

### Abstract

The present study explored the mediating role of cognitive and affective components of empathy in the relationship between happiness and positive and negative affect in adolescents with Asperger Syndrome (AS) and their non-AS peers. For that purpose, we measured empathy, subjective happiness, and affect experienced by a group of 42 adolescents with AS compared to 44 of their non-AS peers. Adolescents in both groups were matched on age, sex, and IQ, and were administered a battery of measures assessing their self-reports of empathy, perspective-taking, subjective happiness, and positive and negative affect. Findings revealed that adolescents with AS, in contrast to their peers without AS, reported less subjective happiness, less positive affect, and lower affective balance. No differences were found between the two groups on negative affect. A mediating role of both cognitive and affective components of empathy was found between happiness, positive affect, and affective balance experienced in relation to AS. Theoretical and practical implications of these results are discussed.

**Keywords:** Asperger Syndrome, happiness, affect, mediators, empathy

## Perspective-Taking and Empathic Concern as Mediators for Happiness and Positive Affect in Adolescents With and Without Asperger Syndrome

In recent decades, a marked shift has occurred in the way in which researchers view and approach the field of psychology. With the advent of the “Positive Psychology Age,” researchers have turned their attention to exploring the mechanisms and processes underlying happiness and positive mental health (Seligman and Csikszentmihalyi, 2001). Most of the research conducted to date has focused on understanding why people identified as “typical” are happy and doing well, and on elucidating the factors that lead to their happiness and well-being (Cheng and Furnham, 1999; Diener and Seligman, 2002; Gamble and Gärling, 2012; Tkach and Lyubomirsky, 2006), while research on people with disabilities or developmental disorders such as those with autism spectrum disorders (ASD) like Asperger Syndrome (AS) continues to be observed from a psychopathology perspective. To our knowledge, there are no studies examining happiness and well-being among individuals with AS. Moreover, apart from the studies regarding comorbidities with affective disorders, such as anxiety or depression (Ghaziuddin, Weidmer-Mikhail, & Ghaziuddin, 1998; Kim, Szatmary, Bretson, Streiner, & Wilson, 2000; Rieske, Matson, Ehrenreich-May, & Kozlowsky, 2012; Whitehouse, Durkin, Jaquet, & Ziatas, 2008), there exists a paucity of research examining the affect experienced by adolescents with AS.

### **Happiness and Asperger Syndrome**

According to Lyubomirsky (2001) in almost every culture, people consider happiness as one of their most important goals in life. Research has demonstrated the extensive benefits of "being happy." For example, Lyubomirsky, King, and Diener, (2005) showed a positive relationship between happiness and different variables, such as personal and academic success, and physical health. In this study, we have employed

Lyubomirsky's definition of happiness, which comprises both cognitive (how people see themselves compared to others) and affective components (how they feel).

Based on the extant literature, the question "Are adolescents with AS happy?" has not yet been addressed. AS is an autism spectrum disorder mainly characterized by impairments in social interaction due, in part, to deficits in Theory of Mind (ToM) and empathy (Blair, 2008; Dziobek et al., 2008; Rogers, Dziobek, Hassesntab, Wolf, & Convit, 2007; for a complete review on this topic see Smith, 2009a). Like autism, the prevalence of this syndrome between boys and girls is unequal. Some authors suggest a ratio of 4:1 for boys (Ehlers and Gillberg, 1993). The core of this syndrome are social impairments defined by features such as difficulties in recognizing emotions, avoidance of eye contact, and/or absence of emotional reciprocity (Tureck and Matson, 2012). Individuals with AS also demonstrate restricted interests (usually topics considered awkward for their age) as well as repetitive behaviors and strong adhesion to routines (American Psychiatric Association [APA], 2000). According to the criteria proposed in the Diagnostic Statistic Manual of Mental Disorders (DSM IV-TR, 2000) to diagnose Asperger Syndrome it was necessary to have a history of normal language development and absence of cognitive delay. The recent DSM-V (APA, 2013) no longer considers AS a specific disorder, but includes it inside the continuum of the autism spectrum disorders.<sup>1</sup> Typical observable characteristics of the syndrome during adolescence include: poor communication skills regardless of having an excellent vocabulary, intense interests and pursuits, problems with social flexibility and with self-organization, and a preference to engage in self-interest activities (Howlin, 2004). Despite this and in contrast to people with autism, people with AS are interested in connecting with others (Happé, 2005; Tureck and Matson, 2012).

