



Teaching students with Autism Spectrum Disorder across various educational settings: The factors involved in burnout

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H I G H L I G H T S

- We compared the experience of teachers according to their educational setting.
- We investigated adjustment mechanisms in teachers of children with ASD.
- Teachers of children with ASD showed lower levels of burnout than regular teachers.
- Perceived stress, social support and self-efficacy predicted burnout levels.

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This study aimed to 1) compare the experience of 115 French-Canadian teachers of typical children and children with ASD according to their educational setting (i.e., mainstream classes, specialized settings), through dispositional (i.e., self-efficacy, empathy) and transactional variables (i.e., perceived stress, social support, coping strategies) and burnout; 2) assess the influence of these variables on burnout. The results indicate that teachers of typical children have higher levels of burnout than teachers of children with ASD. Perceived stress and social support predict burnout among teachers of children with ASD in mainstream classes while self-efficacy also predicts burnout among teachers in specialized settings.

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1. Introduction

Autism Spectrum Disorder (ASD) is a heterogeneous neuro-developmental disorder characterized by impaired social interaction and communication, as well as restricted or stereotyped

patterns of behavior or interests. It affects about 1–2% of children worldwide and epidemiological studies conducted over recent decades reveal a constant increase in its prevalence (Elsabbagh et al., 2012). Consequently, the ASD is considered today one of the most prevalent disabilities in school settings (Shattuck, 2006). Its associated core impairments greatly impact children's learning abilities as well as their overall autonomy (Rogers & Vismara, 2008). Therefore pupils with ASD often require the intervention of a wide range of services adapted to their specific needs. Despite some common features, each case of autism is unique, which impedes the adoption of general guidelines. However, past findings

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support the integration of children with ASD as early as possible in the same educational environment as typically developing children, in order to promote positive outcomes in terms of social and cognitive development (Ferraioli & Harris, 2010). Policy-makers have followed these recommendations to such an extent that, today several schooling options are available according to the needs of the child with ASD. They range from total inclusion in a mainstream class to schooling in a specialized institution.

1.1. *Teaching pupils with ASD*

The responsibilities that come with teaching children with ASD raise many educational challenges (Scheuermann, Webber, Boutot, & Goodwin, 2003). Even though teachers' work vary depending on the school setting, research has shown that both, mainstream and specialized educational teachers experience higher levels of psychological distress when children with ASD are included in their class (Gersten, Keating, Yovanoff, & Harniss, 2001).

In Québec (Canada), a continuum of educational services, from mainstream classes to special schools, is available to provide the best education possible for all children with ASD. These continua refer to models such as response to intervention, within the global movement towards inclusive education generalisation (Artiles, Kozleski, & Waitoller, 2011). Inclusive education is a classroom model where students with special needs integrate an ordinary class corresponding to their age within his neighbourhood school, regardless of their intellectual abilities or of their level of daily functioning. A governmental law in Québec stipulates that children with special needs have to benefit from services and adaptations, within the regular or adapted school curriculum, based on an evaluation of individualized needs and abilities (Ministère de l'Éducation, du Loisir et du Sport [MELS], 2007). Regardless of the type of education setting, schooling of students with ASD requires adaptations (e.g., adapted pedagogic material and curriculum), modifications of the environment (e.g., visual timetables or schedules), additional services (e.g., special needs assistance, speech and language therapy, occupational therapy and educational psychology) and interventions beyond the usual curriculum (Poirier & Cappe, 2016).

The ASD form severity is taken into account when deciding of the type of the school setting the students integrate. Regular schools include students with a medium form of the disorder, while students with a severe form of ASD, associated with a severe or profound intellectual disability, or multiple diagnoses usually attend special schools. However, regular teachers of inclusive classrooms are generally not trained to teach students with special needs such as ASD. They usually benefit from the support of a special needs assistant qualified on adapted interventions for children with special needs. Special education teachers received specific training on ASD as part of their university curriculum and work either in support classes within mainstream schools or in special schools. The special class and schools commonly observe an autism-specific approach based on TEACCH (Treatment and Education of Autistic and related Communication handicapped Children; Schopler & Olley, 1982), ABA (Applied Behavioral Analysis; Lovaas, 1987) or on sensorial stimulation programs (Poirier & Cappe, 2016). Moreover, the ratio pupil to student in these settings is smaller than in a regular classroom, with approximately 6–12 students for a special education teacher and a special needs assistant (Poirier & Cappe, 2016). Children with ASD in special schools are taken in charge by professional teams comprising psychologists, speech therapists, occupational therapists, nurses and social workers.

