thoughts through handwriting.

Table 1 shows that graphology can be used to represent a person's character, behavioral tendencies, and personality based on their handwriting. Writing activities are a form of body reflex related to brain nerves; therefore, they can be used as a measure of the mood and physical, emotional, and mental conditions of the writer (Dwikardana et al., 2019). The corpus calasum nerve is the part of the brain that controls the shape and style of writing (Achsinfina, 2018). Therefore, individuals do not produce the same writing as one another because they do not think about movements when forming letters to be written (Musman, 2019). Based on the results of interviews with the analyst, it is known that

"...graphology presents an alternative to seeing how a person expresses thoughts and responses through his writing, into certain strokes which in the end the strokes do indicate a meaning related to personality character."

This makes analysis of handwriting a projective test (Dwikardana et al. 2019; Marano et al. 2020). Handwriting is considered a projective test because there are interpretive, constructive, and cathartic elements; namely, each stroke produced gives meaning, places recognizable parts, and can project emotional release (Dwikardana et al., 2019). The constructive element in question is also stated in the results of ambiguous stimuli without a formal structure that can represent a wide difference in meaning, such as letter writing patterns, letter formation, and composing words (Dwikardana et al., 2019; Marano et al., 2020). Furthermore, handwriting produces formation while maintaining the form of sentences, filling in spaces, and other punctuation marks and has a creative element in conveying messages for the purpose of writing itself (Dwikardana et al., 2019). It has an accuracy rate of 85–90% (Ludvianto, 2020).

There are various characteristics of writing that are analyzed to represent certain attitudes or actions. In terms of communication ability and social interaction, the characteristics and features of writing are seen based on the level of speed that generally expresses a response to the environment (Musman, 2019). The size of writing illustrates concentration, level of confidence, and openness to others. Furthermore, distance in writing provides information about the author's perspective on social involvement and its relationship with the decision-making process. Furthermore, the distance between words exceeding two to three letters illustrates a person's level of discomfort in interacting (Ludvianto, 2020). The slope of writing and margins represents a person's stability (Musman, 2019).

The handwriting analysis conducted in this study was based on the signs that describe certain traits or indicators in the KAROHS model. This model uses a measurement tool called "Graphologycal Assessment: General Handwriting Analysis (GHA) Form". Each aspect of personality was divided into 3 (three) categories: major traits, intensifying, and reducing traits. These signs were divided into several indicators that represented the aspects under study. The indicators shown are custom results carried out by the concerned analyst.

Major traits are marks that represent key personality indicators. Regarding communication, major traits are determined based on a person's verbal ability. By analyzing the level of speed, flow in writing / serial writing, and open "a" and "o" letters that describe someone talkative. Meanwhile, the major traits of social interaction ability are determined by the need for involvement ability. By analyzing the size in writing, the dominant letter shape is round or flowing, the slope of the writing, and the distance between words and margins that tend to fill in towards the right (Karosh, 2022).

The intensifying traits were positive indicators. Indicators of this sign can add to or support the abilities of the major traits. Several indicators can be used to determine the aspects analyzed. These signs in communication skills are fluidity as an indicator of clarity in expression or adaptiveness when communicating, broadmindedness as an indicator of tolerance for different views and opinions, and frankness open and honest in conveying information. Next, the intensifying sign of social interaction ability is divided into several other indicators, namely, dignity as an indicator of the ability to present oneself in a social environment and loyalty, which is an indicator of loyalty to a person or goal.