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<sup>1</sup> There exists some controversy in the scientific community regarding this decision (Ghaziuddin, 2010)

Adolescence is a particularly important time in the life span in which to examine happiness and well-being due to the myriad of changes that occur, particularly with regard to developments in personality, self-concept, and the growing need for autonomy (Graça, Calheiros, & Barata, 2013; Nilsen, Karevold, Roysamb, Gustavson, & Mathiesen, 2013). For the majority of individuals with AS, adolescence is a time when they become more aware of the personal characteristics and challenges they have (Attwood, 1998; Holliday, 2004; Kuusikko et al., 2008). As a consequence, they face new challenges as they begin to incorporate their syndrome into their own personal identity. The social support that adolescents with AS receive during this time plays an important role to lessen the negative impact of this process (Kuusikko et al., 2008).

Empirical evidence demonstrates a close link between happiness and social relationships (Chaplin, 2009; Diener and Seligman, 2002; Tkach and Lyubomirsky, 2006). Studies on adolescents' happiness have revealed that close friends and social skills each play a role in the happiness of individuals during this developmental stage (Demir, Jaafar, Bilyk, & Raduan, 2012). Additionally, psychosocial variables such as low stress have also been linked to happiness in adolescence (Natvig, Albrektsen, & Qvarnstrom, 2003). Merging this research on adolescence with the research documenting the social impairments of individuals with AS and the difficulties that they confront during adolescence, leads to questions regarding the happiness of adolescents with AS compared to typically developing adolescents. In other words, what are the experiences and correlates of happiness for adolescents with AS compared to adolescents without AS? These questions were addressed in the present study by examining happiness and other affective characteristics, such as affect experienced. In order to further understand the mechanisms underlying positive functioning in adolescents with AS, the study sought to identify whether happiness and the affect

experienced were influenced by other psychological variables, for example, via mediating mechanisms. A mediating variable is a variable that exerts an indirect effect on the relationship between an independent one (in this study, having AS) and a dependent one (in this study, happiness and affect; Wu and Zumbo, 2007). Hence, via mediation analysis we aimed to explore the potential mediating role of cognitive and affective empathy on happiness and affect in relation to AS. Answers to these questions have important implications for the understanding of the affective lives of adolescents with AS and for the development and implementation of prevention and intervention programs for these youth.

### **Affect and Asperger Syndrome**

One of the main features of happiness and well-being, undoubtedly, are the emotions experienced. The frequency and degree of positive affect and joy has been found to be one of the main components of happiness (Argyle and Crossland, 1987). The affective balance (the balance between positive and negative affect) has been traditionally considered a component of well-being (Diener, Sandvik, & Pavot, 2009; Sanjuán, 2011) or even well-being itself (Bradburn, 1969). Current research has found a strong link between happiness and positive affect with both theory and research indicating that what is related to happiness is not the intensity of the affect experienced but the frequency of the experiences of positive affect (Diener et al., 2009; Lyubomirsky et al., 2005). According to Watson, Clark, and Tellegen (1988), affect is defined by two distinct dimensions: positive affect and negative affect. Positive affect refers to the extent in which a person is feeling enthusiastic, active, and alert. It comprises a variety of positive moods and/or emotions. In turn, negative affect is considered a set of negative moods and feelings characterized by distress and aversive states.

In regards to the current evidence on affect among individuals with AS, there are two literatures from which we can draw. On the one hand, studies have focused on the high prevalence of affective disorders (e.g., depression or anxiety) among this population (Kim et al., 2000; Kuusikko et al., 2008; Rieske et al., 2012). As discussed previously, adolescence is a critical period that can become extremely difficult for people with AS (Attwood, 1998; Kuusikko et al., 2008; Stanton, 2004). As they realize their "differences" with others, they experience problems at school and struggle with social relationships, and their difficulties become more salient as relationships with others become more important during adolescence (Durkin, 1995; Gilbert, 2012; Oberle, Schonert-Reichl, & Thomson, 2010; Storch et al., 2012). This situation often leads them to cope with sadness, depression, and anxiety problems (Ghaziuddin et al., 1998; Hedley and Young, 2006; Kuusikko et al., 2008; Whitehouse et al., 2009). On the other hand, studies have focused on the impairments in emotional recognition manifested by children, adolescents, and adults with AS (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001; Golan, Baron-Cohen, & Golan, 2008; Hall, Doyle, Goldberg, West, & Szatmari, 2010; Kuusikko et al., 2009; Law Smith, Montagne, Perret, Gill, & Gallagher, 2010; Rutherford and McIntosh, 2007). These impairments are usually explained as being a result of their deficits in ToM and their "incomplete" empathic abilities (Baron-Cohen, 1995; Baron-Cohen et al., 2001; Dziobek et al., 2008; Rogers, et al., 2007; Smith 2009a). It also has been noted that individuals with AS experience some impairments with receiving and expressing affection (Atwood, 1998; Sofronoff, Eloff, Sheffield, & Atwood, 2011), and recent studies have suggested that extreme sensitivity to physical touch is likely to be the cause (Blackmore et al., 2006; Sofronoff et al., 2011). Although there is a wealth of empirical evidence that documents the psychopathology and consequences of the deficits of individuals with