Findings suggest that teaching students with ASD is more challenging than teaching students with other disabilities, as this group of teachers shows higher levels of stress and burnout (Zarafshan, Mohammadi, Ahmadi, & Arsalani, 2013) and a lower sense of self-efficacy (Symes & Humphrey, 2011). Many teachers report feelings of powerlessness, confusion, frustration, disappointment, defeat and professional inadequacy (Baghdadli, 2011; Busby, Ingram, Bowron, Oliver, & Lyons, 2012). Certain environmental constraints, such as a lack of adapted teaching equipment, increased administrative responsibilities and feelings of limited support from educational authorities (i.e., school principals, government) may also explain the greater the prevalence of stress and burnout among these teachers (Antonioni, Polychroni, & Kotroni, 2009; Baghdadli, 2011). Moreover lack of social support and feelings of isolation are likely to contribute to increasing stress (Baghdadli, 2011). These social aspects are sources of concern as social support has been found to be valuable asset to cope with stressful situations (Curchod-Ruedi, Doudin, & Peter, 2009). In this respect a recent empirical study on factors linked with teacher self-efficacy put into light a common pattern in 14 OECD countries (Fackler & Malmberg, 2016), including teacher characteristics, teaching practices, classroom and student group characteristics.

1.1.1. *Teaching pupils with ASD in a mainstream class*

Children with ASD are generally first admitted into a mainstream school and then transferred to a better-adapted schooling environment if needed. Mainstream teachers of children with ASD often report inadequate preparation and a lack of specific training (Busby et al., 2012). However, teachers who have undergone in-service training on autism show a greater sense of self-efficacy, a critical factor in improving their overall experience (Benoit, 2013). Conversely, teachers who lack training have poorer relationships with pupils with ASD (Blatchford, Bassett, Brown, & Webster, 2009), leading to higher levels of occupational stress (Baghdadli, 2011). Findings have highlighted that low levels of self-efficacy and poor sense of control are chiefly linked to professional stress (Symes & Humphrey, 2011). School resources also appear to play a key role. For example, even though mainstream teachers of inclusive classes generally benefit of a special needs assistant support, and despite the school principals agreement on its crucial role for successfully schooling children with ASD (Ruel, Poirier, & Japel, 2015), teachers regularly report lacking resources and support (Busby et al., 2012; Ruel et al., 2015). In summary, the inclusion of a pupil with ASD in a mainstream class creates a stressful context that greatly affects the environment of teachers and contributes to the adoption of inadequate coping strategies (Brackenreed, 2011).

1.1.2. *Teaching pupils with ASD in specialized settings*

Teachers in specialized settings generally teach pupils with a moderate or severe form of ASD associated or not with severe intellectual disabilities or other comorbidities. Despite their academic background in special education, some researchers point out that many teachers are unprepared to work with children with ASD (Loiacono & Allen, 2008). This situation is potentially harmful for these teachers because low self-efficacy makes them more vulnerable to negative emotional reactions in stressful situations (Lee, Patterson, & Vega, 2011). Specialized classes and institutions for children with ASD commonly use an autism-specific approach based on various methods that enables teachers to feel more competent towards the special needs of children with ASD, and better prepares them to deal with behavioral problems (Jennett, Harris, & Mesibov, 2003). Moreover, teachers in specialized settings benefit of teams of various professionals support and of

smaller pupil to teacher ratio which is likely to lead to lower stress and well-being increase (Brunsting, Sreckovic, & Lane, 2014). Research suggests that teachers in specialized settings are more likely to use effective coping strategies as they mainly apply problem-solving and social support-seeking strategies to handle stressful situations (Antonioni et al., 2009). However, they tend to mainly use maladaptive coping strategies to specifically manage pupils' challenging behaviors, which contributes to higher levels of burnout (Hastings & Brown, 2002).

