The aim of the study was to assess self-reported individual differences in the use of the inner speech of adolescents with Social (Pragmatic) Communication Disorder (SCD) and in particular to answer the questions: Do adolescent with SCD have inner speech and what is the direction of this speech? Is this a monologue and internal dialogue, i.e., do they speak to themselves (internal monologue) or to other people (internal dialogue)?

We tested 22 adolescents with SCD, diagnosed according to the DSM-5 criterion. The average age was 16.48 years, SD = 2.71. The youngest patient was 12 years old and the oldest was 19 years old. The modified version of the Puchalska-Wasyl Scale of Inner Speech was used for the study. The questionnaire was tailored to the capabilities of the persons with SCD and included questions about the occurrence of internal speech and the direction of this speech, that is, internal conversations to yourself (internal monologue) or to other people (internal dialogue). The patients participating in the experiment were informed in detail about the whole procedure and they or their parents, if they were under age, provided written consent for their participation in the experiment (according to the guidelines of the Helsinki Declaration, 2008).

Statistical analysis showed that in adolescents with SCD there is a statistically significant relationship in the frequency of the monologue and internal dialogue. Persons who declared a more frequent occurrence of internal dialogue also declared more frequent occurrences of internal monologue, which means that they had the general ability for inner speech. A comparison of the direction of inner speech, that is the internal monologue and internal dialogue has shown that during inner speech they more often use internal dialogue than internal monologue.

It was found that in adolescents with SCD, inner speech is present, and it manifests itself in the form of an internal monologue and internal dialogue. However, far more often do they use internal dialogue than internal monologue.

Key words: neurodevelopmental disorders, empathy, social functioning, social rules
INTRODUCTION

Asperger’s Disorder is a neurodevelopmental disorder often referred to as a “mild” type of autism – both of these syndromes interpenetrate each other on one continuum. It is also observed that people who had been diagnosed as having autism in childhood, in adulthood manifest the characteristics of Asperger Syndrome (ASD) (Wing, 2005). This disorder was first described by the Vienna psychiatrist Hans Asperger (Attwood, 2000). Its main features are an impairment of social skills, a lack of flexibility in behavior and thinking, and an aversion to changes and specific interests. Patients with this disorder are also characterized by a lack of empathy, poor non-verbal communication, a bizarre way of speaking, clumsiness and a lack of coordination as well as impaired in the processing of sensory stimuli (Wing, 1986).

In the previous edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), the main diagnostic criteria of Asperger’s Disorder included a “qualitative impairment in social interaction and restricted, repetitive and stereotyped patterns of behavior, interests, and activities.” These deficiencies and patterns caused “clinically significant impairment in social, occupational or other important areas of functioning.” (See also: Albano & Silverman 1996). In the new Diagnostic and Statistical Manual of Mental Disorders (DSM-V), the diagnosis of Asperger’s Disorder no longer exists and has been absorbed into the diagnosis of Autism Spectrum Disorder (ASD). There is also a new diagnosis called Social (Pragmatic) Communication Disorder (SCD), which falls under the category of Communication Disorders and may serve as an alternative diagnosis for someone with Asperger’s-like symptoms (See also: Swineford, Thurm, Baird et al. 2014). It is also stressed that symptoms of ASD and SCD may not be recognized until a later age, when a person with these limitations is faced with increased social demands.