AS (Ghaziuddin et al., 1998; Kuusikko et al., 2008; Whitehouse et al., 2009), there is a paucity of evidence documenting the affective lives of adolescents with AS beyond their deficits. Indeed, the question "How do adolescents with AS feel?" remains unanswered in part, due to the common belief that AS is strongly associated (and even overlapped) with alexithymia (Fitzgerald and Molyneux, 2004). This construct, first described by Sifnéos, refers to an inability to focus on internal events, difficulties in identifying and describing feelings, difficulties distinguishing feelings from the bodily sensations of emotional arousal, and impaired symbolization (Sifnéos, 1973). However, some authors have argued that this could be a wrong assumption and suggest that individuals with AS actually have an emotional life but process emotions in a different way (Berthoz and Hill, 2005).

### **Relations Among Empathy, Positive Affect, and Happiness**

Regarding the suggested link among happiness, positive affect, and social relationships, it is important to include a discussion on empathy. Empathy is the basis of social relationships and has been identified as the "heart of human social behavior" (Smith, 2009a, p. 489). Most scholars currently agree that empathy comprises two distinct dimensions: a cognitive component, related to the ability to adopt another's point of view; and an affective component that entails feeling an appropriate emotion in response to another's emotions (Baron-Cohen and Wheelwright, 2004; Blair, 2005, 2008; Davis, 1980, 1983; Decety and Jackson, 2004, 2006; Dziobek et al., 2008; Reiniers, Corcoran, Drake, Shryane, & Vollm, 2011; Smith, 2006, 2009a,b). Researchers examining empathy have typically distinguished these two components when measuring and studying empathy (Davis, 1983; Dziobek et al., 2008; Jones, Happé, Gilbert, Burnett, & Viding, 2010; Rogers et al., 2007).

Although there are just a handful of studies examining the relation between empathy and well-being (Hills and Argyle, 2001; Shanafelt et al., 2005), some previous research has shown an association between the cognitive component of empathy (i.e., perspective-taking) and well-being (Shanafelt et al., 2005). This knowledge, together with the documented impairments in empathy of individuals with AS (Baron-Cohen and Wheelwright, 2004; Dziobek et al., 2008), led us to ask the question: Is empathy related to happiness and affect among adolescents with AS?

### **Current Study**

The present study takes an exploratory approach and aims to address the following questions: How happy are adolescents with AS? What are their levels of positive and negative affect? Are their empathic abilities associated with the levels of happiness and affect? If so, could the relationship between having Asperger Syndrome and happiness be mediated by empathic abilities? Furthermore, do these empathic abilities mediate the relationship with affect?

## **Method**

### **Participants**

The sample consisted of 42 adolescents diagnosed with AS (38 boys) matched on sex, age, and IQ with 44 neurotypical controls. The average age was 13.20 years ( $SD = 2.46$ ) for the AS group and 13.7 years ( $SD = 1.81$ ) for the control group. The average IQ of the group with AS was 104.37 ( $SD = 11.8$ ) and 108.46 for the control group ( $SD = 12.8$ ). There were no significant group differences found for either age or IQ ( $p > .05$ ). Both the participants with AS and the participants without AS were enrolled in grade levels that corresponded to their chronological age.

To be eligible to participate in this study, participants with AS had to have been diagnosed with AS by a psychiatrist or a clinical psychologist according to the criteria

established by DSM-IV or DSM IV-TR (APA, 1994, 2000), and have an IQ above 85 on the Weschler Intelligence Scale for children (WISC III; Weschler, 1991).