1.2. Objectives of the current study

The schooling of children with ASD is associated with significant stress features, which increase the risk of burnout in teachers. Although the literature on occupational stress and burnout in teachers covers a large spectrum of factors relative to the notions of appraisal and adaptation, the literature concerning French-Canadian teachers of pupils with ASD remains sparse. Therefore the present study represents a meaningful contribution to the current literature on the burnout of teachers due to its focus on teachers with experience in teaching children with ASD and its unique cultural context. We propose to use a multifactorial and integrative transactional model (Bruchon-Schweitzer & Boujut, 2014; Lazarus & Folkman, 1984) to better understand burnout in French-Canadian teachers of pupils with ASD. The present study aims to (1) compare the experience of these teachers according to the educational setting in which they work (i.e., regular class in mainstream school, specialized class in mainstream school and specialized institution), through dispositional (i.e., self-efficacy, empathy) and transactional variables (i.e., perceived stress, social support, coping strategies), as well as burnout; (2) assess the relations and weight of these dispositional and transactional variables on burnout dimensions.

2. Methods

2.1. Participants

Participants were 115 French-speaking Canadian teachers from preschool, elementary and high school or from specialized institutions situated in the province of Québec. In this sample, 93.9% were women and the mean age was 39.6 ± 9.2 years, which is fairly

comparable to the teacher population in Canada (Government of Canada, 2008). The average number of years in the teaching profession varied from 1 to 36 with an average of 14.2 ± 8.2 years. Three groups of teachers were involved in our study. Table 1 shows sociodemographic and occupational characteristics for the three groups of teachers included in this study.

The first group (G1) consisted of teachers who taught at least one pupil with ASD in a mainstream class during the past school year ($n = 26$). Ninety-six percent were women and the mean age was 39.6 ± 8.8 years (min = 27.4, max = 57.3). At the time of recruitment, their mean number of years in the teaching profession was 13.8 ± 7.3 (min = 3, max = 36) and they had taught pupils with ASD for an average of 5.4 ± 4.9 years (min = 1, max = 17). Regarding school level, 96.1% were teaching in a preschool or an elementary school and 3.8% were teaching in high school. In addition, 58.3% had previous experience with a pupil with another type of disability. A special needs assistant was present in the class for 58.8% of teachers.

The second group (G2) consisted of teachers ($n = 50$) working in a support class in a mainstream school ($n = 41$) or in a specialized institution ($n = 9$). Ninety-four percent were women and the mean age was 37.9 ± 7.0 years (min = 28.3, max = 56.9). At the time of recruitment, their mean number of years in the teaching profession was 12.3 ± 6.6 (min = 1, max = 32) and they had taught pupils with ASD for an average of 8.0 ± 5.0 years (min = 0, max = 20). Seventy percent (70%) also had previous experience with a pupil with another type of disability. A special needs assistant was present in class for 97.6% of teachers. We did not collect school-level information from this group due to the large variability of pupil characteristics across preschool, elementary and high school. Indeed, G2 comprised teachers employed in special educational settings that spanned various age group, academic levels, and levels of functioning.

The third group consisted of teachers who were teaching to typically developing pupils only that is to say that they did not have children with ASD in their class at the time of recruitment ($n = 39$). They constituted the group of regular teachers. Ninety-two percent were women and the mean age was 41.9 ± 9.6 years (min = 24.2, max = 60.1). At the time of recruitment, their mean number of years in the teaching profession was 16.8 ± 9.5 and 53.8% (min = 1, max = 35) had previous experience with a pupil having a disability. Regarding school level, 78.9% were teaching in a preschool or an

Table 1
Sociodemographic and occupational characteristics in the sample ($N = 115$).

		G1 Mainstream class with ASD ($n = 26$)	G2 Specialized educational setting with ASD (class/institution) ($n = 50$)	G3 Regular teachers without ASD ($n = 39$)
Educational setting	Support class in a mainstream school	0%	82%	0%
	Support class in a specialized institution	0%	18%	0%
	Preschool or elementary school	96.1%	0%	78.9%
	High school	3.8%	0%	21.1%
Gender	Men	4%	6%	8%
	Women	96%	94%	92%
Experience with another type of disability	Yes	58.3%	70%	53.8%
	No	41.7%	30%	46.2%
Presence of a special needs assistant in the class	Yes	58.8%	97.6%	0%
	No	41.2%	2.4%	0%
Mean age		39.6 (8.8)	37.9 (7)	41.9 (9.6)
Number of years in teaching profession		13.8 (7.3)	12.3 (6.6)	16.8 (9.5)
Number of years in teaching of pupils with ASD		5.4 (4.9)	8 (5)	

elementary school and 21.1% were teaching in high school. There was no special needs assistant in the class.

