An Assessment of Perceived Antecedents to Attitudes of College Students towards Children with Autism

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Abstract

This study examined the extent to which six antecedent variables influenced college students' attitudes towards autism. A comprehensive literature review and factor analysis identified the six perceived antecedents, including *learning and volunteer experience, family/friends with autism, parental role, exposure to children with autism, mass media influence*, and *inclusion belief toward autism*. A total 195 college students participated in the study. Results of multiple regression analyses indicated that the regression model was significant ($p < .001$), and the six antecedent variables explained 18% of the variance. *Inclusion belief* was found to be a significant predictor of attitudes ($\beta = .32$, $p < .01$). In addition, *gender*, *student major*, *personal learning* and *volunteer experience* were found to influence personal attitudes.

An Assessment of Perceived Antecedents to Attitudes of College Students towards Children with Autism in the U.S.

Recent estimates suggest that one in every 68 children in the United States have an autism spectrum disorder and the trend suggests that the prevalence rate is on the rise (Centers for Disease Control and Prevention, 2014). This trend has significant implications for both the individuals with autism as well as society. Many people with the disability will require access to fundamental services such as education, healthcare, rehabilitation, and vocational training and society has to adapt in order to facilitate successful participation of the individuals. Unfortunately, barriers have been identified that stymie the successful access of services by individuals with disabilities in general (Miller 2010).

Miller (2010) reported that negative societal and professional attitudes still serve as a barrier for the successful functioning of individuals with disabilities. As a result, "improving the [outcomes] of individuals with disabilities requires assessing existing and future [professionals' and service providers'] attitudes about persons with disabilities" (Miller, 2010, p. 3). Previous research has examined the attitudes of professionals towards individuals with disabilities. Specifically,

researchers have examined the attitudes of school-teachers towards children with autism (e.g., Al-Shamari, 2006; Olley, DeVellis, DeVellis, Wall, & Long, 1981; Park & Chitiyo, 2009; Park, Chitiyo & Choi, 2010); others have examined the attitudes of health care providers towards individuals with disabilities in general (e.g., Miller, 2010). Still others have examined the attitudes of non-professionals towards children with disabilities (e.g., Reiter & Vitani, 2007; Swaim & Morgan, 2001; Chambres, Auxiette, Vansingle & Gill, 2008). It is encouraging that most of these studies indicate positive attitudes towards individuals with disabilities.

However, in spite of these positive reports, recent studies suggest that people with disabilities "are still reporting attitudinal barriers from society in general and from [certain] professionals in particular" (Miller 2010, p. 3). These attitudinal barriers may result in negative outcomes for individuals with disabilities in terms of education, employment, and participation in society in general (Siperstein, Norins, Corbin, & Shriver, 2003; Unger, 2002). Parusalam (2006), for example, identified attitude as one of the most important variables influencing educational outcomes among children with disabilities.

Given the importance of professionals' attitudes towards individuals with disabilities, it is necessary to examine factors that shape these attitudes. Park and Chitiyo (2009) proposed a conceptual framework for examining the factors that influence attitude. The framework includes examination of both antecedents and consequences of professionals' attitudes. The antecedents can be grouped into personal factors (e.g., gender and age of professional), social factors (e.g., the mass media, parental influence, and peer groups), exposure to children with autism (e.g., the type of contact one has with someone with autism), and other environmental factors (e.g., one's level of education and professional development programs). According to Park and Chitiyo, this model could help us understand how professional attitudes are formed and maintained, which could assist us in our efforts to shape those attitudes.

To date, few studies have examined antecedents to attitudes towards autism. Morton and Campbell (2007) examined how information source affects peers' initial cognitive and behavioral attitudes toward an unfamiliar child with autism. Results of that study indicated that attitudes toward autism varied depending on who provided explanatory information on autism. Campbell, Ferguson, Herzinger, Jackson and Marino (2005) found that sociometric status affected the social behaviors of typically developing peers towards children with autism. Similarly, Morton and Campbell (2008) examined how the media type affected attitudes towards autism and found no differences between live video or videotape channels of presentation of information. Other studies have examined the impact of factors such as contact (Slininger, Sherrill, & Jankowski, 2000) and demographics (Gray & Rodrigue, 2001) on attitudes towards individuals with disabilities in general. No doubt, these studies have helped us to better understand how we can promote positive attitudes towards disabilities and autism in particular. Nevertheless, there appears to be several issues still to be addressed as far as antecedents to attitudes towards autism are concerned (Campbell, 2006).