The reducing traits represent negative indicators. Its influence can inhibit or reduce the ability of major traits. Regarding communication ability, the indicators are sarcastic, which is an indicator of the potential use of destructive diction in communication; secretiveness, an indicator that indicates covering up the truth or not talking about certain information; reticence, which is the tendency to remain silent or less communicative; and narrow-mindedness, an indicator that indicates an unacceptable attitude towards other points of view. Furthermore, reducing signs in the aspect of social interaction skills, namely aggression as an indicator of seeing the potential to attack or fight back, deceptiveness, which is the tendency to manipulate others, and resentment, is an indicator of seeing concerns about being used by others.
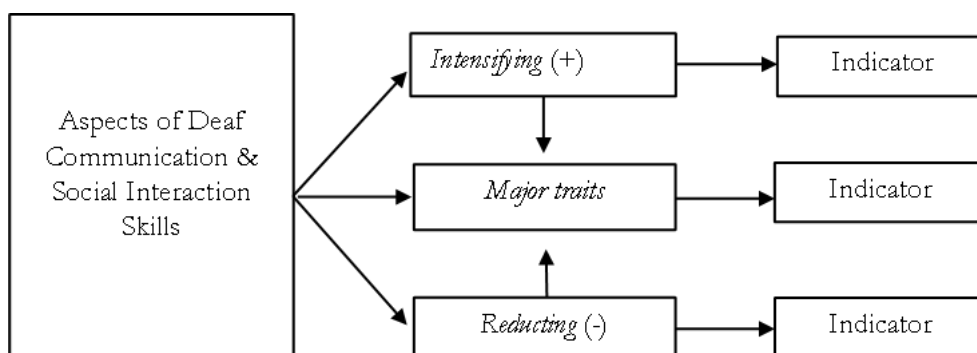
Figure 1. Aspects of deaf communication & social interaction skills in grapology analysis

Figure 1 categorizes the traits that affect the communication and social interaction skills of deaf individuals based on a graphical analysis. These traits were divided into three categories: intensifying traits, which are positive indicators that enhance major traits; major traits, which are the primary characteristics being analyzed; and reducing traits, which are negative indicators that inhibit major traits. Each category includes specific indicators that help to assess and understand the communication and social interaction abilities of deaf individuals.

A total of 140 indicators were measured in a score range with a low score of 0-3, a medium score of 4-6, and a high score of 7-9. The determination of scores on the marks that appear in the analyzed indicators is carried out by two calculation techniques, namely by formula and by note (Mulachela, 2020). If a mark is not found in the writing, the resulting score is 0 (Karosh, 2022).

The scores obtained were then reviewed and described again based on the characteristics of the writing that appeared to represent indicators in the categories of major traits, intensifying traits, and reducing traits. Scores generated from the indicators of intensifying traits had a positive influence on the ability of major traits. Conversely, the higher the score produced for reducing traits, the more it inhibits or reduces the ability of the major traits. However, the intensifying traits mentioned do not always yield positive results.

An explanation for the results of further analysis is as follows.

"...the results of the analysis carried out on aspects of deaf people's communication skills show that there is an urge to tell stories from within, but due to limitations or lack of tendency to socialize, this becomes less prominent and finally has a tendency to want to interact more with people who he thinks have a special frequency or closeness to himself."

The expression then illustrates that there are dynamics in the communication skills and social interactions of deaf people. These personality dynamics are the result of intensifying and reducing traits towards major traits in communication and social interaction skills. Thus, one characteristic that appears in the writing of one of these indicators cannot represent the main abilities of the major traits. Thus, the communication and social interaction skills of deaf people are reflected in the major traits and are clarified based on the indicators of intensifying and reducing traits.

"...the report on the results of the analysis is expected to be more able to recognize what are the strengths and weaknesses and improvise on signs that allow to improve their competence for the better, or perhaps minimize things that are negative and can harm themselves..."

This statement indicates that the results of the analysis can be used in intervention efforts. This can be achieved by involving the deaf person's self-understanding and adjusting the approaches of parents and teachers.

Discussion

4.1 Application of Graphology as an Assessment

Deaf people often experience difficulties in communication, learning, and problems related to each student's personal, familial, and social (Herdiyanti, 2017). In deaf and hard of hearing people, there is a tendency to behave pessimistically, withdraw from the environment, unable to build social relationships, difficulty communicating with the mentor teacher, and vice versa the mentor teacher is difficult to communicate with this type of disability (Hidayat et al., 2022). Barriers to communication often occur, such as difficulty concentrating when communicating in social interactions with their environment (Ainnayyah et al., 2019). Therefore, there are limitations to asking questions to make certain diagnoses for deaf people (Kushalnagar et al., 2019).