The results of chi-square tests and analyses of variance revealed no significant difference between the three groups in terms of gender, $\chi^2(2, N = 115) = 0.40$; $p = 0.817$ and age, $F(2,98) = 2.43$; $p = 0.94$, and no significant difference between G1 and G2 in terms of years of experience with pupils diagnosed with ASD, $F(2,60) = 2.39$; $p = 0.101$. However, the overall analyses of variance revealed a significant group difference in terms of years of experience in the teaching profession, $F(2,114) = 3.568$; $p = 0.031$. Indeed, post hoc analysis indicated that the group of regular teachers (G3; $M = 16.79$, $SD = 9.50$) had significantly more experience in the teaching profession than the teachers in specialized settings (G2; $M = 12.34$, $SD = 6.60$).

2.2. Procedure

Teachers were contacted via principals, psychologists and resource persons of pupils with ASD who relayed the call for participation to concerned teachers from multiple French school boards in different regions of the province of Québec (i.e., Montréal, Laval, Montérégie, Estrie and Capitale-Nationale). Teachers who were interested to participate directly contacted the researchers to receive more information. Each teacher received an information letter explaining the purpose of the study and gave their informed consent. Having been given the choice, 87 teachers (75.7%) completed the questionnaires electronically online and 28 teachers (24.3%) completed a paper version.

2.3. Materials and measures

Each participant completed a questionnaire regarding their sociodemographic and occupational characteristics (i.e., gender, age, seniority in the profession, previous experience of children with ASD and with other disabilities) and six standardized questionnaires. The French version of the sociodemographic questionnaire is presented in the Annex A. Completion time was approximately 1 h, for the total of 158 items. The constructs of interest and their measures are described here below.

General self-efficacy is defined as individuals' perception of their ability to perform across a variety of situations (Judge, Erez, & Bono, 1998). According to several studies, the perceived feeling of general self-efficacy is a protective factor against burnout (Shoji et al., 2015). This measure was evaluated using the French adaptation of the General Self-Efficacy Scale (GSES; Jerusalem & Schwarzer, 1992; Schwarzer & Jerusalem, 1995). The GSES consists of 10 items rated on a four-point scale (1 = strongly disagree to 4 = strongly agree) and is designed to assess perceived self-efficacy regarding coping and adaptation abilities in both, daily activities and isolated stressful events. The high validity and reliability of the scale has been established in many studies across various research contexts and ethnically diverse populations (Luszczynska, Scholz, & Schwarzer, 2005). The scale had a Cronbach's alpha of 0.83 in this study. A higher score indicates greater self-efficacy.

Empathizing is defined as the tendency to identify another person's emotions and thoughts, and to respond with an appropriate emotion (Baron-Cohen, 2004). The French adaptation of the Empathy Quotient (EQ) was used to assess empathic abilities as a dispositional personal resource (Baron-Cohen & Wheelwright, 2004; Berthoz, Wessa, Kedia, Wicker, & Grèzes, 2008). The EQ is a 60-item (40 empathy-related, 20 fillers) questionnaire designed to evaluate empathy level through three factors: (1) cognitive empathy, (2) emotional empathy and (3) social skills (Lawrence,

Shaw, Baker, Baron-Cohen, & David, 2004). Responses are given on a four-point scale (1 = strongly agree to 4 = strongly disagree). This questionnaire has been shown to have high validity, good test-retest reliability and internal consistency (Berthoz et al., 2008; Lawrence et al., 2004). In this study, Cronbach's alpha was 0.85 for cognitive empathy, 0.68 for emotional empathy and 0.23 for social skills. For the purpose of the study, and due to a very low Cronbach's alpha for social skills, we only kept two scores of empathy for the analysis (i.e., cognitive and emotional). Higher scores indicate greater empathy.