Campbell (2006) noted that little research has examined factors that influence attitude change, in adults, towards individuals with disabilities. Campbell also highlighted the need for research on variables that may serve as antecedents on attitudes towards autism. The purpose of this study was to extend research on antecedents to professionals' attitudes towards autism. Specifically,

these researchers wanted to find out the extent to which different antecedent factors influence professionals' attitudes toward autism. In doing this, the researchers targeted college students because previous research suggested that the successful participation of college students with disabilities requires positive attitudes of their peers without disabilities and the entire college community (Johnson, 2006). Also, college students are future professionals who may become education, business and government leaders capable of influencing policy and, therefore, the successful participation of individuals with disabilities in both school settings as well as the workforce. In order to positively influence their attitudes, it is necessary first to understand the variables that influence their attitudes.

Method

Sample and Procedure

Data were collected from a convenience sample of 195 college students at a university in the Midwestern United States. Permission to conduct the survey was secured by the university's Human Subject Review Board. Data collection was completed at classrooms in the University's College of Education. In order to conduct the survey, the researchers first sought permission from faculty members in the departments. In addition, the researchers also contacted instructors and faculty members in departments who taught the university core curriculum courses, physical education teacher education, and sport administration. After receiving approval to conduct the surveys from the instructors, the researchers explained the purpose of the study to the study participants before administering the survey. Participation in the study was voluntary. Students who chose to participate completed a paper-and-pencil survey.

Measures

Perceived Antecedents Instrument. Based on a comprehensive review of the literature on attitude and attitude toward autism, the authors identified eight perceived antecedent factors including, exposure to children with autism (Royal & Roberts, 1987), teaching experience (Park et al., 2009), education and learning experience (Eagly & Chaiken, 1993), volunteer experience, parental role (Dalhouse & Frideres, 1996), inclusion belief towards autism (Blackwell, Miniard, & Engel, 2001), mass media influence (Fortunato, Sigafoos, & Morsillo-Searls, 2007; Nelson, 2000), and influence of family and friends with autism (Rosenbaum et al., 1988). Based on the eight antecedent subscales, the authors developed a survey instrument that included a total of 24 items measuring an individual's perceived antecedents to attitude toward autism (see dimensions and items in Table 1). A professor in special education confirmed the content validity of the

Table 1

Perceived Antecedents: List of the Items Used

Dimensions & Items	
Exposure to Children with Autism	
ECA. 1	Spending time with children with autism promotes positive attitudes towards CWA [a]
ECA. 2	Going to school with someone with disabilities contributes to positive attitudes towards CWA
ECA. 3	Being in the same class with someone with autism contributes to positive attitudes towards CWA
Teaching Experience	
TE. 1	Teaching special education students contributes to positive attitudes towards CWA
TE. 2	Teaching students with autism contributes to positive attitudes CWA
Education and Learning Experience	
ELE. 1	Conducting autism seminars contributes to positive attitudes CWA
ELE. 2	Participation in autism workshops contributes to positive attitudes CWA
ELE. 3	Participation in education programs about autism contributes to positive attitudes CWA
ELE. 4	Learning about autism in college contributes to positive attitudes CWA
Volunteer Experience	
VE. 1	Doing volunteer work for children with autism contributes to positive attitudes towards CWA
VE. 2	Working for programs that provide services for children with autism contributes to positive attitudes toward CWA
VE. 3	Doing volunteer work for autism awareness programs contributes to positive attitudes towards CWA
Inclusion Belief	
IBA. 1	Inclusion contributes to positive attitudes towards CWA
IBA. 2	It is important to provide equal educational opportunity to individuals with disabilities
IBA. 3	Individuals with autism can make significant contribution to society
Mass Media Influence	
MMI. 1	Watching a lot of stories about autism ion TV contributes to positive attitudes towards CWA
MMI. 2	Reading a lot of stories about autism in newspapers/magazines contributes to positive attitudes towards CWA
MMI. 3	Reading a lot about autism on the internet contributes to positive attitudes towards CWA
Parental Role	
PR. 1	Children whose parents teach them to respect individuals with autism develop positive attitudes towards CWA
PR. 2	Children whose parents teach them to respect individuals with disabilities develop positive attitudes towards CWA
PR. 3	Children with parents who support programs for in for individuals with disabilities have positive attitudes towards CWA