Graphology is widely used to describe individuals. These include honesty, emotional stability, attitude, and emotional levels. Furthermore, handwriting can reveal mindset, ego strength, basic motivation or instinctual drive, social relationships, work productivity, and help overcome problems (Achsifinna, 2018). In particular, graphology plays an important role in various aspects of life, such as self-conflict and its relationship with daily behavior of parents or students in the context of education, recognition of a partner's personality, employee selection or team building, detection of several types of disorders and diseases in the medical world, and forensic use in the legal world (Karosh, 2022).

Furthermore, the method of analyzing handwriting can differ according to the model used by the graphologist. Objective measurement tools in the form of rulers and protractors to calculate slope, height and size, regularity, alignment, and continuity are various ways that complement the measurements taken (Marano et al., 2020). Thus, the handwriting analysis carried out is not seen based on subjectivity by examining only writing (Karosh, 2022). Therefore, the results of handwriting analysis can be used as a basis for approaching deaf people.

Research on the famous Indonesian historian Soekarno has been conducted to reveal its psychological and personality aspects. The application of graphology to handwriting provides explanations related to various aspects of personality, including communication skills and social interactions (Fauzi and Yulianti, 2022).

4.2 Reading signs and analyzing indicators in graphology on aspects of communication and social interaction of deaf people

Furthermore, the output of the handwriting analysis conducted on five deaf participants is shown in Tables 2 and 3. Table 2 presents the indicators of communication skills (major traits, intensifying and reducing). Participants' abilities in verbal facilities, fluidity, broadmindedness, frankness, sarcasm, secretiveness, reticence, and narrow-mindedness were measured and compared.

Table 2. Indicators of communication skills (*major traits, intensifying,* and *reducing*)

Partici pants	Major traits	Intensifying (+)				Reducting (-)		
	Verbal Facility	Fluidity	*Broadmin dedness*	Frankness	Sarcastic	*Secretiven ess*	Reticence	*Narrow-mindednes s*
AMS	Low	Low	Medium	Medium	Low	Medium	High	Medium
JM	Low	Low	Medium	Medium	Low	Medium	High	Medium
N	Medium	Low	Low	Medium	Low	Medium	High	High
RCT	Medium	Medium	Low	High	Low	Medium	Medium	High
ST	Medium	Low	Medium	Medium	Low	Medium	Low	Medium

Table 3 illustrates the indicators of social interaction skills (major traits, intensifying and reducing). The participants' abilities in need of involvement, dignity, loyalty, aggressiveness, deceptiveness, and resentment were evaluated.

Table 3. Indicators of social interaction skills (*major traits, intensifying,* and *reducing*)

| Participants | Social Interaction Ability Indicator | | | | | |
| | *Major traits* | *Intensifying (+)* | | *Reducing (-)* | | |
	Need for Involvement	Dignity	Loyalty	Aggressive	Deceptive-ness	Resentment
AMS	Low	High	Medium	Low	Low	Low
JM	Low	High	Medium	Medium	Low	Medium
N	Low	Low	Medium	Medium	Low	Medium
RCT	Low	Medium	Medium	Low	Low	Low
ST	Low	Medium	Medium	Low	Low	Low

Communication skills and social interactions are the aspects reviewed in this study. The signs in the analyzed writing produce meaning in explaining existing indicators. The results indicate that the social interaction of the deaf is not disturbed, and that they are able to communicate verbally. Deaf people show an urge to verbally convey something. However, owing to the limitation or lack of need to socialize, as well as the reducing sign, whose influence reduces the ability of the major traits, the major traits in the ability aspect cannot be done optimally.