Within contemporary stress theory, appraisals are usually defined as the final common path for both behavioral and health outcomes (Monroe & Kelley, 1995). The French adaptation of the Appraisal of Life Events Scale (ALES; Cappe et al., 2016; Cappe, Wolff, Bobet, & Adrien, 2011; Ferguson, Matthews, & Cox, 1999) was used to assess teachers' stress related to teaching pupils with ASD. ALES consists of 16 adjectives rated on a six-point scale (0 = not at all to 5 = very much) designed to elicit teachers' cognitive appraisal in terms of threat (6 items), loss (4 items) and challenge (6 items). This scale has been shown to have adequate factor structure, good test-retest reliability, acceptable internal reliabilities and good construct validity (Cappe et al., 2016; Ferguson et al., 1999). In this study, Cronbach's alpha was 0.80 for items related to threat, 0.82 for items related to loss and 0.91 for items related to challenge.

The concept of social support refers to the way an individual perceives the help received from others (Rasclé, Bruchon-Schweitzer, & Sarason, 2005). A French questionnaire assessing perceived social support (*Questionnaire de soutien social perçu*, QSSP; Cappe et al., 2011; Koleck, 2000) was used to estimate the availability (i.e., number of people) and quality (i.e., degree of satisfaction with the help obtained) of social support from colleagues, friends, family and professionals. This questionnaire is composed of four questions related to the primary aspects of social support: (1) affective, (2) instructive, (3) esteem, and (4) financial aspects. Each question was divided into two parts. First, teachers indicated how many people would be available to help them in the described situation. Next, they specified their degree of satisfaction with the received assistance on a six-point scale (0 = very dissatisfied to 5 = very satisfied). The good internal consistency of the scale has been demonstrated (Cappe et al., 2011; Koleck, 2000). In this study, Cronbach's alpha was 0.81 for the availability of social support and 0.83 for the satisfaction of social support. Higher scores indicate better social support.

According to the transactional model of stress, coping is defined as a particular transaction between the subject and his environment in which the situation is evaluated by the subject as exceeding his resources and endangering his well-being (Lazarus & Folkman, 1984). A French version of the Ways of Coping Checklist - Revised (WCC-R; Cappe et al., 2011; Cousson, Bruchon-Schweitzer, Quintard, Nuissier, & Rasclé, 1996; Vitaliano, Russo, Carr, Maiuro, & Becker, 1985) was used to evaluate coping strategies. Respondents indicated their degree of agreement with 27 items, on a four-point scale (0 = no to 3 = yes), about problem-solving strategies, emotion-focused strategies and social support-seeking strategies. This scale has been shown to have adequate factor structure, internal reliability and construct validity (Cousson et al., 1996). In this study, Cronbach's alpha was 0.77 for social support, 0.81 for emotion-focus strategies and 0.83 for problem-solving strategies. Higher scores for problem-solving strategies indicate that respondents make more active efforts to deal with stressful events. Higher scores for emotion-focused strategies indicate that respondents concentrate their efforts on managing the emotional

consequences of stressful events. A higher social support-seeking score indicates that the respondent copes with stressful events by seeking assistance, information, advice, sympathy or emotional support from others.

Burnout generally refers to a three-dimensional syndrome including emotional exhaustion, depersonalization (or cynicism), and reduced personal accomplishment that develops in response to chronic occupational stress (Maslach & Jackson, 1981). The French adaptation of the Maslach Burnout Inventory was used to assess teacher burnout (MBI; Dion & Tessier, 1994; Maslach, Jackson, & Leiter, 1986). The MBI determines levels of burnout on its three components (emotional exhaustion, depersonalization and personal accomplishment). Each of the three scores is calculated using a 7-point frequency scale (0 = never to 6 = every day). The emotional exhaustion subscale has nine questions measuring fatigue, frustration, and stress. The depersonalization subscale contains five items describing a lack of feeling and an impersonal response towards pupils. The eight items of the personal accomplishment subscale describe feelings of competence and efficacy of the teacher's own work. The higher the score for emotional exhaustion and depersonalization, the worse the status is. Conversely, for personal accomplishment, the lower the score, the worse the status is. The MBI proposes thresholds indicating low, moderate or high levels in all three dimensions of burnout (Maslach et al., 1986). For emotional exhaustion, a score between 18 and 29 and a score above 29 correspond to moderate and high levels, respectively. Regarding depersonalization, a score between 6 and 11 and a score greater than 11 correspond to moderate and high levels, respectively. Lastly, for personal accomplishment, a score between 34 and 39 and a score above 39 correspond to a moderate and a low sense of personal accomplishment, respectively (Maslach et al., 1986). The reliability and validity of the instrument have been repeatedly confirmed (Dion & Tessier, 1994; Maslach et al., 1986; Schaufeli, Bakker, Hoogduin, Schaap, & Kladler, 2001). In this study, Cronbach's alpha was 0.55 for depersonalization, 0.92 for emotional exhaustion and 0.64 for personal accomplishment. Although the internal consistency for depersonalization (0.55) was rather low, according to Schaufeli et al. (2001) it is not unusual for it to drop below 0.70.