Family and Friends with Autism	
RFF. 1	Having a family member with autism leads one to appreciate individuals with autism
RFF. 2	Having a relative with autism leads one to appreciate individuals with autism
RFF. 3	Having a friend with autism leads one to appreciate individuals with autism

Note. [a] Children with autism

instrument. All of the antecedent items were measured on a five-point Likert type scale (1 indicated 'strongly disagree' while 5 indicated 'strongly agree').

Internal consistency estimates (Cronback's Alpha) for each perceived antecedent subscale were computed to confirm the reliability of the subscales used in this study. All subscales showed satisfactory internal consistency estimates (.80-.94) except for the *inclusion belief* (*a* = .69) subscale; this is acceptable. The reliability estimates for all the subscales were as follows: *exposure to children with autism* (*a* =.80*), teaching experience* (*a* =.85), *education and learning experience* (*a* =.92), *volunteer experience* (*a* =.91), *inclusion belief toward autism* (*a* =.69 – item 13 deleted), *mass media influence* (*a* =.88), *parental role* (*a* =.90), and *influence of family and friends with autism* (*a* =.94). The reliabilities of the measures were therefore, quite satisfactory (Nunnally, 1978). One item related to *inclusion belief* was deleted because the item had a low reliability estimate. Thus, the revised instrument consisted of 23 items.

This current study used the ChedoKe-McMaster Attitudes Towards Children with Handicaps (CATCH) scale in order to measure attitude (Rosenbaum et al., 1988). The CATCH scale includes three components: affective, cognitive, and behavioral components. The scale contains 36 items with 12 items in each component; however, Rosenbaum and colleagues deleted nine items out of the 36 items based on factor analysis. Rosenbaum and colleagues confirmed that the CATCH scale was psychometrically sound, and demonstrated good reliability and validity. In this current study, the *27*–item CATCH scale was used to assess students' attitudes toward children with autism. Among the 27 items, 10 items were related to the affective component, eight items were associated with the cognitive component, and nine items were related to the behavioral component. The scale demonstrated good reliability (*α* = .85). Several items were modified, in terms of language, to suit the context.

Data Analysis

Data were analyzed using the Statistical Package for Social Science (SPSS, version 16.0). First, an exploratory factor analysis was used to uncover the underlying structure of the eight perceived antecedent subscales. Second, descriptive and correlational analysis were conducted to report the mean scores of each antecedent variable and to examine the relationships among the independent variables (antecedents) and dependent variable (attitude). Third, a series of multiple regression analyses were carried out to investigate the effect of the perceived antecedent factors on attitude and behavioral intent. A series of analyses of variance were conducted to examine attitude differences with respect to the study participants' demographics (e.g., gender and major) and their different types of exposure to autism (e.g., teaching, volunteer, and learning experiences).

Results

Demographic Information

The average age of participants was 23.5 years. Approximately, 53 % (*n* = 104) were male, and 47% (*n* = 91) were female. Regarding race, 75% (*n* = 146) were White/Caucasian and 17% (*n* = 34) were African Americans. The other ethnic groups included Hispanics (*n* = 3, 1.6%), Asians (*n* = 2, 1%), Native Americans (*n* =1, .5%), and others (*n* = 5, 2.6%).

In terms of students' career goals, 35 % (*n* = 69) indicated that they wanted to be either special education or general education teachers and 64% (*n* = 117) reported that they wanted to pursue other career fields.

Concerning different types of exposure to people with autism, 49 % (*n* = 94) reported that they had been in the same classroom with someone who had autism, 20% (*n* = 51) indicated that they participated in workshops about autism. Thirty-four percent (*n* = 57) reported that they attended educational programs about autism and approximately 15% (*n* = 29) indicated that they had a family member who had autism. This information on different types of exposure is presented in Table 2.