Based on the results of the analysis, it is known that verbal facility is a major trait aspect of communication ability towards N, RCT, and ST, showing the results of verbal ability in the medium score range. A medium score indicated that individuals could interact with their verbal abilities. However, other indicators of the intensifying sign scored low and the urge to speak could not be assessed. According to Juherna (2021), this is supported by a lack of listening skills, especially from an early age, which can hinder aspects of language development (Juherna et al., 2021).

Furthermore, regarding the major traits of social interaction, namely the need for involvement, all participants scored low. However, by positively influencing intensifying traits such as dignity and loyalty in the high- and medium-score ranges, deaf people can engage in social involvement. In this case, AMS and JM scored highly on this scale. This illustrates that individuals present themselves to blend in with their social environments. The RST and ST obtained a medium-scale score that illustrated the tendency to engage in social engagement at certain times only, although not always. This tendency becomes a coping strategy or social desire related to the need to show themselves as people who have high resilience and do not complain about their conditions (Grutta et al., 2023). Meanwhile, regarding JM, N scored on a low scale, namely the tendency to behave to limit social relationships supported by indications of concern about being used by others. This can occur because of limited hearing and speaking abilities, such that deaf people are less sensitive to the surrounding environment, are more comfortable in their own world, and do not easily trust outsiders. This tendency is caused by a feeling of alienation, which gives rise to an egocentric attitude and fear of the wider world (Pangestuti, 2021).

For example, the application of graphology to deaf people is seen based on the results of the analysis conducted, and it is known that there are indications of dignity with high and medium scales. Therefore, despite their low interest in social engagement due to their limitations, this does not mean that they want to be seen as weak. This is the same as the results of the graph analysis of the other aspects. For example, when teachers want to teach a subject by touching a deaf person, they are reluctant to learn and withdraw. The results of this graphological analysis can be used as a basis for the fact that the individual has a sufficiently high level of sensitivity so that the approach taken is not recommended to use touch. Thus, deaf people's handwriting can be used as an alternative instrument for conducting assessments. In addition, it can be used as a basis for providing an appropriate approach because it is not based on subjectivity. In addition, the self-development of deaf people's abilities can be reviewed based on the indicators that represent each sign.

4.3 Intervention for deaf people based on the results of graphological analysis
The approach that can be given can be seen and adjusted to the results of the analysis that has been carried out. Thus, the adopted approach was appropriate and in accordance with the characteristics. Thus, efforts can be started by

oneself and people in the surrounding environment, such as parents, teachers, friends, and so on.Teachers and parents can adjust what kind of approach is more appropriate when they want to discuss with a deaf person based on the results of the analysis. Especially can be seen in particular, the main indicators of major traits tend to be improved or optimized again based on the dynamics of the indicators in the intensifying and reducing signs.

Interventions can focus on encouraging storytelling to support deaf people's understanding and reflection. Mentoring activities in the form of social participation in an inclusive setting has shown success in character building (Amka & Mirnawati, 2020). In addition, tourism activities can be carried out with the hope of helping increase the social involvement of deaf people to become familiar with the wider world. This is done to facilitate deaf people in developing socialization and communication skills, as well as to help them realize more effective behavior (Dapa & Mangantes, 2021).

In seeing and determining the needs of deaf people, the school makes observations that take a long time, whereas graphological analysis can be performed in a relatively short time according to the number of students being analyzed. These indicators can explain the main problems or potential that can be addressed in the deaf with a more targeted school environment. Other findings in this study indicate that the professional attendance of special populations, such as deaf people, has not been optimized. This is particularly true in inclusive schools such as schools for people with disabilities.

Conclusion

Graphology works by analyzing the signs that appear and then producing a meaning to explain each indicator. Therefore, the results of the handwriting analysis can be used as an alternative for gathering the characteristics and conditions of deaf people without involving oral communication or a long observation time. In addition to the aspects of communication and social interaction, analysis can be performed on other aspects of personality that are required to optimize self-development. Based on the research that has been conducted, it is found that deaf people's social interaction is basically uninterrupted, and they are able to communicate verbally. Intensifying and reducing signs affect this ability. Thus, handwriting analysis can be used to assess deaf individuals. We hope that the application of graphology can be used as a basis for providing a personal approach for deaf people. Future research is expected to provide a broader discussion on how to provide counseling services and needs in self-development for deaf people based on the results of the handwriting analysis conducted. We hope that these counseling services will be used as part of the planning of guidance and counseling programs in inclusive education.