Additionally, we asked their parents to complete the Australian Scale for Asperger Syndrome (ASAS; Attwood, 1998). Scores obtained for each participant confirmed the syndrome. Neither the parents nor the psychologists reported the presence of an affective disorder. Nevertheless, in order to rule out any comorbid affective disorders, the participants were administered a screening test of mental health (MHI-5; Berwick et al., 1991). None were found, hence all recruited participants were retained for the study.

### **Procedure**

The study presented here was part of a larger study examining the emotional characteristics of adolescents with AS and their parents. The participants with AS were recruited through three Asperger Associations located in the south of Spain.<sup>2</sup> The study, its objectives, and its methodology were initially presented to the associations' psychologists and leaders. Once the associations agreed to participate, we presented the study individually to the parents and asked for their informed consent. Participants were also asked for their consent to participate and then were assessed individually by the first author in a quiet room. Each assessment took between 60 and 90 minutes to be completed. To facilitate the process as much as possible and to generate rapport with the participants, the researcher introduced herself in a friendly way, thanked them for their time and collaboration, and assured total confidentiality for their answers. They were not told the objective of the study, and were told that they were being asked to complete some tests about emotions.

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<sup>2</sup> The associations were located in Murcia, Granada, and Málaga, Spain (with Málaga as the location in which the largest number of participants were recruited.)

Neurotypical controls were recruited at their school (located in Málaga, in the south of Spain). We asked the school principal for permission to administer the surveys, and obtained parental consent for the students to complete the surveys. They were randomly selected according to their age and sex, and were evaluated during school time. The tests were administered in the same way as with the participants with AS. Similarly, the participants without AS were not told about the precise objectives of the study.

The IQ and clinical diagnosis of AS of the participants with AS were provided by the psychologists of the associations. The psychologist from the school provided the researchers with the IQ information of the non-AS participants.

In order to assure that both clinical and control groups understood the emotional words on the tests, a list of synonyms and explanations was created to make sure participants were provided with the same information. None of the participants had low IQ or learning delays according to the clinical reports of the participants with AS and the information provided by the school's psychologist for the non-AS participants, hence, there was no reason to suspect that they would have any difficulty understanding the questions. The order of administration of the tests was counterbalanced for both groups.

## **Measures**

**Perspective-Taking and Empathic Concern Subscales.** Following other studies (Schonert-Reichl, Smith, Zaidman Zait, & Hertzman, 2012; Shamay-Tsoory, 2008; Shanafelt et al., 2005) we used the perspective-taking (PT) and empathic concern (EC) subscales from the Interpersonal Reactivity Index (IRI; Davis, 1980; Spanish adaptation by Pérez-Albéniz, de Paul, Etxebarria, Mostes, & Torres, 2003) to assess both components of empathy. The seven-item perspective-taking subscale assesses the

tendency to take another's point of view (e.g., 'I try to look at everybody's side of a disagreement before I make a decision'). The seven-item empathic concern subscale assesses affective responses, such as the tendency to experience feelings of warmth and concern for others (e.g., 'I often feel sorry for those who don't have the things I have'). Items were rated on a Likert-type scale ranging from 1 = *not at all like me* to 5 = *always like me*. Supportive evidence for the construct validity of the empathic concern and perspective-taking subscales of the IRI has been obtained in previous research. For example, alphas obtained by Davis (1980) ranged from .75 to .68 for PT and EC respectively. The alphas obtained in the study by Schonert-Reichl et al. (2012) were .80 for PT and .74 for EC. For the current study alphas were .63 and .64 for perspective-taking and empathic concern, respectively.

**Subjective Happiness Scale (Lyubomirsky and Lepper, 1997; Spanish adaptation by Extremera and Fernández-Berrocal, 2013).** This scale provides a measure of subjective happiness. It is composed of four questions the participant has to answer on a Likert-type scale ranging from 1 to 7. The first two items ask the participants to characterize themselves (e.g., 'Compared to most of my peers I consider myself...'; 1 = *less happy* to 7 = *more happy*). The third and fourth items characterize happy and unhappy people, respectively, and ask the participant to compare himself to them (e.g., 'Some people are very happy. They enjoy life regardless of what is going on, getting the most of everything. To what extent this characterization describes you?' the Likert scale ranging from 1 = *not at all* to 7 = *a great deal*). Previous studies, such as the one by Lyubomirsky and Lepper, (1999) reported a Cronbach's alpha ranging from .79 to .90. For the present study, Cronbach's alpha was .55 for the group with AS, and .57 for the group without AS.

**Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988; Spanish adaptation by Sandin et al., 1999).** This instrument measures the participant's general affect over the last week. It comprises two subscales: the Positive Affect scale (PA), which contains twenty adjectives describing positive affective states; and the Negative Affect scale (NA), composed of twenty adjectives describing negative affective states. The respondent is asked to indicate the frequency with which he or she has experienced each emotion using a Likert-type scale that ranges from 1= *Nothing at all* to 5 = *A lot*. It should be noted that to make sure the participants understood all the adjectives, they were accompanied by the same examples and synonyms for both groups. This subscale has been validated in youth population (Crocker, 1997). In order to obtain a measure of affective balance, the score on the negative affect subscale was subtracted from the score on the positive affect subscale (Sanjuan, 2011). Watson et al. (1988) reported good alphas for each one of the subscales, .88 for PA subscale and .85 for NA subscale. In this study, Cronbach's alphas obtained for the PA subscale were .77 and .84 for the AS group and the non-AS group, respectively. For the NA subscale the alphas obtained were .61 and .80 for the AS group and the non-AS group, respectively.

## **Results**

This results section begins with analyses examining group differences for all of the variables examined in this study. Following, correlational and mediation analyses are presented. The data were analyzed using the Statistical Program for Social Sciences (SPSS), version 19 for Macintosh. We carried out the mediation analysis using the script for SPSS developed by Preacher and Hayes (2008).

### **Group Differences**

To examine whether differences in empathy, happiness and/or affect experienced existed between AS and non-AS adolescents, we conducted a series of

analysis of covariance (ANCOVAs) with age and IQ as covariates. These covariates were chosen to align with other studies within the field of developmental psychology and developmental disorders (i.e., Golan et al., 2008; Lam and Yeung, 2012). Results from these analyses are presented in Table 1. As can be seen, significant differences between the two groups were found for perspective-taking and empathic concern. According to Cohen (1988) the effect sizes were considered large and small, respectively. Significant differences between both groups were also found for happiness, positive affect, and affective balance. The effect sizes for these variables were medium according to Cohen (1988). No significant differences between both groups were found in relation to negative affect. All differences between groups were due to lower scores among the adolescents with AS compared to adolescents without AS.

### **Associations Among Variables**

Pearson correlations were conducted to examine relations among variables (see Table 2). It should be noted here that the variable AS was coded as "0" for the control group and "1" for the group with AS. The relationship between AS and PT was negative as was the relationship between AS and EC. Relations of AS to happiness and affective balance were also negative. Regarding the empathic variables, both were positively associated with happiness, positive affect, and affective balance. Negative affect was not significantly associated to any of the variables.

### **Mediation Models**

Once we verified the association between all of the variables (except for negative affect), mediation analyses were carried out in order to examine whether the empathic components (i.e., perspective-taking and empathic concern) played a role between having AS and happiness and affect. We used the script developed by Preacher

and Hayes (2008) to estimate the indirect effect of the proposed mediators. Bootstrap procedures have shown several advantages over other methods of testing mediation, for example, they are specially suited to test mediation with small samples since they make less problematic any violation of the assumption of normal distribution of the scores. These procedures are currently recommended in developmental psychology (Dearing and Hamilton, 2006) and allow introducing covariates. Also, they generate confidence intervals around the indirect effects, which in turn increases accuracy. Mediation is assumed to be present if zero does not fall within the interval.

For all of the models tested, confidence interval (CI) was set at 95% with 5000 re-samples. Having AS was always used as independent variable; happiness, affect and affective balance were taken as dependent variables and the empathic variables were used as mediators.

**Using perspective-taking as mediator.** In the first model proposed, the effect of PT on happiness was tested (being happiness the dependent variable and having AS the independent variable). This model is represented in Figure 1 and its results are presented in Table 3, along with all of the models. The indirect effect (IE) via PT was  $-.2129$ , 95% CI =  $-.5016$  to  $-.0315$ . This mediation was partial. We also tested the possible mediation of PT on both affect and affective balance. For positive affect (PA) as dependent variable, PT showed an IE =  $-.1468$ , 95% CI =  $-.3265$  to  $-.0466$ , which indicates it totally mediated the relationship between having AS and PA. Taking affective balance (AB) as the dependent variable, the IE obtained was  $-.1979$ , 95% CI =  $-.4521$  to  $-.0509$ . As occurred for positive affect, PT totally mediated the relationship between having AS and affective balance. The mediation model tested for PT and negative affect did not reach significance.