Table 2
Frequency and Percentage of Different Types of Exposure

Type of Exposure	Frequency	Percentage
Being in the same classroom with someone with autism	94	48.7
Teaching special education classes	46	23.6
Teaching children with autism	51	26.3
Participation in workshops about autism	38	19.6
Participation in education program about autism	67	34.4
Learning opportunity about autism in college	120	61.5
Volunteer work with children with autism	75	38.7
Working experiences (e.g., autism center)	68	34.9
Having family member who has autism	29	14.9
Having a relative who has autism	71	36.4

Note. N = 195

Perceived Antecedents: Factor Analysis

The factor structure underlying the scales was examined using principal factoring with a varimax rotation (see Table 3). The eight factors were merged into five factors. Factor analytical analyses suggested a five-factor solution that explained 71.30 % of the variance in the data. Four out of the 23 items (TE.1, TE.2, ECA.1, and PR.1) were deleted, because either their communalities were less than .40 or those items had relatively small loadings on each of the factors. The value of the Kaiser-Meyer-Olkin statistic was .919, which indicates that factor analysis is appropriate for the data and can produce distinct and reliable factors (Hutcheson & Sofroniou, 1999). The five factors were (1) *learning and volunteer experience & inclusion belief* (α = .94), (2)

family/friends with autism (α = .94), (3) *parental role* (α = .86), (4) *exposure to children with autism* (α = .80), and (5) *mass media influence* (α = .88).

Table 3

Results of Factor Analysis: Perceived Antecedents to Attitudes Toward Children with Autism

	FI Learning and Volunteer Experience & Inclusion [a]	*F2 Family/Friends with Autism*	*F3 Parental Role*	*F4 Exposure to Children with Autism*	*F5 Mass Media Influence*
ELE. 1	.811				
ELE. 2	.845				
ELE. 3	.833				
ELE. 4	.646				
VE. 1	.643				
VE. 2	.649				
VE. 3	.603				
IBA. 2	.581				
IBA. 3	.440				
RFF. 1		.837			
RFF. 2		.857			
RFF. 3		.856			
PR. 2			.820		
PR. 3			.692		
ECA. 2				.803	
ECA. 3				.797	
MMI. 1					.889
MMI. 2					.870
MMI. 3					.767
% of Variance	51.12	7.93	5.58	4.46	4.21
Cronbach's α	.94	.94	.86	.80	.88

Note 1. [a] Learning and volunteer experience & inclusion belief

The exploratory factor analysis indicated that the previous three antecedent factors, which include *education* and *learning experience*, *volunteer experience*, and *inclusion belief* were merged together. However, because the *inclusion belief* subscale is theoretically different from the other two factors, it was considered to be a separate subscale. Therefore, the previous eight factors produced six factors, and the final version of the instrument assessing antecedents to attitude toward autism contained a total of 19 items and demonstrated a very high reliability (α = .94). In addition, internal consistency estimates (Cronbach's Alpha) for each subscale were computed to confirm the reliability of the subscales. The reliabilities estimates for all factors were above the cutoff of .70, except for *inclusion belief* (.69) that can be considered to be acceptable. Therefore, the reliabilities of the measures were quite satisfactory (Nunnally, 1978).

Descriptive Statistics and Correlational Analysis

As indicated in Table 4, the participants of this study perceived *family/friends with autism* as the most important factor affecting attitudes ($M = 4.65$, $SD = 0.67$). *Inclusion belief* was found to be the second most important antecedent factor ($M = 4.55$, $SD = 0.66$), followed by *parental role* ($M = 4.52$, $SD = 0.66$), *learning and volunteer experience* ($M = 4.34$, $SD = 0.70$), *exposure to children with autism* ($M = 4.09$, $SD = 0.75$), and *mass media influence* ($M = 3.76$, $SD = 0.82$). Concerning attitude toward children with autism, the mean score was 3.81 ($SD = 0.38$). This result indicated that the study participants had favorable attitudes toward children with autism. The correlations among the six perceived antecedent variables and attitude are presented in Table 5. All of the variables were positively correlated to each other. In particular, *learning and volunteer experience* and *perception* were strongly related to all of the antecedent factors and to attitude ($p < .01$). More importantly, attitude was significantly correlated to all of the antecedent variables.

