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Rethinking Autism, Theism, and Atheism

Bodiless Agents and Imaginary Realities

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Summary

This anthropologically informed study explores descriptions of communication with invisible, superhuman agents in high functioning young adults on the autism spectrum. Based on material from interviews, two hypotheses are formulated. First, autistic individuals may experience communication with bodiless agents (e.g., gods, angels, and spirits) as less complex than interaction with peers, since it is unrestricted by multisensory input, such as body language, facial expressions, and intonation. Second, descriptions of how participants absorb into “imaginary realities” suggest that such mental states are desirable due to qualities that facilitate social cognition: While the empirical world comes through as fragmented and incoherent, imaginary worlds offer predictability, emotional coherence, and benevolent minds. These results do not conform to popular expectations that autistic minds are less adapted to experience supernatural agents, and it is instead argued that imaginative, autistic individuals may embrace religious and fictive agents in search for socially and emotionally comprehensible interaction.

Keywords

autism – religion – superhuman agents – mentalizing abilities – imagination – fantasy
proneness – emotional coherence – multisensory binding

Introduction

The young adults described in this study differ in many ways, but have two things in common: They are all diagnosed on the high functioning end of the autism spectrum (HFA), and as we shall see, they all experience interaction

with invisible agents. Simon talks to God every day, David fell in love with a Greek goddess, Anastazia plays tricks on spirits in her house, John describes how angels saved him, Boyan prays to Allāh for help in school, and Gustav turns to the Buddha for strength. How can we understand the fact that these autistic individuals, who all struggle to grasp social interaction that takes place face-to-face, still choose to engage in communication with agents that neither have voices nor bodies?

This question became the starting point for the study presented here. Since belief in superhuman agents is expected to rely on mentalizing abilities, and autism offers a case of mentalizing *difficulties*, scholars within the cognitive science of religion (CSR) have doubted whether individuals on the autism spectrum are able to host personal god concepts (Barrett, 2012; Bering, 2002; Boyd, 2008; McCauley, 2011; Tremblin, 2006). There are thus few—if any—previous studies on the cognitive mechanisms involved in autistic individuals who actually experience that there are gods, angels, spirits, or ghosts.

Several empirical CSR-studies however focus on the relation between autism and atheism (e.g., Banerjee & Bloom, 2014; Coleman, 2016; Gervais, 2013; Lindeman & Lipsanen, 2016; Majj et al., 2017; Norenzayan, Gervais, & Trzesniewski, 2012; Reddish, Tok, & Kundt, 2016). Some of these studies show weak and indecisive results, while others show no relation between mentalizing and professed belief (for a detailed discussion, see Coleman, 2016; Lindeman & Lipsanen, 2016; Reddish et al., 2016). Reddish and colleagues (2016) therefore conclude that “further research comparing HFAs relationships with humans and gods may shed further light on the underlying cognition behind their social deficits” (p. 109).

This qualitative and anthropologically informed case study heeds to this call and seeks to complement previous quantitative generalisations through first-person perspectives. Interviews with 17 participants who describe themselves as religious or spiritual were analysed in order to investigate what invisible agents they perceive as significant, how they recognize the mental states of these agents, and how interaction is described in comparison to human relations. Experiential, emotional, and embodied perspectives—that have previously been overlooked—are central in this study.

This article is also a contribution to theoretical discussions within CSR and autism research, and thus begins with a brief introduction to the naturalness of religion, mentalizing in autism, and imagination in autism and religion. After the research design has been described, the results are presented in three sections that attend to: 1) the significance of imbalance between cognitive and affective empathy, 2) the perception of disembodied communication, and 3) the implications of fantasy proneness and absorption into imaginary

realities. Fictional characters from books, movies, and computer games are included in the analysis, and it is argued that from a cognitive perspective, these are equally relevant as traditional “religious” agents. In the subsequent discussion, two novel hypotheses are presented: First, it is suggested that the integration of multisensory and emotional input is central for understanding the difference between embodied and “bodiless” communication, and second, the experience of invisible agents in imaginary realities comes through as attractive because these are socially coherent and predictable for the participants.

The Naturalness of Religion Hypothesis

The *naturalness of religion hypothesis* (e.g., Barrett, 2000; Bering, 2010; Boyer, 1994; Kelemen & Rosset, 2009; McCauley, 2011) is key to understanding why scholars have expected that autistic minds are less adapted to perceive interaction with invisible agents. A central endeavour within the CSR is to explain why similar religious phenomena are found in diverse cultures, and why these seem to persist over time (Barrett, 2004). The notion of superhuman agency is for instance found in various parts of the world, where various invisible beings (e.g., djinn, ghosts, gods, and ancestors) are described as having independent minds and intentions.

To explain this particular religious phenomenon, CSR scholars use a dual process model that distinguishes between intuitive and reflective beliefs (Sperber, 1997). Whereas the intuitive process is fast and often inaccessible on a conscious level (people are for instance generally unaware of gaining information from subtle facial expressions), the reflective process is in turn slow and conscious (such as contemplating if a person is reliable or not). Both these modes have supported group living, survival, and reproduction throughout human evolution (Boyer, 1994).

The intuitive process has been described as composed by several steps. Barrett (2004) refers to these as a battery of “cognitive tools” that he labels *the hypersensitive agency detection device* (HADD). A central HADD mechanism is mentalization, or *theory of mind* (ToM), which is the ability to attribute mental states such as beliefs, intentions, and knowledge to others (Baron-Cohen, 1985); also referred to as *mindreading* (Frith & Frith, 2003). This ability is suggested to underpin detection of superhuman intentionality (Barrett, 2004), teleological attribution of meaning to events (Heywood & Bering, 2014; Kelemen & Rosset, 2009), and beliefs that people have mental states in afterlife (Bering, 2006). Geertz and Markússon (2010) however argue that the naturalness hypothesis is probabilistic, rather than deterministic: Religiosity (i.e., theism) is likely

but not necessary, while atheism is less likely but possible. In other words, we might discard instant intuitions (“the noise is caused by a ghost”), and opt for a natural cause (“the noise is caused by a natural object”) through the slower, reflective process.