Developmental disorders of language and communication to which SCD belongs present considerable diagnostic challenges due to an overlapping of symptomatology and uncertain etiology (Baron-Cohen 2009; Gibson, Adams, Lockton, Grees 2013). However, ASD is the “persistent impairment in reciprocal social communication and social interaction, and restricted, repetitive patterns of behavior, interests or activities.” The symptoms and behaviors must be present from early childhood and negatively impact everyday functioning. According to the American Psychiatric Association, “the symptoms of people with Autistic Spectrum Disorder will fall on a continuum, with some individuals showing mild symptoms and others having much more severe symptoms.” (see also: Baron-Cohen, Bowen, Holt et al. 2015). Accordingly, SCD is “characterized by a primary difficulty with pragmatics, or the social use of language and communication, as manifested by deficits in understanding and following social rules of verbal and non-verbal communication in naturalistic contexts, changing language according to the needs of the listener or situation and following rules for conversations and story-telling.” (see also: Baron-Cohen, Bowen, Holt et al. 2015).
A person diagnosed with SCD has difficulty with “effective communication and social participation, development of social relationships, academic achievement, or occupational performance.” These difficulties cannot be due to low cognitive ability. His/her facial expressions and gestures are as a rule very poor or unnatural, and intonation is flat and inadequate. As a result of the above factors, people with SCD often have difficulties in conducting dialogue. They manifest difficulties in handling conversation because they are not able to see whose turn to speak comes at a given moment. They also quite often interrupt the interlocutor and start talking; not waiting for the other person to stop speaking (Baron-Cohen, Bowen, Holt et al. 2015). The above difficulties are linked to the disorders of central coherence, executive functions and the theory of mind. It impairs their ability to read other people’s states of mind, i.e., the ability to recognize beliefs, intentions of emotions and other people experiences (Gibson, Adams, Lockton, Greer 2013). In consequence persons with SCD are frequently perceived as less intelligent though their level of intelligence may be normal.

Despite the fact that some persons with SCD are able to use the theory of the mind to a certain extent, they function as a „recorder” – they know what has been told to them but they are not able to comprehend the real meaning of these utterances, and what are the emotions, attitudes, and experiences of the said (Jacobsen, 2003). In effect, their empathy is distorted, something that limits their ability to understand the emotions of other people. They also have difficulties in understanding metaphors, allusions and subtexts. In addition they manifest significant difficulties in accepting the perspective of the other person in different contexts and social interactions.

It should be stressed that persons with SCD have a limited ability to understand the information presented in narratives due to the fact that it requires some knowledge resources for understanding the norms of social interactions, stereotypes, event patterns, motives and scripts of action (Kliś, 2004). They also have difficulties in developing coherent narratives which, in consequence, lack coherence, complexity and other basic features of the ordering narrative scheme to organize the events they talk about. At the same time, that are not able to construct self-narratives which severely impair their ability to organize their everyday experiences (Markiewicz 2007). Research shows, however, that some persons with SCD show some narrative abilities that are higher than those of the group. It is, however, possible to develop a narrative competence of these persons with the use of a properly constructed training in constructing and developing narratives (Waligórska, Siedler, Waligórski, 2010).

DEFINITION OF INNER SPEECH AND INTERNAL MONOLOGUE AND DIALOGUE

Clinical observations and scientific research show that our own internal experience is often verbal. It is called inner speech, verbal thinking, hidden self-talk or internal monologue and dialogue. Inner speech can be defined as the
subjective experience of language in the absence of overt and audible articulation (Brocklehurst & Corley 2011). This definition is necessarily simplistic: as the following will demonstrate that experiences of this kind vary widely in their phenomenology, in their addressivity to others, their relation to the self, and their similarity to external speech. Inner speech, on these terms, incorporates itself but does not reduce itself to phenomena such as subvocal rehearsal (the use of phonological codes for the maintenance of information in working memory). The concept is also sometimes used interchangeably with thinking, to the extent that a close focus on the phenomenological, developmental, and cognitive features of inner speech necessitates a certain amount of redefinition of that term. In what follows, we will avoid talking about thinking in favor of mental processes that can be more tightly specified (Alderson-Day, Fernyhough 2015). Dialogue in turn means the exchange of messages by a minimum of two people, its characteristic feature is alternation. The monologue is an uninterrupted utterance of the subject, creating a whole. Similarly, internal dialogue means the exchange of opinions between the two positions of the Self, and the internal monologue – presentation of only one position (Puchalska-Wasyl, 2010).

Plato (undated 1987) wrote a conversation about the human experience. Internal speech plays an important role in the self-regulation of cognition and behavior in both childhood and adults and is important in neurodevelopmental disorders (e.g., SCD, psychiatric disorders) for speech dysfunction associated with atypical language skills or a lack of self-regulation (Fernyhough, 1996, Vygotsky, 1934/1987).