References

1. Achsifinna. (2018). *Menguak Rahasia Tulisan Tangan*. Pt Niaga Swadaya.
2. Ainnayyah, R., Maulida, R. I., Ningtyas, A. A., & Istiana. (2019). Identifikasi Komunikasi Anak Berkebutuhan Khusus Dalam Interaksi Sosial. *Jurnal Pendidikan Inklus*, *3*(1), 48–52. https://doi.org/10.26740/inklusi.v3n1.p48-52
3. Amka, A., & Mirnawati, M. (2020). Inclusive Practices : Strengthening Character Through Social Participation Of Deaf Students. *Pedagogia:Jurnal Pendidikan*, *9*(2), 243–258. Https://Doi.Org/10.21070/Pedagogia.V9i2.280
4. Anggara, E. B. R., & Wagino. (2018). Penyaluran Tenaga Kerja Anak Tunarungu Pasca Smalb Diajukan Kepada Universitas Negeri Surabaya Untuk Memenuhi Persyaratan Penyelesaian Program Sarjana Pendidikan Luar Biasa Oleh Eka Boma Rezi Anggara Jurusan Pendidikan Luar Biasa. *Jurnal Pendidikan Khusus*, *1*(2), 1–15.
5. Dapa, A. N., & Mangantes, M. L. (2021). *Bimbingan Konseling Anak Berkebutuhan Khusus*. Deepublish.
6. Dwikardana, Sapta, Emmy, & Rosalia. (2019). *Practical Handbook Of Graphologi : Pedoman Praktis Membaca Karakter Melalui Tulisan Tangan*. Kanisius.

7. Fadhilla, M., Saf, M. R. A., & Sahid, D. S. S. (2017). Pengenalan Kepribadian Seseorang Berdasarkan Pola Tulisan Tangan Menggunakan Jaringan Saraf Tiruan. *Jurnal Nasional Teknik Elektro Dan Teknologi Informasi (Jnteti)*, *6*(3), 365–373. Https://Doi.Org/10.22146/Jnteti.V6i3.340

8. Fauzi, W. I., & Yulianti, I. (2022). Jejak-Jejak Psikologis Dalam Tulisan Tangan Bung Karno. *Jurnal Sejarah Citra Lekha, 7*(1), 58–73. https://doi.org/10.14710/jscl.v7i1.36521

9. Grutta, S. La, Piombo, M. A., Spicuzza, V., Riolo, M., Fanara, I., Trombini, E., Andrei, F., & Epifanio, M. S. (2023). The Relationship Between Knowing Sign Language And Quality Of Life Among Italian People Who Are Deaf : A Cross-Sectional Study. *Healthcare*, *11*(1021), 1–11.

10. Hasan, M., Harahap, T. K., Hasibuan, S., Rodliyah, I., Thalhah, S. Z., Rakhman, C. U., Ratnaningsih, P. W., Inanna, Mattunruang, A. A., Herman, Nursaeni, Yusriani, Nahriana, Silalahi, D. E., Hasyim, S. H., Rahmat, A., Ulfah, Y. F., & Arisah, N. (2022). *Metode Penelitian Kualitatif*. Tahta Media Group.

11. Hasri, F., & Permadi, S. R. (2023). Seminar Pendidikan Inklusi : Mengenal Lebih Dekat Anak Berkebutuhan Khusus (Abk) Di Tk & Play Group Naurah Makassar. *Karya: Journal Of Educational Community Service*, *2*(1), 1–8.