Now, while intuitive mentalizing abilities have been understood as central for forming notions about superhuman agency, such abilities are expected to be constrained in individuals with autism. It has therefore been suggested that “poor mentalizing skills would be expected to render religious belief less intuitive, leading to lower levels of belief” (Willard & Norenzayan, 2013, p. 381), and some scholars hold that “individuals with HFA have a higher rate than neurotypicals of endorsing atheism and agnosticism” (Caldwell-Harris, Murphy, Velazquez, & McNamara, 2012, p. 3362; cf. Norenzayan et al., 2012). Results from empirical studies are however ambiguous, and replications have failed (e.g., Jack, Friedman, Boyatzis, & Taylor, 2016; Maij et al., 2017).

Importantly, the studies referenced above do include a number of self-reported autistic *theists*, which leads to the core question in this article: If we accept the premise that mentalizing abilities are central for theism, how come some autistic individuals who struggle with social interaction still engage in relationships with invisible agents?

Cognitive Abilities and Difficulties in Autism

Turning to autism studies, we find that there are important nuances that need to be considered. To begin with, the autistic population consists of a whole spectrum of individuals with great cognitive variety: “Today, autism is clearly understood to be a complex and heterogeneous set of related developmental disorders in which no single cognitive mechanism or cause can account for the variety of symptoms and range in their expression” (Tager-Flusberg 2007, p. 311). Therefore, plural terms such as “autisms” (Boucher, 2011) and “autism spectrum conditions” (Baron-Cohen, Golan, & Ashwin, 2009; Wallace, 2012) have been used to denote that there likely are different subtypes, with a similar display of symptoms. Since there is yet no generic typology, the term “autism spectrum” will be used here, and the discussion focuses on high functioning individuals, who share difficulties in social communication, as well as a general intelligence and verbal ability that is average or above.¹

1 In the previous diagnostic manual (DSM IV) the term *Asperger's syndrome* was used to denote high functioning individuals with normal to high IQ and typically developed verbal ability. Since most of the young adults in the study were diagnosed according to this older

Mentalizing in Autism

Individuals on the autism spectrum are, to varying extent, challenged by social interaction. While most non-autistic individuals intuitively understand subtle body language and irony, the autistic person must make an effort to understand what is communicated. The diagnostic manual DSM 5 describes persistent “difficulties in social communication and social interaction across multiple contexts”, and symptoms must cause “clinically significant impairment in social, occupational, or other important areas of current functioning” (APA, 2013, criterion A and C).

Despite the fact that it is the intuitive process that is affected in autism (Frith & Frith, 2003), the divergence between fast/intuitive and slow/reflective processing is rarely discussed in CSR-studies. Only Reddish and colleagues (2016) note that explicit learning may be used as compensation when intuitive ToM-capacities fail. Use of cognitive terminology is also rather eclectic in the field; mentalizing and ToM have for instance been used interchangeably to denote the “representation of other minds” (Gervais, 2013, p. 381), while “empathising” has been used both to represent “the capacity to understand other people’s thoughts and emotions” (Lindeman & Lipsanen, 2016, p. 1) as well as emotional processes separated from ToM (Vonk & Pitzen, 2017). In this article, the term *mentalizing* will serve as an umbrella term for both fast/intuitive and slow/reflective mindreading competencies, to highlight the fact that both modes can result in interpretations of minds. Cognitive mindreading is also separated analytically from emotional processing.

It is established that individuals on the autism spectrum have difficulties in understanding mental states, but in an evaluation of the ToM hypothesis, Tager-Flusberg (2007) raises questions regarding cognitive processes involved: “They tend not to use the same neurocognitive systems as do non-autistic people; ... performance on theory-of-mind tasks can account for some, though not all, of the severity of the social and communication symptoms that define this disorder” (p. 312). It is consequently argued that difficulties relate to social-perceptual capacities, such as the ability for joint attention, interpretation of facial expressions, and understanding of verbal intonation, which may also explain why older individuals who are able to solve both first-order and second-order ToM tasks still describe real-life social interaction as challenging (cf. Peterson, Garnett, Kelly, & Attwood, 2009). Dewrang (2011) similarly holds that autistic individuals prefer structured situations where things occur one

manual, this is the diagnosis they have. The term *high functioning autism spectrum disorder* (HFA) will however be used to describe all the participants in the study.

at a time to those that are spontaneous and require fast responses. This socio-perceptual perspective is adopted as central in this article. Also IQ (Crane, Goddard, & Pring, 2009) and linguistic abilities (Happé, 1995; Tager-Flusberg & Joseph, 2005) are expected to correlate with cognitive abilities; mentalizing tasks may consequently be solved through logical-reasoning and linguistic processes (Tager-Flusberg, 2007, p. 312), while mindreading may be performed reflectively when intuitive competencies fail.

Autism researchers moreover distinguish between *emotional empathy* (EE) and *cognitive empathy* (CE, i.e., ToM; see Markram, Rinaldi, & Markram, 2007; Rogers, Dziobek, Hassenstab, Wolf, & Convit, 2007; Smith, 2009). Unless the autistic individual suffers from a separate diagnosis of alexithymia, which results in impaired emotion recognition (Bird & Cook, 2013), emotional empathy is expected to be fully functional. Smith (2009) argues that such empathic imbalance confuses the autistic person who may feel that something is wrong but cannot understand why—such as when someone is annoyed but tries to conceal it—who may consequently withdraw from social relations, despite longing for friendship. It has also been suggested that motivation to understand communication may be more essential than actual mindreading abilities, and Vonk and Pitzen (2017, p. 71) argue that emotional empathy is an important representative of such motivation. In other words, the intricacy of cognitive processes involved in mindreading complicates generalizations, and when discussing mentalizing difficulties in autism, we need to specify precisely what it is we have in view.

The Role of Imagination in Autism and Religion

This study also seeks to contribute to the theoretical field concerning imagination in autism. This topic is, to the best of my knowledge, unexplored in relation to autism and religion. There are generally few studies on imagination in autism, which may be due to a misconception of Wing and Gould's (1979) *triad of impairments*, which summarizes the core symptoms of autism as: 1) difficulties in social interaction, 2) social communication, and 3) social imagination. Gould (2016) however emphasizes that the social aspect must be differentiated from imagination per se:

The third area, which people have neglected in thinking about autism, is imagination. And what I mean by imagination, social imagination, is a bit different from imagination stand-alone. Because in the past it was

assumed that people on the autism spectrum had little if any imagination, well of course we know with everything in autism you start off with a premise and over time it changes. And so now we recognize that of course there are lots of individuals with autism who have a rich imaginative world, a creative world. We know of many people within both art and drama who really are exceptional in terms of imagination.