Although internal speech has a visible meaning for human cognition, this topic is given relatively little attention in neuropsychology, partly due to the methodological problems associated with its study. This is because it is difficult to develop research tools to assess this phenomenon. While there exists a range of theoretical perspectives on inner speech (Oppenheim & Dell, 2010), three in particular have proved influential for theorizing about its cognitive functions. One relates to the development of the verbal mediation of cognition and behavior (Vygotsky's Theory 1934/1987; Alderson-Day, Fernyhough 2015), and one – micro-genetic approach – relates to self dialogue, mental state and working memory (Pachalska, MacQueen & Brown).

**VYGOTSKY’S THEORY**

In Vygotsky’s (1934/1987) theory of cognitive development, inner speech is the outcome of a developmental process. Vygotsky assumed that understanding how such a phenomenon emerges over a life span is necessary for a full comprehension of its subjective qualities and functional characteristics. Via a mechanism of internalization, linguistically mediated social exchanges (such as those between a child and a caregiver) are transformed, in Vygotsky’s model, into an internalized “conversation” with the self (Alderson-Day, Fernyhough 2015).
Inner speech in Vygotsky’s opinion is profoundly transformed in the process of internalization, and its development involves processes more complex than the mere attenuation of the behavioral components of speaking. Vygotsky saw support for his theory in the phenomenon now known as private speech (previously egocentric speech), in which children talk to themselves while engaged in a cognitive task. In Vygotsky’s (1934/1987) theory, private speech represents a transitional stage in the process of internalization in which interpersonal dialogues are not yet fully transformed into intrapersonal ones. Vygotsky saw private speech as having a primary role in the self-regulation of cognition and behavior, with the child gradually taking on greater strategic responsibility for activities that previously required the input of an expert other (such as a caregiver) (Alderson-Day, Fernyhough 2015).

Fernyhough & McCarthy-Jones (2013) wrote, that the developmental transition envisaged by Vygotsky [from social to private (egocentric) to inner speech] was proposed to be accompanied by both syntactic and semantic transformations. Internalization involves the abbreviation of the syntax of internalized language, which results in inner speech having a “note-form” quality (in which the “psychological subject” or topic of the utterance is already known to the thinker) compared with external speech. Vygotsky identified three main semantic transformations accompanying internalization: the predominance of sense over meaning (in which personal, private meanings achieve a greater prominence than conventional, public ones); the process of agglutination (the development of hybrid words signifying complex concepts); and the infusion of sense (in which the specific elements of inner language become infused with more semantic associations that are present in their conventional meanings).

Fernyhough (2004) extended Vygotsky’s ideas about inner speech in recent theoretical and empirical research and proposed that inner speech should take two distinct forms: expanded inner speech, in which internal dialogue retains many of the phonological properties and turn-taking qualities of external dialogue, and condensed inner speech, in which the semantic and syntactic transformations that accompany internalization are taken to their conclusion, and inner speech approaches the state of “thinking in pure meanings” described by Vygotsky (1934/1987). In this latter form of inner speech, the phonological qualities of the internalized speech are attenuated and the multiple perspectives that constitute the dialogue are manifested simultaneously. In Fernyhough’s model (2009), the default setting for inner speech is condensed, with the transition to expanded inner speech resulting from stress and cognitive challenge.

Recent empirical research has been largely supportive of Vygotskian claims about the functional significance of private speech, particularly its relations to task difficulty and task performance, and its developmental trajectory (Winsler, Fernyhough, & Montero, 2009; Winsler & Naglieri, 2003).

Vygotsky’s ideas about the role of such mediation in self-regulation have begun to be integrated into modern research into the executive functions, the heterogeneous set of cognitive capacities responsible for the planning, inhibition, and
control of behavior (Cragg & Nation, 2010; Williams, Bowler, & Jarrold, 2012). One implication of Vygotsky’s theory, that inner speech is dialogic in nature, has been proposed to be important in domains such as social understanding (Davis, Meins, & Fernyhough, 2013) and creativity (Fernyhough, 2008, 2009a). Inner speech has also been proposed to have an important role in metacognition, self-awareness, and self-understanding (Morin, 2005).