Regression Analyses: Influence of Perceived Antecedents on Attitude

Two multiple regression analyses were performed to examine the influence of perceived antecedent variables on attitudes (See Table 6). In the first regression model, attitude was simultaneously regressed on the six perceived antecedent variables, including *learning & volunteer experience, family/friends with autism, parental role, exposure to children with autism,*

Table 4

Descriptive Statistics: Importance Ranking in Perceived Antecedents

	Perceived Antecedents	*Mean*	*SD*
1	Family/friends with Autism	4.65	.67
2	Inclusion Belief	4.54	.66
3	Parental Role	4.52	.66
4	Learning & Volunteer Experience	4.35	.70
5	Exposure to Children with Autism	4.09	.75
6	Mass Media Influence	3.76	.82

Note. N = 195

Table 5

Correlations among Study Variables

	Variables	1	2	3	4	5	6	7
1.	Family/Friends with Autism	1.000	.535**	.587**	.624**	.426**	.293**	.257**
2.	Inclusion Belief		1.000	.555**	.665**	.470**	.309**	.412**

3.	Parental Role	1.000	.650**	.484**	.454**	.283**
4.	Lean. & Vol. Exp. [a]		1.000	.589**	.485**	.353**
5.	Exposure. CWA [b]			1.000	.398**	.223**
6.	Media Influence				1.000	.161*
7.	Attitude					1.000

Note 1. *$p < .05$, **$p < .01$
Note 2: [a] Learning and volunteer experience; [b] Exposure to children with autism

mass media influence, and *inclusion belief*. The results indicated that the regression model was significant, $F(6,184) = 6.66$, $p < .001$, and the six antecedent variables explained 18% of the variance. *Inclusion belief* was found to significantly predict attitude ($\beta = .32$, $p < .01$).

In the second regression model, attitude was hierarchically regressed on the two demographic variables (gender and age) (Step 1) and the six antecedent factors (Step 2) in order to explore the unique contribution of the antecedent factors. The eight factors jointly explained 24% of the variance in attitude. The results of step 1 indicated that the two independent variables (gender and age) accounted for 10% of the variance ($F(2,184) = 10.48$, $p < .001$). Gender was found to be a significant predictor of attitude ($\beta = .31$, $p < .001$). In step 2, the six antecedent factors were entered into the regression equation. The results revealed that the six variables explained a significant amount of variance in attitude ($\Delta R^2 = .14$, $F(8,184) = 5.24$, $p < .001$). *Inclusion belief* was the only statistically significant predictor ($\beta = .24$, $p < .05$). The results of the two regression analyses are presented in Table 6.

Analysis of Variance: Demographic Differences in Attitude
Analysis of variance (ANOVA) showed gender differences in college students' attitudes toward children with autism ($F(1, 187) = 19.97$, $p < .001$). Female students ($M = 3.93$, $SD = 0.36$) had more positive attitudes than their male counterparts ($M = 3.70$, $SD = 0.38$). Regarding ethnicity, ANOVA did not reveal any significant differences in attitude across different ethnic groups (F (5, 183) = 1.31, $p = .263$). However, African Americans and Caucasians were the two largest groups in the sample, and ANOVA revealed the difference in attitude between the two groups. Caucasians ($M = 3.84$, $SD = 0.39$) had more positive attitudes than African Americans ($M = 3.67$, $SD = 0.38$), (F = (1, 172) = 5.832, p = .017). Concerning student majors, ANOVA yielded significant differences in students' attitudes between students with the special education

Table 6
Results of Regression Analyses

Model 1				Model 2			
	β	ΔR^2	ΔF		β	ΔR^2	ΔF
Step 1		.18	6.66***	Step 1		.10	10.48***
Learn.& Vol. [a]	.15			Gender	.31***		
Fam/Fr autism	-.03			Age	.04		
Parental Role	.05						
Exposure [c]	-.01			Step 2		.14	5.24***
Media Influ.	-.04			Learn.& Vol. [a]	.09		

Inclusion Belief	.32**	Fam/Fr autism	.003
		Parental Role	.10
		Exposure [c]	.06
		Media Influ.	-.03
		Inclusion Belief	.24*
Overall R^2	.18		.24
Adj. R^2	.16		.21

Note 1. $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$
Note 2. [a] Learning and volunteer experience; [b] Family/friends with autism; [c] Exposure to children with autism

major and those with a non-special education major ($F(1, 184) = 17.65$, $p < .001$). Students majoring in special education ($M = 4.00$, $SD = 0.37$) had more favorable attitudes than non-special education major students ($M = 3.73$, $SD = 0.36$).