Social imagination is thus related to mentalizing skills and the ability to connect things in the past to present and future social events, but as we will see, several scholars and clinicians seem to confound this with the general ability to create or imagine new things and ideas, here referred to as imagination *per se*. A brief analysis of on-going discussions also reveals a striking discrepancy between emic (insider) and etic (outsider) perspectives.

To begin with, scholars have suggested that autism is inversely related to imagination. In a review by Crespi, Leach, Dinsdale, Mokkonen, and Hurd (2016), imagination is defined as “the faculty or action of forming new ideas, or images or concepts of external objects not present to the senses, typically derived from creative integration of past experiences, learning, or other information” (Jewell & Abate, 2001, p. 848). The authors describe how cognitive areas related to pretend play, creativity, narrative formation, mentalizing, mental imagery, and sensory systems in autism appear to deviate from typical patterns (pp. 183-190), and conclude that these traits contribute to deficits in imagination. Importantly, Crespi et al. (2016) include social imagination in the analysis, although their definition of imagination is non-social.

On the other hand, autistic individuals and their relatives in non-academic fora tell a different story. In a typical conversation at the autistic online forum Wrong Planet, a man with autism describes that he has had vivid imagination and a strong fantasy life throughout his life, sometimes switching between three to four different fantasies. Like Gould, he argues that possible difficulties in autistic imagination are related to social predictions, rather than the ability to fantasize and create new ideas: “When diagnostic descriptions of us say something like ‘poor imagination’ I think they mean that we struggle to predict what people will do next, probably because we don’t guess what they’re thinking like NT’s [neurotypicals] can” (Looking, 2016).

Similarly, parents online debate the fact that their autistic kids play imaginatively at home, despite popular notions that they should be unable to do so. Under the headline “Autism and imagination??” (sic.), it is described how autistic children make up stories, pretend that coat hangers are aeroplanes, rebuild cardboard boxes into boats, and role play that toys are pupils in a

classroom. “Lorraine” for instance explains that her son “has a very vivid imagination when it comes to making up stories, but he has actually told me himself, that when it comes to toys, like a ship and pirates, he just doesn’t know what to do with them” (Lorraine, 2016). Notably, it is stated in the screening instructions of the DSM 5 that neither solitary imaginative play, nor difficulties distinguishing fantasy from reality, is captured through typical screening (criterion A3). This formulation suggests that the features described by these parents are commonly found in autism.

So why do empirical research results indicate that autistic individuals cannot be creative and imagine things that are not literal, while first-hand accounts suggest differently? Confusions may be derived from methods used for measuring imagination. Let us look at a typical case: the often-used Torrance test (Torrance, 1974) was utilized in a study on imagination in autism to measure “creativity [which] involves the generation, manipulation, and transformation of images to generate novel representations” (Craig & Baron-Cohen, 1999, p. 319). In the test, children with HFA were asked to complete pictures with parallel lines and incomplete figures, and were also instructed to improve a toy and suggest what 3D foam shapes look like. The authors conclude that the “results point to ... the role of imagination deficits in the impoverished creativity seen in autism and AS” (p. 325).

Comparing emic narratives with research results, it however seems likely that it is social imagination and the ability to adapt to the tasks given that has been measured in research, rather than the capacity for imagination and creativity per se. A typically developed child may intuitively predict what is expected in a task, while an autistic child or teenager struggles to adapt to assignments prepared by others. The authors do connect their findings to ToM abilities, but overlook the discussion of creative abilities outside such social contexts (Craig & Baron-Cohen, 1999, p. 325). In a review (including the study above), Scott (2013) similarly argues that studies on “spontaneous” production of drawings or creation of patterns confirm that autistic individuals demonstrate lack of “flexibility and lack of conformity that can be inherent to the definition of creativity” (p. 507). There are however no spontaneous elements in these studies, but they measure results on arranged tasks based on social expectations. Social and imaginative competencies thus need to be separated analytically, and comparisons between arranged and spontaneous play in the preferred environment of the child might shed light upon such differences. Gould (2016) emphasizes the necessity for autism researchers to formulate a wide variety of questions and continue probing for new aspects to grasp the full picture.

The formation of new ideas, images and concepts that are not present to the senses is also a central aspect of religious cognition. The power to redescribe reality is for instance held central in Ricœur's (1995) theory of fiction (p. 144), in which Ricœur illustrates how the reader recontextualizes biblical narratives to relate to present situations. Seligman, Weller, Puett, and Bennett (2008) similarly argue that religious rituals build on the ability to experience things "as if" they were real, such as the Eucharist wafer and wine are imagined to transform into flesh and blood in Catholic and Orthodox traditions (p. 24; cf. Taves, 2013, p. 156).

It is argued here that autistic individuals who are able to envision things that are not present (e.g., imagining that a cardboard box is an aeroplane) also should be able to enter into such subjunctive, non-literal modes. Moreover, imagination is a component in notions about non-observable, superhuman agents, and Gould (2016) notes that imaginative, autistic individuals often have imaginary friends. From a cognitive point of view, there is little reason to expect that the experience of invisible friendships is much different from the experience of invisible agents in religious traditions. There are thus overlapping—and yet unexplored—areas where religiosity and imagination connect with autism.

The Present Study

Moving on from theoretical discussions, we now turn to the present study. It is guided by an anthropologically informed approach to autism, in which the researcher studies a group that s/he is not part of and aims to stay unprejudiced and capture subjective perspectives; "thus, it follows people into the scenes of their stories and into the midst of their experiences" (Solomon, 2010, p. 245). Qualitative studies allow for thick and rich descriptions of complex phenomena, and are useful for extrapolating hypotheses that may be used for future testing and generalization to larger populations (Bölte, 2014; Merriam, 2009).

Aim and Research Questions

The general aim of this explorative case study is to formulate hypotheses that are based on first person perspectives on autism, religion, and cognition. In other words, there are no preconceived hypotheses as in quantitative research,

but the study is nonetheless driven by research questions. Special attention has been paid to the role of mentalizing and imagination in autistic individuals' reasoning on invisible agents, and the following research questions have guided the analysis:

- What invisible agents come through as significant for the participants?
- How are the mental states of these invisible agents interpreted and described?
- How is social interaction with invisible agents described in comparison to human relations?