INNER SPEECH AS A MENTAL STATE

A second important theoretical perspective is based on microgenetic theory. It considers inner speech as a mental state closely connected with the self-system, especially the working self necessary for the development of self identity. The working self uses working memory in the retention of information “online” during a complex task, such as keeping a set of directions in mind while navigating around a new building, rehearsing a shopping list or getting ready for a wedding, which will change the individual’s identity (Pąchalska, MacQueen, Brown 2012). Models of the working self and working memory vary in terms of whether working memory is considered as a single or multi-component process, in its relation to attention, and to the individual differences (Miyake & Shah, 1999). The working self (called also dialogue self) may connect different types of the self, which may connect different types of the self conducting internal dialogues (Brown 1991; Hermans, 2008; Pąchalska, MacQueen & Brown 2012). A person may hold an internal dialogue with various internal images/descriptions of themselves attained in the process of self-evaluation within the ideal self (e.g. optimists/pessimist) or the real self created on the basis of the opinions of others (mostly the significant ones). If they are perceived as a main component of the self we call them internal positions. A person may also conduct an internal dialogue with external positions of the self that are depicted as the mother, the friend or a fictional figure. It should be stressed that the internal monologue may present various images presenting other components of the self, which depends upon the type of drive or desire and the evoked images that were introduced to be a buffer of the working memory itself (see: Fig. 1).

The recursion of perception at the interconnections within the brain (in the working memory) makes it possible for internal dialogue without the necessity to articulate a given piece of information (see Fig. 2.) The perception (P) at Tn is replaced at Tn+1 by another perception (P1), which may resemble or differ from that at Tn. Perceptual stability depends on resemblance; change depends on difference. Within the perception (P2), the mind/brain state at Tn+2 revives Tn+1 almost completely, such that the image of P at Tn+2 is prior to the object (P1), and so on. Over a brief succession of mental states, P, P1 and P2 represent images of past perceptions revived to a decreasing extent in the oncoming present, and graded according to this revival. An eidetic image is a near-complete revival. A memory image is a vague recurrence at some psychic distance from a present object. At Tn+3, the series of images, P, P1 and P2, P3 forms an order antecedent
to the perception (Pn). The perception and memory of serial order depends on the perception developing out of memory. Serial order occurs within the present (Tn perceptions), but depends on succession for the layering of prior experience stored in long-term memory (LTM).

The recursive process of perception enables interactions among various positions of the self that might acquire forms of conflict, negotiations, and agreement. Discrepancies between particular positions of the self occur quite often, and may in fact reflect the healthy functioning of a given individual in his/her striving to self-development.
Since persons with SCD syndrome manifest difficulties in conducting outspo-
kken dialogues it seem possible that they may also have difficulties in holding in-
ternal dialogues. Moreover, it raises the question as to whether they are able to
present only one point of view in their internal monologues or are they able to
adopt various perspectives. Put differently, are they able to adopt different posi-
tions of the self and talk to them or do they prefer to conduct an internal dialogue
or monologue? Beside, do they direct their internal utterances both to their in-
ternal self and the external one? The present study aimed to find an answer to
these questions.

MATERIAL AND METHODS

Material

We tested 22 adolescents with SCD aged 12 to 19. The average age was
16.48 years, SD = 2.71. The patients participating in the experiment were informed
in detail about the whole procedures and they, or their parents if they were under
age, provided written consent for their participation in the experiment (according
to the guidelines of the Helsinki Declaration, 2008).

Methods

The modified Scale for the Evaluation of Inner Speech elaborated by Puchal-
ska-Wasyl (2006) was administered to assess the frequency in the occurrence
of an internal monologue and dialogue. The survey was modified to meet the
limited possibilities of abstract thinking and attention abilities of persons with
SCD. Therefore, the instructions were made short and concrete. The Likertscale
employing such terms as “rarely – several times a day – often – almost always”
were used to denote the frequency in the occurrence of an internal monologue
or dialogue. This modification made the survey understandable for adolescents
with SCD and enabled an obtainment of rich and idiomorphically detailed infor-
mation (see also: Alderson-Day & Fernyhough, 2014).

The evaluation of inner speech – i.e., monologue and dialogue – the abstract
terms of describing one’s own states was replaced by a description of a given
situation to make them easier to understand by SCD adolescents. For example
the term “I – optimist” was replaced by “When I talk to myself that everything will
be O.K.”.