12. Herdiyanti, M. (2017). *Pelaksanaan Strategi Layanan Bimbingan Dan Konseling Bagi Siswa Tunarungu Di Sdlb Colomadu*. Universitas Muhammadiyah Surakarta.1-98

13. Hidayat, T., Gutji, N., & Sekonda, F. A. (2022). Upaya Guru Bimbingan Dan Konseling Dalam Menangani Masalah Anak Berkebutuhan Khusus Tunarungu Dan Tunawicara Di Smkn 4 Kota Jambi. *Jurnal Pendidikan Tambusai*, *6*(1), 2517–2521. https://eprints.ums.ac.id/id/eprint/55468

14. Isma, S. T. (2018). Meneliti Bahasa Isyarat Dalam Perspektif Variasi Bahasa. *Kongres Bahasa Indonesia*, *1*(2), 1–14.

15. Jannah, F., & Gumelar, R. G. (2024). Teknik Komunikasi Barista Tunarungu Sunyi Coffee Dengan Konsumen. *Perspektif Komunikasi: Jurnal Ilmu Komunikasi Politik Dan Komunikasi Bisnis*, *8*(1), 57–66.

16. Juherna, E., Putri, A. F., Sugihartini, E., Valentina, F., Mutmainah, L. H., & Ramadhaniati, V. (2021). Meningkatkan Kemampuan Membaca Pemahaman Pada Anak Tunarungu. *Journal Pelita Paud*, *5*(2), 256–261. https://doi.org/10.33222/pelitapaud.v6i2.1598

17. Karosh, E. M. (2022). *Pre-Master Course Of Handwriting Analysis Graphology*. Karohs International School.

18. Kushalnagar, P., Reesman, J., Holcomb, T., & Ryan, C. (2019). Prevalence Of Anxiety Or Depression Diagnosis In Deaf Adults. *Journal Ofdeaf Studies And Deaf Education, 24*(4), 378–385. Https://Doi.Org/10.1093/Deafed/Enz017

19. Lesmana, G. (2021). *Bimbingan Konseling Populasi Khusus*. Prenada Media.

20. Lestari, Y. I., & Laksono, K. (2022). Implementasi Pola Tulisan Tangan Untuk Memahami Karakter Siswa Kelas 1 Sdn Sumberjati 1. *Bapala*, *9*(1), 62–78. https://ejournal.unesa.ac.id/index.php/bapala/article/view/44896

21. Ludvianto, B. (2020). *Analisis Tulisan Tangan: Grapho For Success*. Gramedia Pustaka Utama.

22. Marano, G., Traversi, G., Gaetani, E., Sani, G., & Mazza, S. (2020). Review Article Graphology : An Interface Between Biology , Psychology And Neuroscience. *Psychological Disorders And Research*, *3*(3), 1–13. Https://Doi.Org/10.31487/J.Pdr.2020.03.05

23. Michon, J. H. (1884). Système de graphologie. Ghio. Retrieved from http://books.google.com/books?id=gF0OAAAAYAAJ&oe=UTF-8

24. Muhammad, F. (2022). *Yayasan Lembaga Pendidikan Islam Riau Universitas Islam Riau*. Universitas Islam Riau.

25. Musman, A. (2019). *Buku Ampuh Membaca Karakter Dan Kepribadian Melalui Tulisan Tangan Dan Tanda Tangan*. Psikologi Corner.

26. Nasution, A. F. (2023). *Metode Penelitian Kualitatif*. Cv. Harfa Creative.

27. Nathan, P., Marschark, M., & Spencer, P. E. (2016). *The Oxford Handbook Of Deaf Studies, Language, And Education*. Oxford University Press. Https://Doi.Org/10.1093/Oxfordhb/9780195390032.001.0001

28. Nofiaturrahmah, F. (2018). Problematika Anak Tunarungu Dan Cara Mengatasinya. *Quality*, *6*(1), 1–15. https://doi.org/10.21043/quality.v6i1.5744

29. Pahleviannur, M. R., Grave, A. De, Dani Nur Saputra, S.Pd, M. S. D. M., Sinthania, D., Hafrida, L., Bano, V. O., Susanto, E. E., Mahardhani, A. J., Amruddin, Alam, M. D. S., Lisya, M., & Ahyar, D. B. (2022). *Metodologi Penelitian Kualitatif*. Pradina Pustaka.