Method

Participants

Seventeen participants (12 males and 5 females), 16-21 years old and diagnosed on the autism spectrum, were recruited through posters and classroom presentations in three Swedish upper secondary schools that require that pupils have a formal autism diagnosis. Education in these schools attends to the special needs of autistic pupils, but follows the ordinary curriculum. It is confirmed through testing of verbal and fluid intelligence that the recruited participants are on the high functioning end of the autism spectrum. The participants have also filled out the Interpersonal Reactivity Index (IRI; Davis, 1980) on emotional and cognitive empathy, and there are no signs of alexithymia or problems with emotional processing in the data. The study was approved by the Swedish Ethical Review Board and follows central guidelines for good research practice (Swedish Research Council, 2011). Anonymity was for instance preserved by designated code names, and details that could lead to identification were removed.

Procedure

In the initial phase, participants met with the researcher three times to fill out self-report surveys and psychometric tests. Those who clearly affirmed an active element related to religion (including the emic term 'spirituality') in a questionnaire on religious affiliation, belief, practice and experiences (Thurfjell, 2015; Burén, 2015) were included as participants for the study. Also Annie and Leonardo, whose religious engagement was in the past, but who had elements of intense imagination in the present, were included in this group. A comparison group, carefully matched according to age, gender and religious

orientation,² was also put together for the quantitative measures (thus not including the interviews described below).

In the second phase, qualitative in-depth interviews were conducted. A photographic life-story interview was designed for the study, to a) include aspects of religion that the participants consider relevant, b) make the interview situation more predictable and comfortable, c) aid visual thinkers through the use of imagery, and d) allow for the interviewee to take the role of an expert, and thus overturn traditional power relations. The participants thus prepared their own interviews by capturing whatever they would relate to religion and/or spirituality in their lives (e.g., objects, places, persons, gatherings, holidays, experiences, sensations, ethics, ideas),³ using disposable or digital cameras and taking notes. When finished, the photos were developed in a lab and brought to the interview occasion by the researcher.

During this final meeting, the participant was instructed either to arrange the photos on a table or present the digital pictures on the mobile phones or laptops. While being guided through the photos, the researcher inserted questions according to a semi-structured interview model, to probe for reasoning related to the overall research project (for instance exploring the relevance of prayers, rituals, relations, and objects), and to check that reports were correctly understood. This approach engaged the participants and elicited several unforeseen narratives. Since the photos were a means to access narratives and not a measure per se, participants kept the pictures, while the researcher kept the contact sheets with miniature copies for mnemonic support.

Interview Coding

The recorded interviews were transcribed verbatim, and punctuation (full stops, commas, and ellipses) was inserted to indicate pace of speech. The transcriptions were coded according to the guidelines for *interpretational phenomenological analysis* (IPA): an idiographic, qualitative method used within cognitive psychology to enable in-depth exploration of subjective thoughts, beliefs, and perceptions (Smith, Jarman, & Osborn, 1999, p. 219).

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- 2 Per is for instance included to match Leonardo since he similarly has agnostic tendencies but also an interest in Buddhism, existential questions, science, and is fantasy prone. There is also an individual in each group who has an insecure gender identity, but who is categorized legally as male.
 - 3 A few participants chose not to use cameras at all, since they could not figure out how to illustrate abstract ideas. Instead, they took notes and/or brought laptops to show their personal photographs and pictures from the Internet.

As conventional when using IPA-coding, the process involved several steps. Initial notes were made in a table with emerging themes during the transcription of interviews. Next, a detailed analysis and thematization was made through a close reading of the transcripts, during which the researcher formulated new themes, picked up previously overlooked details, and merged themes that initially appeared to be separate. A table with main themes and subthemes was gradually completed. In the presentation of illustrative quotes below, translations to English were made by the researcher, and humming and stuttering were removed to facilitate reading. Else quotations were kept as literal as possible.

Results

The results in this article are based on three main themes⁴ that were extracted from the interviews, as illustrated in Figure 1. These connect to the ability of forming mental representations of imaginary and invisible agents. The process of defining themes was abductive, involving both a top-down search for mentalizing and communication with invisible agents, and bottom-up attention to unexpected topics emerging from the material.

The impact of empathy imbalance is introduced in the first section, and results from the interviews are triangulated against results from the IRI-scale. The second section on bodiless communication with invisible agents is derived from the deductive search for reasoning related to mentalization (theme 1). The third and final section on imagination and superhuman agents from popular culture originates from inductive attention to the material (themes 2 and 3).

The term *bodiless* denotes perception of agents that are free from multi-sensory, bodily input. This term is in turn based on the concept of *invisible agents*, stipulated as non-empirical characters that are perceived as having a mind of their own, and intentions upon which they act (Barrett, 2004). There is thus ability for reciprocal interaction, but the agent does not necessarily have magical powers to intervene in everyday life. Simon for instance describes his discussions with God as helpful in terms of having a partner to ventilate his thoughts with, rather than thinking that God literally solves his problems. The term “bodiless” also emphasizes the socio-perceptual aspect, in the sense that

4 To illustrate the overall results, other main themes that are not discussed in this article include paranormal experience, ethical issues, emotion processing, rituals, secularisation, existential queries, difficulties, and coping strategies.

FIGURE 1 Thematic analysis.

the agent is rid of bodily cues, and could thus be applied to superhuman as well as human communication over a distance (e.g., over the Internet).

Also, fictional characters from books, movies and computer games were included in the analysis, and these are explored in the third section on imaginary modes. Someone may object that such agents are not considered religious, but in relation to cognitive functioning, mentalizing with traditional agents should not differ from mentalizing with characters from fantasy fiction: just like the popular Hindu goddess Saraswati is perceived as intentional and non-immanent, so is the dragon rider Eragon when Andrew fantasizes about him. Both agents require mentalizing on behalf of the person who wants to gain insight into their minds.

Importantly, the proposal of including unconventional agents is based on an experiential and emotional dimension (cf. Smart, 1989), in contrast to the often-used (and much-disputed) term *belief* (e.g., Banerjee & Bloom, 2014; Norenzayan et al., 2012). The participants in this study have been disinterested in discussing ontological or philosophical convictions (e.g., the existence of invisible agents), although they report being questioned by others who argue that their views of life are non-scientific. It is rather the *experience* of being in relation to a certain invisible agent that comes through as significant.