2.4. Statistical analysis

Analyses of co-variance (single-factor ANCOVA) with planned contrasts were conducted to explore between-group differences in self-efficacy, empathy, perceived stress, perceived social support, coping strategies and burnout, while controlling for experience in the teaching profession, which was significantly more important for the group of regular teachers (G3). Next, multiple linear regression analyses were conducted, using a stepwise approach, regressing each burnout dimension on the correlated independent variables (self-efficacy, empathy, perceived stress, perceived social support and coping strategies). All statistical analyses were performed with SPSS (IBM, version 21).

3. Results

3.1. Impact of the educational setting on dispositional and transactional variables, and burnout

The ANCOVA results are presented in Table 2. The covariate, experience in the teaching profession, was exclusively and positively correlated with the perceived social support from friends, $F(1,111) = 8.58, p = 0.004$. While controlling for the experience in

the teaching profession, results indicated that dimensions of perceived stress differed significantly between groups in terms of challenge, $F(2,110) = 7.49, p = 0.001$. Teachers of children with ASD in specialized settings (G2) and regular teachers (G3) evaluated their experience of teaching as a challenge to a greater extent than teachers of children with ASD in a mainstream class (G1).

We found significant differences between groups concerning perceived social support in terms of informative support, $F(2,111) = 4.57, p = 0.012$, and affective support, $F(2,111) = 4.37, p = 0.015$. Planned contrasts showed that teachers of children with ASD (G1 and G2) perceived significantly less informative support than regular teachers (G3). Teachers of children with ASD from a mainstream class (G1) also perceived significantly less emotional support than those in specialized settings (G2).

Regarding coping strategies, we found significant differences related to the use of problem-solving, $F(2,106) = 3.86, p = 0.024$, and social support-seeking strategies, $F(2,105) = 3.76, p = 0.026$. Teachers in specialized settings (G2) relied significantly more on problem-solving and social support-seeking strategies than teachers of children with ASD in a mainstream class (G1).

Lastly, we found significant differences between groups concerning the emotional exhaustion, $F(2,111) = 3.07, p = 0.051$, and depersonalization, $F(2,111) = 12.72, p < 0.001$ dimensions of burnout. The group of regular teachers (G3) showed significantly more emotional exhaustion than teachers of children with ASD in a mainstream class (G1) and significantly more depersonalization than teachers in specialized settings (G2).

3.2. Relationships between dispositional and transactional variables and burnout

The results of multiple regression analyses are presented in Table 3. For teachers of children with ASD in a mainstream class (G1), the scores of experience viewed as a loss ($\beta = 0.54$) accounted for 25.9% of the total variance for emotional exhaustion, $F(1,24) = 9.72, p = 0.01$. The score for social support from colleagues ($\beta = 0.43$) accounted for 14.8% of the total variance for depersonalization, $F(1,24) = 5.34, p = 0.03$. The score for social support from family ($\beta = 0.39$) accounted for 11.9% of the total variance for personal accomplishment, $F(1,24) = 4.37, p = 0.05$.

For teachers of children with ASD in a specialized setting (G2), the score of experience viewed as a loss ($\beta = 0.38$) accounted for 12.8% of the total variance for emotional exhaustion, $F(1,48) = 8.18, p = 0.01$. The scores for experience viewed as a loss ($\beta = 0.28$) and as a challenge ($\beta = -0.31$) accounted for 12.9% of the total variance for depersonalization, $F(1,48) = 4.62, p = 0.02$. The scores for self-efficacy ($\beta = 0.49$) and social support from family ($\beta = 0.31$) accounted for 30.6% of the total variance for personal accomplishment, $F(1,48) = 11.79, p = 0.00$.