Analysis of Variance: Attitude Differences in Personal Experiences Related to Autism
Personal experiences related to people with autism were found to influence attitudes toward children with autism (see Table 7). Being in same classroom with persons with autism was found to affect college students' attitude toward children with autism ($F(1, 185) = 5.022$, $p = .026$). Students who were in same classroom with individuals with autism ($M = 3.87$, $SD = 0.37$) had more positive attitudes than those who were not ($M = 3.75$, $SD = 0.38$). Teaching experience appeared to affect college students' attitudes. Students who had taught special

Table 7
Mean Attitudes as a Function of Types of Exposure

Type of Exposure	Status	N	M	SD
Being in the same classroom with someone with autism	Yes	92	3.87	.37
	No	94	3.75	.38
Teaching special education classes	Yes	44	3.91	.39
	No	144	3.78	.37
Teaching children with autism	Yes	49	3.95	.39
	No	138	3.76	.37
Participation in education programs about autism	Yes	63	3.91	.35
	No	125	3.76	.39
Learning opportunity about autism in college	Yes	115	3.90	.37
	No	73	3.65	.34
Volunteer work with children with autism	Yes	70	3.90	.37

No	116	3.75	.38

Note. All non-significant findings from ANOVA analyses were not reported ($p > .05$)

education classes ($M = 3.91$, $SD = 0.39$) reported higher scores on attitudes than those who had not ($M = 3.78$, $SD = 0.37$), ($F(1, 187) = 4.166$, $p = .043$). In addition, students who had previously taught children with autism ($M = 3.95$, $SD = 0.39$) had more favorable attitudes than those who had never done so ($M = 3.76$, $SD = 0.37$), ($F(1, 186) = 9.635$, $p = .002$).

Students' learning and volunteer experiences were found to influence attitudes. Students who participated in education programs about autism ($M = 3.91$, $SD = 0.35$) had more favorable attitudes than those who did not ($M = 3.76$, $SD = 0.39$), ($F(1, 187) = 7.027$, $p = .009$). Students who had the opportunity to learn about autism ($M = 3.90$, $SD = 0.37$) had more positive attitudes than those who did not ($M = 3.65$, $SD = 0.34$), ($F(1, 187) = 21.443$, $p = .000$). Students with volunteer experience working with children with autism ($M = 3.90$, $SD = 0.37$) reported higher scores on attitudes than those who did not have such volunteer experience ($M = 3.75$, $SD = 0.38$), ($F(2, 186) = 3.642$, $p = .028$). However, there was no significant difference in attitude between students who participated in workshops about autism ($M = 3.83$, $SD = 0.38$) and those who did not ($M = 3.80$, $SD = 0.38$), ($F(1, 186) = 0.127$, $p = .722$). In addition, there was no significant difference in attitude between students who had worked for autism programs ($M = 3.84$, $SD = 0.38$), and those who had not ($M = 3.79$, $SD = 0.38$), $F(2, 187) = 0.589$, $p = .556$).

Discussion

This study was designed to examine perceived antecedents to attitudes toward autism. The six perceived antecedents were identified based on the literature review and factor analysis, which include *learning and volunteer experience, family/friends with autism, parental role, exposure to children with autism, mass media influence*, and *inclusion belief* toward autism. Concerning the ranking importance of these antecedent factors, descriptive statistics indicated that having significant others with autism was found to be the most important factor affecting people's attitudes toward autism, while the second important factor was *inclusion belief*, followed by *parental role, learning and volunteering experience*, and *exposure to children with autism*. More importantly, the six perceived antecedent factors significantly contributed to the prediction of attitudes toward autism. *Inclusion belief* toward autism was found to be a significant predictor. In addition, gender was found to have a significant effect on attitude toward autism. Regarding demographic differences in attitude, gender, student major, personal learning and volunteer experience were found to influence personal attitudes.