To limit the scope of this article, the totality of the rather extensive material cannot be presented. Instead, representative quotes have been selected to illustrate reasoning that involves mindreading of invisible agents. Several

participants thus share the same type of reasoning. The table below offers an overview of all participants, and those who are portrayed more closely have been marked out in bold type, and fantasy proneness is marked out by an asterix. Elise has not yet fulfilled all parts of the study, due to a period of personal distress, but is still included since she has reported to involve in invisible relations, and is fantasy prone.

TABLE 1 *Overview of participants*

Code name	Orientation (emic description)	Invisible companions described
Adilz	Existential contemplation*	Characters from computer games
Anastazia	Christian, spiritual*	God, spirits/ghosts
Andrew	Christian*	Characters from fantasy literature
Annie	Seeker (post-Christian) *	Characters from computer games and literature (previously also Jesus)
Bilal	Muslim*	God, animated movie characters
Boyan	Muslim*	God, spirits/ghosts
Catzzy	Spiritual*	Characters from computer games and animated movies
David	Christian, spiritual*	God, mythological characters
Edgar	Christian*	God, spirits/ghosts
Elise	Satanist*	Demons
Erik	Christian	God
Frank	Spiritual*	Personal fantasy characters, felt 'presences'
Gustav	Christian, Buddhist, spiritual*	God, the Buddha, spirits/ghosts
John	Spiritual Christian	God, angels
Leonardo	Existential contemplation*	Characters from computer games, idols from popular culture
Mina	Christian	God, saints
Simon	Christian	God

* Religious orientations and invisible companions described by the participants in interviews.

Empathy Imbalance and Emotional Coherence

It has been described above how affective empathy is expected to function well, while cognitive empathy (ToM) is reduced in autism, and such accounts are also recurring throughout the interviews. Leonardo for instance describes his childhood frustration of feeling people's dislike, without knowing how to gain their approval:

When I got the diagnosis, both my mum and [the psychiatrist] who gave me the diagnosis said that my conviction [that everyone thought I was ugly and difficult] was because I had autism, but now later I know that this is what people have thought about me. I didn't make a wrong analysis of the situation, I have felt, the feeling I got that they thought that I wasn't normal or that I was a pain and that they didn't want me there, was actually correct. So I definitively know that I can ... that's something I can say that I have the ability for, feeling the atmosphere.

A brief look at relations to animals may shed further light upon such empathy imbalance. Many autistic individuals are fond of animals, and Attwood (2006) remarks that animals and nature are the most common special interests in HFA individuals. Attwood also notes that animals may function as substitutes for peers, which Temple Grandin confirms in her account that "[a]utism made school and social life hard, but it made animals easy" (Grandin & Johnson, 2005). Pavlides (2008) moreover describes how animal-assisted interventions have been successful for developing social skills in autistic individuals.

Animals are also brought up in the interviews: Annie depicts her many pets as her best friends, Erik expresses that Christian ethics should include animals, and Catzzy dreams of becoming a veterinarian. When asked why animals are so special to her, Catzzy describes that she understands them better than humans because animals are less complicated to interpret:

I mean I don't know, they are easier to, I've always understood animals better than people. Perhaps because animals express themselves easier... But you kind of see it, with humans you sort of have to, you kind of, well now they are wrinkling their nose that way and now he's stretching that way so now it has to mean kind of a thousand different combinations. While animals, it's like boom [snapping her fingers] and you know what they want. So it's kind of, it was always easier and like dogs that were shy of people were always attracted to me.... I don't know what it is but ... I connect much better with animals.

This account could be rephrased in emotional terms: while humans have the ability to disguise their emotions (e.g., smiling despite being annoyed) and express sarcasms (e.g., being offensive while laughing), animals are physically and emotionally coherent: an angry dog growls, a happy dog wags its tail. In Catzzy's words, "you know what they want". Considering the discrepancy between emotional and cognitive empathy, ambiguous communication likely becomes difficult to interpret, whereas coherence between affective and cognitive input—such as in animals—likely reduces effort. This argument can also be applied to invisible agents, as we will see further ahead.

Next to verbal statements from the interviews, the participants have filled out the IRI-scale, and the results confirm that the participants engage emotionally in others. The 7 items in the empathic concern subscale are of relevance here; e.g., "When I see someone being taken advantage of, I feel kind of protective towards them" (scored on a 5-point Likert scale). In order to test differences in means between the autism group and the comparison group, two unpaired *t*-tests were performed. Since Elise has not yet filled in this scale, one matched participant has correspondingly been removed from the comparison group, leaving 16 participants in the autism group and 16 participants in the comparison group. Results revealed no significant difference between the autism group ($M = 19.8, SD = 4.1$) and the comparison group ($M = 18.4, SD = 4.6$) on empathic concern scales scores ($t = 0.9359, p = 0.36$).

While these results should be interpreted with caution due to the small group sizes, it is interesting that there seemingly are no significant differences on affective empathy scores between the participants with autism and the matched controls; if anything, the autism group scored descriptively higher. These results are compatible with the interviews, where the participants report that they register emotions and care about the wellbeing of others.

Reading Invisible Minds: Bodiless Communication

Similar to Leonardo and Catzzy, many participants report that communication face-to-face is both difficult and exhausting. It is however notable that all participants in the study give examples of mental states in invisible agents, such as gods, angels, and spirits (and—as we shall see in the next section—other imaginary characters), and their reasoning suggests that complexities may actually be bypassed when considering intentionality in these agents.

The reasoning of Anastazia is illustrative of such mindreading. She describes herself as Catholic and psychic, and argues that traumatic deaths may cause spirits to become stuck in time and space. She seems to experience such spirits on a daily basis, and describes how manifestations depend on how much attention they get:

[I]f they try to talk to you and they try to make you see them and you ignore it or you just don't notice it, then they understand that okay, you are the wrong person to try and then [they] will move on, but if they do something and you react to it, then they know that you see and hear and then they will go on and on until you give them what they want. So the more attention you pay to them, the worse it will get, there will be more activity around you, but if you ignore it and pretend like it never happened, then it goes away.

Based on this notion, she adapts her own behaviour to the perceived minds of these spirits, and describes how she even challenges them to relocate objects in her home because it excites her.