**Using empathic concern as mediator.** Regarding the positive association also found between happiness, affect, and EC, we tested whether it had a mediating role on them. EC partially mediated between having or not AS and happiness, although its indirect effect was lower compared to PT (IE =  $-.0937$ , 95% CI =  $-.2922$  to  $-.0036$ ). Likewise, the mediation models found for positive affect (PA) and affective balance (AB) as dependent variables also reached significance. On the one hand, for PA, the IE was  $-.0714$ , 95% CI =  $-.1947$  to  $-.0102$ . On the other hand, the IE obtained for AB was  $-.0782$ , 95% CI =  $-.2648$  to  $-.0001$ . Both mediations were partial. As occurred with PT, the mediation model tested for EC and negative affect did not reach significance.

In sum, we found that both empathic abilities - perspective-taking and empathic concern - mediated happiness, positive affect, and affective balance as dependent variables with having AS as the independent variable. Perspective-taking showed a stronger effect on all of the dependent variables (it totally mediated for positive affect and affective balance). EC partially mediated all of them.

### **Discussion**

To our knowledge, this is the first study to investigate the relation among Asperger Syndrome, empathy, and well-being variables, such as happiness and affect. Our main findings are: First, we found that adolescents with AS experience less happiness and less positive affect than their non-AS peers. Second, we found that perspective-taking and empathic concern mediate the relation between having AS and these variables. The present study proposed four questions regarding happiness and affect in adolescents with AS. Each of these four questions and their answers are outlined in the following pages.

### **How Happy Are Adolescents With AS?**

In answer to the first question, "How happy are adolescents with AS?" our results reported less subjective happiness in adolescents who have AS compared to their non-AS peers. Diener and Seligman (2002) tried to find the essential components of happiness and failed to find a necessary and sufficient condition, but did find some necessary "attributes" (attributes shared by the majority of happy people), with adequate social relationships being the most important. Similar results were reported by Tkach and Lyubomirsky (2006), who found social affiliation as the more frequent and important strategy used by people in order to be happy. Studies with adolescent populations corroborate this idea and have shown the crucial role of friendship, social skills, and low levels of stress in adolescents' happiness (Chaplin, 2009; Demir et al., 2012; Natvig et al., 2003). It is remarkable that low stress appeared as a predictor of happiness, considering the high levels of stress that adolescents with AS are exposed to, such as frequent situations of bullying, teasing, or isolation (Storch et al., 2012; Thompson and Thompson, 2007). This evidence is consistent with our first finding, considering the social difficulties that this population copes with due to their impairments in theory of mind (ToM) and empathy (Baron-Cohen et al., 2001; Baron-Cohen and Wheelwright, 2004; Gillberg, 1992).

### **How Do Adolescents With AS Feel?**

The second question addressed in this paper was "How do adolescents with AS feel?" No differences between adolescents with AS and their non-AS peers were found for negative affect. However, the frequency of positive affect reported by the group with AS was lower compared to the positive affect reported by the group without AS. Due to this low positive affect, the affective balance of the group with AS (obtained subtracting

negative affect from positive affect; Sanjuan, 2011) was also poorer compared to the one of the group without AS.

Previous research has also failed to find differences on negative affect between a normative group and a group with learning disabilities comprising adolescents with ASD (Laurent, Joiner, & Catanzaro, 2011). It is important to note that, although depressive and anxious symptoms have been commonly reported among adolescents with AS (Ghaziuddin, et al., 1998; Kim et al., 2000; Rieske et al., 2012), none of the participants had a comorbid affective disorder when the study took place. Highly related to the experienced affect are the emotional regulatory strategies (Samson, Hubert, & Gross, 2012). In this regard, Silvers et al. (2012) found adolescents to use a wide variety of strategies to regulate emotions. One of these strategies was reappraisal, which was related to age during adolescence (this strategy more commonly used in late adolescence). Reappraisal is known as one of the most successful strategies to manage negative emotions and is dependent on cognitive abilities, such as ToM (Samson et al., 2012). On the field of autistic disorders, adults with AS have been reported to be highly successful in applying suppression as a frequent strategy to manage negative emotions instead of more advanced ones, such as distance or reappraisal, probably due to their deficits in ToM (Samson et al., 2012; Silvers et al., 2012). The use of suppression would prevent them from dwelling on negative states, although it should be noted that according to the literature on emotional regulation, this is not the most desirable strategy to cope with negative emotions (Geraerts, Merckelbach, Jelicic, & Smeets, 2006; Samson et al., 2012).