Importance Ranking among Perceived Antecedents

As indicated in Table 3, five out of the six perceived antecedents were found to be important factors affecting person's attitude; all of the average mean scores of the five antecedents were above 4.0 out of 5.0 scale. *Having family/friends with autism* was found to be the most important perceived factor related to attitude toward autism. This finding is consistent with previous research (e.g., Martin, 1974; Nevill & White, 2011; Rosenbaum, Armstrong, & King, 1988; Royal & Roberts, 1987). Based on a sample of 652 college students, Nevill and White (2011) found that students who had a first-degree relative with ASD had more favorable attitudes toward people with ASD than the college students who did not have a person with ASD as a

relative. Rosenbaum et al. (1988) also indicated that people who have friends who have disabilities tend to have more positive attitudes towards disabilities. The significant influence of having family and friends with autism on an individual's attitude can be attributed to the consequence of personal involvement. Thomsen, Borgida, and Lavine (1995) indicated "individuals are said to be personally involved with an issue, event, object, or person to the extent that they care about that entity and perceive it as important" (p. 191). Thomsen and colleagues also pointed out that several empirical studies demonstrated the significant effect of personal involvement on attitude (e.g., Petty & Cacioppo, 1986).

The second important factor was *inclusion belief* toward autism (the sample items: "It is important to provide equal educational opportunity to individuals with disabilities" and "individuals with autism can make significant contribution to society"). Blackwell et al. indicated that belief is one of the factors that influence an individual's attitude toward an object. In addition, Fishbein and Ajzen (1975) pointed out that personal belief can be an important determinant of a person's attitude. The importance of inclusion belief toward people with disabilities among college students was supported by a recent study by Park, Yoh, Choi, and Hums (2009), who conducted a qualitative study on college students' attitudes toward the Paralympic Games, which are the Olympics games for athletes with physical disabilities. The main finding of the study was that more than 90% of the study participants reported that it was important for companies to address people with disabilities, and they recognized the importance of providing equal opportunities for this population.

Parental role was found to be the third important perceived antecedent to attitude. As Dalhouse and Frideres (1996) pointed out, parents can have a significant influence on their children's attitudes toward an object or issue. Bohner and Wänke (2002) indicated that children may acquire their parent's attitudes and prejudices by imitating them. Thus, parents can have a crucial role in developing positive attitude of their children toward children with autism.

Learning and volunteering experience and *exposure to children with autism* appeared to be the fourth and fifth important perceived antecedents, respectively. This result seems to be consistent with findings from previous studies (e.g., Preston & Feinstein, 2004; Erwin, 2001; Fichten, Schipper, & Culter, 2005; McKenna et al., 2001) that have indicated that education and volunteering experience help to create positive attitudes towards people with disabilities. In Erwin's (2001) study, direct experience was found to be one of the predominant factors that affect the formation of attitude. McKenna et al. (2001), in a study on attitude of students enrolled in an Occupational Therapy course, also argued that students can have more positive attitudes towards disability after they entered into their fieldwork and interacted with individuals with disabilities firsthand versus the classroom environment. Direct experiences through learning and volunteering can create an opportunity for individuals to decrease the social distance that they have with individuals with autism and this experience ultimately increases positive attitudes towards autism.

Influence of Perceived Antecedents on Attitudes toward Children with Autism

Inclusion belief was found to be a significant predictor of attitudes toward children with autism. This result is in line with the previous literature on attitude formation. Blackwell et al. (2001) pointed out that personal belief plays a vital role in attitude formation. An individual's belief on

a specific object or issue can be established by his/her knowledge, and people obtain their knowledge from a variety of sources, including family, friends, co-workers, or media (Blackwell et al., 2001). Thus, based on the results of this study, we assumed that *inclusion belief* could be affected by the other five perceived antecedents; *family/friends with autism, parental role, learning and volunteer experience, exposure to children with autism*, and *mass media*. Indeed, as indicated in Table 6, the correlation analysis revealed that *inclusion belief* had a significantly positive relationship with all of the other antecedents ($p < .01$). Therefore, this finding may imply that there is a causal relationship among the antecedent factors, *inclusion belief*, and *attitude*. *Inclusion belief* might serve as a mediator between the five antecedents and attitude, suggesting that the five perceived antecedents can influence inclusion belief that is supposed to affect attitude (the five perceived antecedents → inclusion belief → attitude).