4. Discussion

This study had two goals. First, we compared the experience of teachers working with pupils with ASD according to their distinct educational setting, through self-efficacy, empathy, perceived stress, perceived social support, coping strategies and burnout. Secondly, we investigated the influence of the dispositional and transactional variables on the three dimension of burnout.

4.1. Between-group differences: self-efficacy, empathy, perceived stress, perceived social support, coping strategies, and burnout

Our results show that teachers of children with ASD from

Table 2

Comparison of means for dispositional and transactional variables, and burnout dimensions, while controlling for the effect of years of experience in the teaching profession.

		Type of teacher			ANCOVA			
		G1 - Mainstream class with ASD (n = 26)	G2 - Specialized educational setting with ASD (class/institution) (n = 50)	G3 - Regular teachers without ASD (n = 39)	F	P	η^2	Post-hoc
		M (SD)	M (SD)	M (SD)				
Empathy	Cognitive empathy	1.92 (2.53)	1.64 (2.78)	1.92 (2.33)	0.07	0.93	0.001	1 > 2 1 < 3 2 < 3
	Emotional empathy	2.13 (2.22)	1.78 (2.47)	1.59 (1.55)	0.46	0.63	0.008	1 > 2 1 > 3 2 > 3
Self-efficacy	Perceived self-efficacy	20.96 (3.34)	21.10 (3.40)	19.85 (4.69)	1.14	0.32	0.020	1 < 2 1 > 3 2 > 3
Perceived stress	Viewed as a threat	4.65 (5.79)	4.66 (4.48)	6.33 (4.77)	1.11	0.34	0.020	1 < 2 1 < 3 2 < 3
	Viewed as a challenge	20.31 (5.94)	25.42 (5.36)	24.26 (5.34)	7.49	0.001**	0.118	1 < 2 1 < 3 2 > 3
	Viewed as a loss	1.88 (3.31)	1.64 (2.28)	3.44 (3.96)	2.95	0.06	0.050	1 > 2 1 < 3 2 < 3
Perceived social support	Esteem support	10.12 (6.48)	11.98 (6.76)	13.64 (7.40)	2.02	0.14	0.035	1 < 2 1 < 3 2 < 3
	Informative support	8.65 (9.99)	9.60 (6.20)	13.67 (7.51)	4.57	0.01**	0.076	1 < 2 1 < 3 2 < 3
	Affective support	7.04 (4.98)	10.82 (5.69)	9.46 (4.76)	4.37	0.02*	0.073	1 < 2 1 < 3 2 > 3
	Material support	3.81 (5.53)	5.10 (4.22)	4.15 (3.48)	0.64	0.53	0.011	1 < 2 1 < 3 2 > 3
	Colleague support	11.65 (11.07)	15.3 (10.95)	16.82 (10.55)	1.75	0.18	0.030	1 < 2 1 < 3 2 < 3
	Friend support	6.73 (7.71)	9.26 (6.83)	9.87 (6.90)	2.45	0.09	0.042	1 < 2 1 < 3 2 > 3
	Family support	6.73 (4.35)	8.44 (5.75)	9.97 (6.50)	2.50	0.09	0.043	1 < 2 1 < 3 2 > 3
	Professional support	3.19 (2.90)	3.46 (4.28)	3.08 (2.79)	0.15	0.86	0.003	1 < 2 1 > 3 2 > 3
	Support - availability	29.62 (22.46)	37.50 (18.50)	40.92 (19.61)	2.73	0.07	0.047	1 < 2 1 < 3 2 < 3
	Support - satisfaction	15.24 (3.63)	14.44 (3.31)	14.92 (2.89)	0.50	0.60	0.009	1 > 2 1 > 3 2 < 3
Coping strategies	Problem-solving	17.67 (6.06)	21.26 (4.61)	19.23 (5.58)	3.86	0.02*	0.068	1 < 2 1 < 3 2 > 3
	Emotion-focused	7.95 (5.52)	10.00 (5.38)	10.79 (6.20)	1.70	0.19	0.031	1 < 2 1 < 3 2 < 3
	Social support	14.80 (5.36)	17.86 (3.69)	16.23 (4.27)	3.76	0.03*	0.067	1 < 2 1 < 3 2 > 3
Burnout dimensions	Emotional exhaustion	16.00 (10.16)	18.06 (9.02)	22.59 (13.80)	3.07	0.05*	0.052	1 < 2 1 < 3 2 < 3
	Depersonalization	3.54 (4.08)	2.00 (2.47)	5.72 (4.73)	12.72	0.00***	0.186	1 > 2 1 < 3 2 < 3
	Personal accomplishment	39.00 (5.74)	40.44 (5.10)	38.15 (5.23)	2.41	0.16	0.033	1 < 2 1 > 3 2 > 3