Procedure

Before starting the experiment the participants were given special training
aimed at explaining the difference between an internal dialogue and monologue.
The training took the form of a group discussion, which was directed at explaining
the above difference in order to make sure the participants really understood it.
Definitions of both an internal monologue and dialogue as well as concrete state-
ments exemplifying inner speech were discussed. Next the participants were
presented with the characteristics and possibility and of conducting internal monologues and dialogues. While answering the survey the participants could ask questions if they found some items too difficult and some of them did so.

The statistical significance of differences in the frequency of occurrence of internal monologue and dialogue as well as in reference to the internal and external positions of the self in the examined adolescents was measured with a SPSS program. A factor of age is not presented in the data description since it proved to be insignificant.

**RESULTS**

**Dialogue vs. monologue**

Statistical analyses of declarative frequency of dialogue and monologues in the examined adolescents with SCD (Fig. 3) proved to be statistically insignificant ($t_{(22)} = -0.31 ; p>0.05$). Yet, the correlation between the occurrence of the internal monologue and dialogues proved to be significant. ($r_{(21)} = 0.851 ; p<0.001$). This means that those who report a more frequent use of the internal monologue also declare a more frequent use of internal dialogue, which reflects a general tendency to use inner speech.

The analyzes also took into account the dialogue (self with the imagined self) and the monologue (speaking to oneself in the first person) in relation to the internal position of the Self. And in this case, the subjects more often used the internal form of monologue ($t_{(22)} = 2.21 ; p<0.05$) (Fig. 4).

![Fig. 3. Correlation between the occurrence of internal monologue and dialogue](image.png)
DISCUSSION

The findings of the present study showed that individuals with SCD use inner speech, which confirms the observations of other authors (Williams, Happé, Jarrold 2008). They also argue that the use of the inner speech by individuals with SCD is to some extent the same as individuals without SCD of a comparable mental age. In addition, the study revealed the occurrence of individual differences in the frequency of the internal monologue and dialogue across the examined group. These differences are linked to a general tendency to use inner speech. Individuals who often use internal monologue dialogue display also a strong tendency to hold internal dialogue. It should be noted that some participants reported a constant use of the internal monologue and dialogue, while others stated that they do not experience such types of inner speech. This was not connected with the age of participants, but may be linked to the level of cognitive functions, which, however, indicates a need for further studies.

The administration of survey has some serious limitations since the gathered data is based upon participant reports. Moreover, it included elements of self-description that may be difficult to do for adolescents with SCD. They exhibited difficulties in stating if they are conducting an internal monologue or dialogue, and how often it takes place. Despite a preparatory training they often asked the examiner to help them in answering those items of the survey. It seems that it would be better to give the participants a longer more structured training, and to change the form of the survey into a registration of the occurrence of an internal monologue or dialogue.
It might be of interest to note that the participants reported more frequently the conducting of second-person self-talk in contexts requiring self-regulation (see also: Zell et al., 2012), and that they tended to refer to themselves in the second-person more often than in the first-person (Gammage et al., 2001). Dolcos and Albarracin (2014) suggest that this has an effect on their experimental demonstration of the success of this strategy. Second-person self-talk has been shown to lead to more positive (i.e. challenging as opposed to threatening) appraisals of upcoming events (see also: Kross et al., 2014). As a rule the participants selected positions linked to the critical self and pessimistic self in the internal dialogue directed towards them. That is the positions reflecting negative emotions. The internal dialogue is activated mostly in situations that evoke emotions or when we try to rationalize certain events, e.g., when we are faced with moral dilemmas or when we are making important decisions (Oleś, 2011). Persons with SCD encounter many difficulties in all spheres of their everyday life. This allows for the conclusion that the reason they hold internal dialogues are with the negative aspects of their personality and identity.

Difficulties in social interrelations, limited contacts with their peers and other negative experiences may lead to different communication strategies. In consequence, persons with SCD may hold internal monologue since they feel a need to articulate their opinion but have no chance to say it aloud. Such utterances are not linked to any position of the self, which indicates that persons with SCD may develop an internal narration that is concerned with their current affairs.