Mina is also Christian and passionately describes his relationship with Jesus. This inner dialogue seems to be constantly on-going, and he describes how Jesus is with him all the time:

[H]e is with us in the room, that's actually what I think that he's sitting next to me now listening to what I'm saying, so he is with us Jesus in the room. And ... he's listening to what I'm saying, and he, he may think whatever he wants, I mean he can give me different signs, if I'm saying anything wrong, then I feel that no this is wrong, I have to tell it in another way. Then he's telling me, but it doesn't show.

It is noteworthy that Mina describes mindreading through feelings. Mina's reasoning also gives the impression that the perceived emotions, attitudes, and values of Jesus are in harmony with his own. This is not always the case with other people, Mina for instance spends much time worrying about the brutalities that the Islamic State have directed towards Christians in the Middle East, and he explains how Jesus is aligned in this concern: "For instance, he now burns inside his heart when he sees people like IS, ISIS, and the Islamic state and these people who hurt each other, he is really sad, because he didn't teach us so." Overall, there are no signs of perceived conflicts between the participants and their invisible companions in the interviews, and it is plausible that mental representations of superhuman agents that correspond to one's own feelings are experienced as less effortful than processing of human relations.

John similarly describes how God interacts with him through feelings of right and wrong. He calls himself a "spiritual Christian", and when asked about the starting point for his current view of life, he responds:

I think it has developed because I, it kind of happened a couple of times that when I, if I did something that felt morally right or something, and then I sort of felt like I got quite happy, I was energized and it kind of felt like the world was more with me. It's like something agreed with what I did and said "that's good", gave me a pat on the shoulder and kind of "you did something right" and that I think developed into me doing something according to ... God.

John thus feels that God thinks that he did something right. In comparison to people—who may verbally tell you that they approve, despite thinking the opposite—John's interpretation of God's mind comes through as harmonized.

Another example of how religious communication may function as moral guidance is found in Annie. She describes her childhood Jesus as "kind of an older brother who's up in heaven, guiding me through life and sometimes giving me good fortune, and responding to my prayers." This quote reflects the important aspect of goodwill, which is how most agents are described in the material.⁵ Boyan, who is a Muslim, for instance explains that her wishes may be declined, but only because Allāh has something better in mind for her:

Well ... you could pray to ... get one more cup like this [lifts up her tea cup]. And perhaps then if Allāh doesn't listen to that prayer then you will get a better yes later to something else that you'd rather want. So it's kind of, when you go to [the store] looking, and the object is not on discount, then you might get a better yes later when you find [another object]. This is the one I'm having, you will always get a better yes later from God.

When she finally gets something that she desires, she infers that it was due to the goodwill of God. Her interpretation does not seem to be based on emotions, but rather on teleological reasoning (i.e., meaning making; see Kelemen & Rosset, 2009): Allāh is benevolent, and there is thus a good reason for why things may not instantly go her way.

Also John argues that benign intentionality directs causality, such as when ascribing his own survival in serious incidents to guardian angels:

5 There are also a few cases where fright is described. Anastazia, Boyan, and Gustav, who all describe themselves as psychic, for instance, describe being scared by spirits. These are however not interpreted in terms of malevolence; it rather seems to be the fact that the spirits show up unexpectedly and cannot be controlled which they experience as unpleasant.

I mean, I believe that there are kind of guardian angels because it has happened a lot of times that I've been sort of close to dying, like a lot of times and I've always made it, somehow ... I mean a fifty-fifty [percent] chance of dying or not.... And then it somehow feels like there's something that ... that, I don't know ... influences things.

His survival is thus interpreted as meant to be, due to invisible willpower.

The reasoning of these participants thus indicates that their preferred invisible agents are perceived as cognitively and emotionally coherent, and the affective component comes through as significant for interpreting what they have in mind. This result diverges from previous expectations of difficulties forming mental representations of superhuman agency. Further ahead, it will be argued that the absence of bodies actually may facilitate social cognition in autism.

Imagination and Fantasy Proneness

During the study, it turned out that several of the participants who describe themselves as *spiritual* were referring to alternative, superhuman characters. Gradually, a whole pantheon of bodiless agents appeared, and these are in turn part of various imaginary worlds that often are inspired by popular culture. It appears as if the boundary between reality and imagination is thin in these participants, and they describe transferring mentally between different dimensions, which will be referred to as *empirical* and *imaginary* realities.

The case of David is illustrative. He describes himself as Christian and spiritual, and has a profound interest in mythology and creative arts:

I think that I've always had an interest for ... the supernatural and the magical that is related to me being a believer, and then I've always liked acting, writing and storytelling. And that storytelling you could say is grounded in genres like mythology but also fantasy, which then spread to include other genres that I would like to take part in.

Interestingly, David connects his interest in spirituality and imagination to autism:

I think it's because ... I've always had my spirituality and that interest, but then I also had my own sphere and an understanding for my Asperger's and an understanding for the fact that I see situations differently. And I kind of know that ... it's not a miracle but it's an understanding for who

I am that connects me to the magical world. But also the fact that I've had spiritual experiences, and having Asperger's and this typical trait that is a strong ability for imagination.

When asking David to compare the reality of the room we are in with his imaginary mode, he emphasizes that both of them feel real to him, and later concludes that things that are experienced as genuine for one person do not have to be true for someone else. This is an illustrative example of how experience is made central by the participants.

Voluntary transition between different realities is also found in the accounts of Adilz, Anastazia, Andrew, Annie, Bilal, Boyan, Catzzy, Edgar, Elise, Frank, Gustav, and Leonardo. The cognitive style of these participants compares well with the *fantasy prone personality type* (Wilson & Barber, 1981, 1983). Such fantasizers are characterized by spending much time in a world of imagination, day-dreaming frequently, absorbing into fiction, and having sensory experiences that are interpreted as paranormal. Catzzy for instance eagerly portrays her favourite fantasy characters, such as goddesses, magicians, and cartoon characters derived from computer games and movies, and also describes that she has had imaginary friends since childhood. Approaching adulthood, she interacts with other invisible minds, such as the enigmatic deity Nocturnal from the computer game Elder Scrolls:⁶

Nocturnal is kind of mystical in a confident way and still you know that if you would make her angry all hell would break lose! But still if you make her, do her bidding, you know that you'll always have that extra luck that you need. Which in my experience playing Skyrim has helped me, many times actually!

The relationship is thus described as mutual: As long as Nocturnal is kept satisfied, Catzzy experiences that she is supported in her gaming.