Regarding the finding of lower positive affect among adolescents with AS, we consider their social impairments as a likely cause. Social engagement and social relationships are an important source of positive emotions, such as joy and belonging

(Diener et al., 2009; Tkach and Lyubomirsky, 2006). As referred to previously, social impairments of people with AS are usually explained due to their deficits in ToM and empathy (Dziobek et al., 2008). However, it also should be noted, as Berthoz and Hill (2005) stated that "it is more likely that individuals with ASD show a different way of actually processing their emotions rather than an absence of this processing" (p. 297). Eventually, this "different way of processing" could lead them to experience positive events less intensely and, therefore, to experience positive emotions less frequently. In the long term, these differences between positive and negative affect are responsible of the lower affective balance found in adolescents with AS compared to their matched peers.

### **Is The Relationship Between Having Or Not Having AS and Happiness/Affect Mediated by Empathic Abilities?**

The key point in this study is the mediating role found for empathic abilities between having or not having AS and the levels of happiness and affect experienced. Regarding the importance that social relationships have demonstrated over happiness and affect (Diener and Seligman, 2002; Tkach and Lyubomirsky, 2006), and the crucial role of empathy in the quality of these relationships (Smith, 2009a), we addressed the question "Is the relationship between having or not having AS and happiness/affect mediated by empathic abilities?" We considered empathy as comprising two components: cognitive empathy (called perspective-taking) and affective empathy (called empathic concern).

**Does perspective-taking mediate the relationship between AS and happiness and affect?** Perspective-taking partially mediated the relation between having or not having AS and happiness. For positive affect and affective balance, it totally mediated this relation. These results are a novel finding, since they are the first of their kind in the

field of AS. To our knowledge, few studies have related empathy to well-being or happiness in a neurotypical population (Hills and Argyle, 2001; Shanafelt et al., 2005). In our study, we found that both components of empathy, cognitive and affective, partially mediated the relationship between the syndrome itself and the happiness reported, although the indirect effect of PT was stronger. These results are in line with the study by Shanafelt et al. (2005) who found a relationship between PT and happiness, but not between happiness and EC. A possible explanation to these results is that the ability to take another's perspective is crucial to social success; first, because once you can understand a social situation you can react in the appropriate way (which has been shown to happen within the AS population; Rogers et al., 2008), and join people successfully. Second, the ability to take another's perspective leads to success in important pieces of the social puzzle, such as the understanding of double sense expressions, jokes or humor (Uekermann, Channon, Winkel, Schlebusch, & Daum, 2006).

Our results also suggested that those who have better cognitive empathy are also those who feel more positively and have higher affective balance, because perspective taking totally mediated the relationship between having or not AS and positive affect and affective balance. According to Samson et al. (2012), it is likely that the better the ability an individual has to take another's perspective, that individual is more likely to use reappraisal as regulatory strategy in coping with negative emotions and less likely to ruminate and dwell, which has been related to negative affect and unhappiness (Lyubomirsky, Boehm, Kasri, & Zehm, 2011; Samson et al., 2012).

Moreover, research on social comparison processes can also shed some light on our findings. The importance that peers have during adolescence gives to social comparison processes a relevant role not only to the development of autonomy and

identity (Graça et al., 2013; Nilsen et al., 2013) but also to the feelings of belonging, social pertinence, and even the affect experienced (Tureck and Matson, 2012; Whitehouse et al., 2009). Hedley and Young (2006) showed how the more different the adolescent with AS feels from his/her peers, the more depressive symptoms he/she has. Finding this mediating role of perspective-taking on positive affect and affective balance may show that a better understanding of another's mind allows certain competencies to come into play at the time of comparison with peers, and allows the adolescents with AS the opportunity to find alternative explanations to others' behavior. For example, if they talk to a peer in class and obtain the response "leave me alone", instead of interpreting it as a rejection it could be interpreted as due to the results of the exam the other has just received.