**Inner speech in relation to the self-system**

Pąchalska, Kaczmarek i Kropotov (2019) presented a microgenetic model of inner speech (see Fig. 5), in which the inner speech is closely linked to the Self. Such speech appears in relations to the actual type of drive or desire. The formulated text of the inner speech comes out of the working memory buffer only after the drives and desires empowered by emotions are transformed into logically and spatially comprehensive linguistic and nonlinguistic images. That text may be kept in the buffer of the working memory for some time\(^1\), forming the working self and then moved to the long term memory storage. Most of the time it may be only the inner speech taking a form of the internal monologue (talking to the imaginary representation of oneself or the internal dialogue when an individual talks to the imaginary other person (this may have a relatively abstract nature). It needs to be stressed that the form of internal dialogue may differ from the utterance used in a communication act. The internal text may be preserved for significant cognitive, emotional or axiotic reasons in the long term memory and starts to be one of the components of the longitudinal (autobiographic) self.

It is worthy pointing out that inner speech enables the planning of action (Miyake, Emerson, Padilla and Ahn, 2004), and precedes making decisions (acts

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\(^1\) The buffer of working memory keeps the text for about 30 seconds, and even longer off line. It is a so called absolute now (Brown 2015).
of will) both trivial and important matters. A process of passing from a given drive to recording the text in the working memory takes little time due to the effective executive functions and is as a rule finished with outer speech. It usually ends one of many acts of inner speech. However, in the case of really significant matters, or while making important and/or difficult choices between goals that are contradictory, the internal monologue may take a stormy form, full of contradictions, recurrences, and hesitations. It need not end with text creation that can be passed to the working memory or to the long term memory to become a component of the longitudinal self. It results in putting off decisions, difficulties in making a shift of action, deferring etc.

An individual with a healty brain (without cognitive disorders – including speech – and without emotional impairments), and with efficient articulatory apparatus
is able to communicate, i.e., externalize his/her inner speech in two ways: (1) talking to oneself (self instructions, reprimands or praises) or (2) talking to others. But in brain damaged persons with disorders to cognitive processes, including communication, and emotional disorders:

- Inner speech is absolutely absent;
- Inner speech does not control behavior;
- Inner dialogue is much more frequent than inner monologue or vice versa;
- Inner speech will not exteriorize as a self-talk, talking to others or will take a noncommunicative form (with language errors).

Though we have no immediate access to inner speech we may obtain some knowledge (information) about it thanks to nonverbal forms and means of communications such as pictures, photos, pieces of music, pantomime etc.

New brain imaging technologies make possible the recording of occurrences of inner speech. Experiments are usually conducted on healthy fully conscious people but there are also studies that reveal an occurrence of inner speech in patients with minimal consciousness who were awoken from a posttraumatic coma as well as in autistic children. Those studies show that the most active are in these cases the insula and Broca’s area (Alderson-Day & Fernyhough 2015), which are also activated in the cases of outer speech2.

Differences in the tasks used to evoke inner speech may lead to its various forms. Some may provoke an expanded form of inner speech (both internal monologue and dialogue), others may induce only inner monologue, while the more explorative, which stimulate verbal thinking may not induce inner speech.

Since self-talk is a pulsing phenomenon, and can range from positive evaluations of the self in the form of self-encouragement, self-compassion, and self-affirmation to negative evaluations in the form of self-criticism, rumination on negative self-aspects, and expressions of inadequacy or worry (Dolcos and Albarracin 2014), further research should explore this aspect in subsequent studies, combining it with narrative competence. It might be also worthwhile studying whether the positive effects of second-person self-talk might generalize to samples that have more negative chronic self-views (e.g., depressive attribution style or low self-esteem) (see also Libby, Valenti, Pfent, & Eibach, 2011; Wakslak, Nussbaum, Liberman, & Trope, 2008).

**Study limitations**

We are aware of the potential limitations of this study. The most important fact is that our study sample was relatively small and limited to boys only. We have also not introduced a control group due to the exploratory nature of the study. We are planning to extend our research on this subject in the future.

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2 Appearance of phonological associations in memory may cause internal auditory experiences or inner speech, which is linked to experiencing the voices of others.
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