30. Pangestuti, D. (2021). Pemberdayaan Penyandang Disabilitas Fisik Melalui Pelatihan Vokasional Pada Program Rehabilitasi Sosial (Studi Kasus Di Balai Besar Rehabilitasi Sosial Penyandang Disabilitas Fisik "Prof. Dr. Soeharso" Surakarta). In *Jurnal Kewidyaiswaraan* (Vol. 6, Issue 1, Pp. 1–10). https://doi.org/10.36709/bening.v2i1.10580

31. Rachman, A., Awaru, A. O. T., & Anrical. (2022). S5-Interaksi Sosial Dan Pola Komunikasi Siswa

Penyandang Tunarungu Di Sekola H Luar Biasa (Slb-B Ypplb Makassar). *Phinisi Integration Review*, *5*(1), 1–14. Http://Ojs.Unm.Ac.Id/Pir

32. Rahayu, D., Nurdin, N., Fauziah, S., & Mansur, M. (2023). Model Komunikasi Guru Dan Tenaga Kependidikan Terhadap Siswa Tunarungu Di Slbn Konda. *Al-Munzir*, *16*(2), 73. Https://Doi.Org/10.31332/Am.V16i2.4359

33. Rustamaji, E. A., & Harsiwi, N. E. (2024). Analisis Pola Komunikasi Pada Anak Berkebutuhan Khusus (Tunarungu) Di Slb Ayodya Tulada. *Sumikolah : Jurnal Ilmu Pendidikan*, *2*(1), 1–8.

34. Safithry, & Aryani, E. (2018). *Asesmen Teknik Tes Dan Non Tes*. IRDH.

35. Siswanto. (2012). *Grapologi*. Libri.

36. Soekanto, S. (2009). *Sosiologi Keluarga*. Rineka Cipta.

37. Soekanto, S. (2018). *Sosiologi Suatu Pengantar Edisi Revisi*. Rajagrafindo Persada.

38. Soewito. (2019). *Ortopedagogik Anak Tunarungu Edisi Revisi*. Depdikbud RI.

39. Sumarto, & Harahap, E. K. (2020). *Komunikasi Bimbingan Dan Konseling*. Buku Literasiologi.

40. Susetyo, B., Homdijah, O. S., & Siswaningsih, W. (2023). *Standarisasi Instrumen Tes Hasil Belajar Ipa Untuk Mengukur Kognitif Siswa Tunarungu*. Uwais Inspirasi Indonesia.

41. Wahyu, N. F. (2023). *Pengasuhan Anak Dengan Disabilitas*. Dinas Perempuan Dan Anak Provinsi Jawa Tengah.

42. Wahyuni, S. E. (2018). *Graphology For Us*. Elex Media Komputindo.

43. Wibowo, M. E. (2018). *Profesi Konseling Abad 21*. Unnes Press.

44. Wibowo, U. D. A. (2022). Pelatihan Grafologi Untuk Guru Bimbingan Dan Konseling Sltp/Slta Muhammadiyah Di Kabupaten Banyumas. *Jurnal Dharma Bhakti Ekuitas*, *7*(1), 57–61. Https://Doi.Org/10.52250/P3m.V7i1.570

45. Wiersma, W., & Jurs, S. G. (2019). *Research Methods In Education: An Introduction*. Pennsylvania State University.

46. Wiryanto. (2014). *Pengantar Ilmu Komunikas*. PT Grasindo.

47. Yudowati, K. A., & Lumajang, B. W. (2021). Pola Komunikasi Guru Agama Islam Dalam Membina Akhlak Anak Disabilitas. *Nusantara: Indonesian Journal Of Islamic Studies*, *1*(1), 129–158 .