**Does empathic concern mediate the relationship between AS and happiness and affect?** The final consideration within the mediation of empathic abilities on happiness, positive affect, and affective balance regards empathic concern. EC mediated for all of the relationships proposed (having AS and happiness, affect, and affective balance respectively), but had a smaller indirect effect than perspective-taking. Literature on altruism has related empathy to altruistic behaviors (Batson, Duncan, Ackerman, Buckley, & Birch, 1981), and has also stated how positive emotions influence people to be more prosocial and kind. It also seems that helping others leads to psychological benefits such as positive emotions, feelings of self-confidence, and fulfillment (Schwartz, Bell, Ma, & Reed, 2003). Therefore, besides understanding others, feeling concern for them would enhance positive emotions and feelings of happiness through the mechanisms of helping and belonging. This has been pointed out by studies within the school context, which have shown how those kids who commit

more acts of kindness and helping behaviors are better rated by their peers (Layous, Nelson, Oberle, Schonert-Reichl, & Lyubomirsky, 2012; Oberle et al., 2010).

In sum, our results show that all of these variables (empathy, happiness, and affect) are closely linked. We tentatively assume that the importance of empathic abilities takes place through the quality of social relationships and understanding of the social world. On the one hand, a better understanding of social cues and others' minds eventually would allow adolescents with AS to feel happier. On the other hand, showing concern for others provides opportunities to connect them and get positive rewards, and may not only improve the social status of the student among his/hers peers but may also protect against bullying and isolation (Layous et al., 2012; Oberle et al., 2010; Thompson and Thompson, 2007).

### **Implications**

This study provides preliminary data on the levels of happiness and affect experienced by adolescents with AS, and highlights the role of empathic abilities (both cognitive and affective) on other psychological variables, such as affect experienced and subjective happiness. Because we were looking at a clinical population, this study has both the theoretical and practical implications. Theoretically, the findings from the present study open a new theoretical lens with which to perceive adolescents with AS. Indeed, understanding the mechanisms underlying happiness and other well-being variables is as important as understanding the deficits present in AS, a disorder that is not a punctual disease, but a lifetime condition.

On the practical level, work with adolescents with AS is usually focused on several points, for instance, overcoming their social difficulties or their difficulties at school such as bullying (when present), preventing them from suffering depression or anxiety, and helping them to assume and incorporate their personal characteristics to

their own self-concept (Holliday, 2004). Now, with the appropriate intervention, we can think over the possibility to increase their levels of happiness and positive affect, given the knowledge on their poor levels of both. For example, now we know that the intervention should be focused on promoting positive feelings rather than managing negative emotions if they do not have any affective disorder. We can give an additional value to the common intervention on perspective taking and empathic concern by looking to their relationship with happiness and affect. It is all about working to enhance wellness and positive functioning, and not just to resolve the current problem.

### **Limitations and Future Directions**

A limitation for this study is that some variables of interest were not measured, such as stress, self-esteem, or social skills. This study also lacks of a measure of pure affective empathy. Although at first sight the self-report nature of the measures used could be considered a limitation, some scholars have already shown that people with AS are capable of responding accurately to self-report measures of emotions (Berthoz and Hill, 2005; Hill, Berthoz, & Frith, 2004). In the future, it would be interesting to design longitudinal studies from childhood to adulthood, in order to see possible effects of the developmental stage on these variables, as well as to include performance measures of empathy and multiple observers, such as reports from parents or teachers about their social performance, their affective states, and the happiness manifested every day by adolescents with AS. Despite the ratio for this disorder between boys and girls is highly unequal (4:1 according to Ehlers and Gillberg, 1993), it would be enriching for its understanding (and also for the potential intervention) to be able to compare the role of perspective-taking and empathic concern on happiness and affection between boys and girls, since the expected roles and the social functioning of boys and girls in this age are

strongly different. We encourage future research to replicate and expand on these findings accounting for the named limitations.

The main contribution of this work, beyond its results and implications, is to open a new window through which to look for adolescents with AS. Researchers, clinicians, and significant adults need to look beyond a deficit and pathology focus and begin to focus on the promotion of feelings of competence, happiness, and well-being in children and youth with AS. Future work needs to examine not only the problems that individuals with AS confront, but to also begin to uncover their potential and strive to find the necessary tools to promote their happiness and well-being while also respecting their differences.

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