Repetition and pace also come through as significant. It seems common for autistic individuals to experience that people are talking too fast, and Catzzy appreciates the ability to communicate at her own pace, such as pausing a game to think and rewind: "I often save and pause to see if there is anything shocking, and then I sit there like a couple of minutes and just [gasps], what

6 Nocturnal is one of the so-called *Daedra Lords* (powerful deities that are worshipped by mortals as well as other deities) and is considered "the patron of all things secretive" (November 18, 2017. Retrieved from http://elderscrolls.wikia.com/wiki/Daedric_Princes).

just happened?” Asking her if there are similarities between animals and her favourite game characters, Catzzy replies:

I mean, it's a game so they have to be more distinct and then generally you just hear, it's so much easier to hear their intonation.... I actually don't know why that is, it might be because I've replayed these quests several times so I learned to recognize their tone of voice, of these [characters]. And being the saving maniac that I am, I often save as much as I can so I can take different routes and see how they react.

In other words, games allow for social interaction in her own pace, there are no complex mimics or bodily expressions to interpret, and she is able to repeat and practice until the agent becomes familiar and predictable.

Such qualities can also be found in literary contexts. Annie for instance describes that she prefers books to movies because she can read the same page over again without losing flow. Also Andrew is a keen reader of fiction, and fantasizes about characters from fantasy literature: “Until I was fourteen years old, when I finished reading the Harry Potter-books, I believed in unicorns.” He also describes how absorption draws him and other fantasy devotees into a fictive world:

I can't say that they are living with me but when you go through a long story, you're reading a book or a trilogy like *The Lord of the Rings* and you feel like you are on the journey that Sam and Frodo are on and you experience everything, it's sort of like people on the internet sometimes say that “Oh, I wish I actually went to [the magic school of] Hogwarts, it would be so amazing!” If you actually read the books you would be there all time, you were by their side, you follow their story, that's what [the author] J. K. Rowling said in a response.

Like for David, Andrew's statement can be understood as a switching between realities: while reading about Harry Potter, and while fantasizing about flying a unicorn, the experience is realistic. When switching back to the empirical reality, they are not “living with him”.

Interestingly, Andrew describes religion as yet another mode of storytelling: “When you get stuck in literary works you usually think that you are in *that* world. But the Bible is also a narrative, but in *our* world.” The imaginative component in religion thus seems appealing for him, similar to Catzzy who thinks that the Christian God is “boring” compared to the “cooler” Asa Gods. Importantly, fictive and religious narratives contain descriptions of behaviours

and minds, likely making agents predictable for individuals who struggle to understand social cognition.

Such predictability is highlighted in the interview with Frank. He calls himself spiritual, and describes shifting into imaginary modes when he is bored:

Well, I can lie in bed and if I'm thinking that there is a zombie walking around in the living room, then that's how it is for me, because my imagination can be so strong that it ... I can become convinced about it, even though I know that it's not happening, a part of me can still be convinced.

Frank has constructed an imaginary world with detailed characters. He says that he often senses invisible presences in his room, and using his imagination, he has created personalities and narratives from these. He also articulates the idea that bodiless characters are easier to understand than other humans, "because it's like, they think the same way as me, anyway because I don't know how anyone else thinks, so they all have sort of the same way of thinking, and then it's much easier to imagine how they work. Because I control them."

Leonardo likewise uses his imagination to escape boredom. In his childhood, the fantasy world of *Gielinior* provided a means of replacing loneliness with adventurous quests and magic: "I used to play Runescape and I used to fantasize about that in school, instead of talking to others, I could be bothered when others wanted to talk to me because I would rather stay in my imagination and sort of built my own world." Now in his teens, Leonardo fantasizes about idols and role models, taking on the character of a person he admires or imagines how that person mentors him. These characters seem to fill a supportive role, and like Frank he describes them as distinct and predictable: "And then I can control what they are saying. And I understand what they [want], it's not as difficult to interpret as it is when I'm talking to people in school or in reality."

This unforeseen theme of imagination is clearly accentuated in the material. The participants describe that fantasizing is used for pleasure, practise of social skills, empowerment, and escapism, and it likely connects them socially and emotionally to other fantasizers and gamers. Emotional coherence, predictability, and a notion of benevolent minds, mixed with intense imagination and enchantment, generates "imaginary realities" that come through as radically different from the empirical world where multiple—and often contradictory—social input needs to be synchronized and interpreted. The primary argument, which will be developed in the discussion below, is that imaginative autistic individuals may be attracted to religious and imaginative

contexts, and the agents involved in these, because of qualities that facilitate social interaction.

Discussion

Two novel hypotheses concerning invisible communication and imaginary realities in autism have been extrapolated from the empirical material presented above. The first hypothesis proposes that for autistic individuals, mental representations of bodiless agents offer a case of more effortless communication relative to interaction with peers since a) there are no facial, vocal, or bodily cues to interpret in order to understand what the agent intends, b) the agent is likely to resemble oneself, c) the processing of communication is adapted to one's own pace, and d) emotional and cognitive input is aligned.

Rather than merely emphasizing mental aspects of mindreading, this hypothesis also accentuates the impact of sensory and emotional input, and these aspects have (to the best of my knowledge) never been explored before in relation to religiosity in autism. Reddish and colleagues (2016) do however suggest that “gods may be arguably easier to interact with than humans: communication is one way and does not require complex deconstruction of social behaviours in a particular social situation to understand and predict the behaviours that are unfolding before you. Gods do not use sarcasm” (Reddish et al., 2016, p. 108). These participants yet demonstrate that invisible communication may be perceived as reciprocal, and emotional processing appears to be central in this process: they feel what the agents intend and want. Scholars have argued that people use their own beliefs to understand superhuman agents (Epley, Converse, Delbosc, Monteleone, & Cacioppo, 2009, p. 21536), and persons opposed to abortion are for instance likely to report that God is equally negative (Gervais, 2013, p. 385). Such projections are likely vital also here—Frank and Leonardo even comment that they “control” the characters they fantasize about. Importantly, the agents described in this study come through as benign and trustworthy, and put together, these aspects likely contribute to reducing the effort put into mentalizing.