Demographic Differences in Attitudes toward Children with Autism

Results of this current study indicated gender differences in attitudes indicating female students had more favorable attitudes than their male counterparts. This result is in line with recent studies that examined teachers and pre-service teachers' attitudes toward autism (e.g., Chambres et al., 2008; Park et al., 2010; Park & Chitiyo, 2011). Although there have been inconsistent results regarding gender differences in attitudes towards people with disabilities, a large number of studies have reported higher levels of positive attitudes for females compared with males (e.g., Archie & Sherrill, 1989; Diamond & Hesteness, 1996; Rosenbaum et al., 1988). The higher level of females' attitudes can be explained by differences in empathic tendency between genders. Most studies on empathy have indicated that females score higher on empathy than males (Hoffman, 1977; Lennon & Eisenberg, 1987). In addition, Baron-Cohen (2003) pointed out that women are natural empathizers whereas men are better at systemizing.

Concerning student's major, the results indicated that students majoring in special education had more positive attitudes than non-special education majors. This result was consistent with the result of a recent study by Park et al. (2010) who examined pre-service teachers' attitudes toward children with autism. This result can be explained by the fact that college students majoring in special education, rather than those in other majors, tend to have more contacts with children with autism, and they are also likely to have more extensive learning experiences and training about autism. Thus, due to these reasons, students in special education might have more favorable attitudes (Rosenbaum et al., 1988; Royal & Roberts, 1987). These findings suggest that special education courses or structured learning experiences about autism could help to promote more positive attitude towards children with autism.

Like some previous studies (e.g., Hergenrather & Rhodes, 2007; Park et al., 2010; Rice, 2009) , the results of this study also indicate that being in the same classroom with individuals with autism, teaching experiences, and learning and volunteering experiences influenced college students' attitudes toward autism. Students who were in the same classroom with fellow students with autism, and those who had taught a special education class or children with autism had more favorable attitudes than those who had never done so; therefore, if education about autism and direct experience affect attitudes towards children with autism, then educational programs could be set up to promote more positive attitudes. With better education about autism, inclusion of children with autism in regular classroom, and facilitation of more volunteering and service

learning opportunity for students, we can promote more positive attitude about autism and other disabilities.

Theoretical and Practical Implications

The findings of this study have implications on how to address the need for more positive attitudes towards children with autism and other disabilities. This study can contribute to the existing body of the literature on attitude toward autism by exploring antecedents that influence personal attitude toward autism. While a number of studies have been conducted to examine the relationships between personal variables (e.g., demographic and personal educational background) and attitude toward autism, there has been lack of empirical studies that examined antecedents to attitudes toward autism (e.g., Campbell, 2006).

The findings revealed important points that further our understanding of how professional attitudes are formed and maintained, which could assist us in our efforts to promote positive attitudes toward autism. Identifying antecedents that have an effect on attitudes towards children with autism would help to identify strategies to promote positive attitudes among professionals. For example, it might be helpful to provide professionals with information about autism and other disabilities in order to promote better understanding of the disabilities and, therefore, promote more positive attitudes. Awareness of disabilities is particularly necessary for college students so that they can effectively support children with autism and their families. Positive attitudes about children with autism among college students may promote the provision of support and service for the children from those professionals.

Findings of this study also suggested the need to create more opportunities for college students and other professionals to have a direct experience with autism through service learning, volunteering, and networking. Providing information about autism, and opportunities for professionals to be directly or indirectly involved in the intervention of children with autism may promote positive attitudes among the professionals. Based on results of this study, we also suggest that it may be helpful for all general education pre-service teachers to be required to minor in special education. This is because according to current trends general education teachers will likely have a student on the autism spectrum in their classroom at some point in their careers and as more students on the spectrum are going to college and other post-secondary training, general education teachers can make the difference between the students' success or failure in transitioning to post-secondary education and life.

This study is not without limitations. This study is based on a convenience sample of college students attending only one college in a Mid-Western State in the US. This may limit the generalization of the findings. The nature of the curriculum in the college of education at the university may have influenced the outcomes. Readers therefore, need to be cautious in their interpretation of the findings. In spite of these limitations, this study sheds light on factors that may influence professional attitudes towards children with autism. Future research should investigate the extent to which each of the antecedent variables specifically influence professionals' attitudes towards autism.

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