In the second hypothesis, it is maintained that imaginary realities are desirable because of qualities that similarly facilitate social cognition. Put somewhat drastically, the participants describe their escape from a rather dull, empirical world where unpredictable people project contradictory signals, to absorb into enchanted worlds with characters that are interesting, predictable and benevolent. It seems as if the combination of imaginary worlds and bodiless

agents—derived from either traditional or modern sources—supports autistic individuals in practising and predicting social behaviours.

The surprising fact that material from 13 of 17 participants suggest notable fantasy proneness may reveal something important about the sample: It is possible that imaginative autistic individuals find appealing qualities within religion, spirituality, and fantasy fiction, such as magic, enchantment, sensational characters, and narratives that motivate and support mindreading. This would explain why these specific individuals volunteered for the study. It has also been proposed previously that curiosity may impact autistic individuals to reason on intentionality, and interesting agents may simply be more intriguing to interpret (Visuri, 2012, p. 375; cf. Vonk & Pitzen, 2017). It however remains to be explored how general a trait fantasy proneness is in autism; if it is present all along the spectrum, or only relates to a specific subgroup.

Turning to neuroscience, the hypotheses presented here align well with research on sensory dyssynchrony in autism. One of the central theories in this field of research concerns the integrating function of the *multisensory binding window*, which contributes to temporal synchronization of rapidly changing sensory input: light travels faster than sound, but the incoming signals are bound together through a time window during which the brain integrates the input into a coherent experience (Wallace, 2012). There is however compelling evidence that this time window is prolonged in autism, and attribution of stimuli from various modalities is therefore received separately (Brock, Brown, Boucher, & Rippon, 2002; Foss-Feig et al., 2010; Wallace, 2012). Consequently, audiovisual input is not formed into a perceptual gestalt, which leads to fragmentation and incoherence in cross-modal contexts. The hypotheses presented here correspondingly suggest that contexts without cross-modal input are preferable for autistic individuals.

Scholars have similarly argued that overwhelming information from eye contact, body language, and intonation makes interaction online preferable for autistic individuals: “Once autistic people can handle a keyboard, many of them can explore a space where you never actually need to confront anyone face-to-face.” (Hacking, 2010, p. 650; cf. Davidson & Orsini, 2013; Smith & Sharp, 2013). Textual narratives have also been described as more manageable than movies, which are cross-modal. The literary scholar James McGrath (2016), who is also diagnosed on the autism spectrum, for instance describes how literature has supported him in learning about human behaviours and relations without distraction from facial recognition, while also being in control of the pace.

Ultimately, embodied “noise” seems to complicate social communication for autistic individuals, and narratives and imaginary modes thus appear to provide attractive alternatives to real life, cross-modal interaction. Summarizing

the arguments, several aspects of religiosity seem to relieve cognitive load, and these aspects appear to attract the participants in this study. The conclusions made here thus differ significantly from previous proposals on the relation between autism and religion, and an important distinction in this study is the exploration of experiences, rather than beliefs. Boyer (1997) suggests that notions of reality actually are underpinned by experience rather than ontological status, and such a stance widens the concept of religion in the CSR, opening up for the study of fictional components that likely are vital in contemporary religiosity.

Methodological Considerations and Suggestions for Future Research

This case study, which is limited to exploring traits in a strategically selected group rather than a whole population, highlights a number of novel aspects that call for further consideration in the cognitive study of religiosity in autism. To begin with, sensory processing is included in the analysis of mentalizing difficulties in autism. Quantitative testing may shed light on the generalizability of the hypothesis on bodiless agents, such as assessing possible differences in mindreading of sensory multimodal and unimodal agents.

Second, the narratives presented here bring forward hitherto under-researched aspects of imagination in autism. Much attention has been directed towards ToM-abilities, but the differentiation between *social imagination* and *imagination per se* opens up for CSR-researchers to study religiosity as a construction of imaginary realities, also in relation to people outside the autism spectrum.⁷ Importantly, this brings with it a shift from previous studies on ontologically grounded beliefs, to exploring experiential dimensions that rely on the ability to sidestep empirical principles. Such a change may radically affect methods and approaches when studying cognitive mechanisms involved in religiosity.

Third, mentalizing is a complex construct, and needs to be assessed through multiple measures. The separation between agency detection and the attribution of appropriate mental states has for instance not yet been considered in autistic individuals. McNamara and Butler (2013) argue that agency detection is less complex than intuitive mindreading, and possibly this detection of agency, combined with slower, reflective thinking, underlies teleological reasoning

7 It should be emphasized that the psychological description of fantasy-proneness crosses over diagnostic boundaries, and thus includes both autistic and non-autistic individuals.

in autistic individuals who label themselves religious. Overall, the interaction between fast and slow processing needs to be acknowledged and reflected in CSR-methodology, keeping in mind that the naturalness hypothesis of religion is probabilistic: Reflected thinking might be used either to dismiss intuitions, or to compensate for the absence of such, depending on the motivation.

Fourth, the study of atypical cognition challenges the assumptions and tools that we bring into research. Standardized scales and tests that were designed for the majority population may wholly miss the target when used on an autistic population, and we thus risk comparing “apples and pears” (Visuri, 2018). Autism is a heterogeneous and complex phenomenon, and through collaboration with autistic subjects, subtle but vital aspects that have not been previously considered may surface.

Concluding Remarks

Similar to previous studies on religious cognition in autism, this study draws on the naturalness hypothesis of religion and theories on mentalizing difficulties in autistic individuals. The difference, however, is the focus on *theism* and *religious experience* rather than atheism and ontological beliefs. Gradually this exploration has brought forward aspects that have not been previously considered.

Contrary to popular notions that individuals on the autism spectrum will find mental representations of superhuman agents perplexing, the participants in this case study describe such bodiless agents as predictable, emotionally coherent, and benevolent. Furthermore, the idea that autistic individuals cannot be imaginative is challenged: these participants do struggle with *social imagination*, while fantasizing and daydreaming about minds on their own terms is described as pleasurable. In other words, these autistic individuals do interpret and interact with invisible minds, and motivation—rather than ability—to mentalize and understand interesting minds seems central in this endeavour. Also experiential and emotional dimensions come through as significant, in contrast to ontological deliberations on what the participants believe to be true.

Importantly, these participants do not seem drawn to religion and the supernatural in spite of—but *because of*—the superhuman agents that figure in these contexts. This is an interesting turn in the cognitive study of autism, theism, and atheism, and continued attention is required in order to establish how general a tendency this is on the larger autism spectrum.

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