Note. n = Sample size; M = mean; SD = standard deviation; F = f value; p = p value; η^2 = Eta-squared. The significant differences, after Post-hoc test, are marked in bold.

*p < 0.05.

**p < 0.01.

***p < 0.001.

Table 3

Influence of self-efficacy, empathy, perceived stress, perceived social support and coping strategies on the three dimensions of teacher burnout.

Predicted variables	Independent variables	B	p	Adjusted R ²	F	p
G1 - Mainstream class with ASD (n = 26)						
Emotional exhaustion	Experience viewed as a loss	0.537	0.005	0.259	9.723	0.005**
Depersonalization	Colleague social support	0.427	0.052	0.148	5.343	0.03*
Personal accomplishment	Family social support	0.392	0.047	0.119	4.368	0.047*
G2 - Specialized settings with ASD (class/institution) (n = 50)						
Emotional exhaustion	Experience viewed as a loss	0.382	0.006	0.128	8.177	0.006**
Depersonalization	Experience viewed as a loss	0.275	0.046	0.129	4.632	0.015*
	Experience viewed as a challenge	-0.314	0.047			
Personal accomplishment	Self-efficacy	0.486	0.000	0.306	11.794	0.000***
	Social support from family	0.305	0.014			

Note. *p < 0.05, **p < 0.01, ***p < 0.001.

mainstream classes and specialized settings report significantly lower levels of burnout than regular teachers. This result is inconsistent with previous studies reporting that teachers of children with special needs are typically more vulnerable to stress and burnout than matched control groups (Gersten et al., 2001). However, there is evidence in the literature in line with our finding indicating higher rates of burnout in regular teachers than in special education teachers (Braun & Carlotta, 2014). Important levels of enthusiasm among special education teachers and individual characteristics (e.g., personality, age, experience, gender) could explain these results and thus account for our results. Moreover the recruitment of teachers in our sample could also be at the root of

these results. Indeed, teachers motivated to participate in our study may have a positive bias towards the inclusion of children with special needs in their class. This interpretation is supported by previous findings that have pointed out the importance of positive attitudes toward disabled people for a successful inclusive education. (Humphrey & Symes, 2013). For instance, Avramidis and Norwich (2002) review of the literature suggests that teachers' attitudes strongly depend on the nature and the severity of the disabling condition and on physical and human resources available. However, further research should state on the influence of attitudes toward inclusion and autism on psychological adjustment and burnout. Some evidence in this vein is brought by Kelly and Barnes-

Holmes (2013), who show that implicit negative attitudes toward children with ASD are related to burnout.

A second result important to discuss is that compared to the normative sample used in the MBI validation (Maslach et al., 1986), teachers of children with ASD in mainstream classes in our sample reported lower levels of emotional exhaustion and depersonalization, but also lower levels of personal accomplishment. This result is comparable to teachers in specialized settings, who reported moderate levels of emotional exhaustion, and low levels of depersonalization and personal accomplishment. Although teachers of children with ASD did not appear to experience burnout, they showed signs of underachievement.

Teachers of children with ASD in mainstream classes were significantly different from regular teachers in terms of perceived stress, perceived social support and burnout. Specifically, this group reported that they appraised their situation significantly less as a challenge than regular teachers. In fact, they hardly appraised their experience as psychologically beneficial, neither did they view it as an opportunity to learn and improve their skills and ability. This group also reported that they perceived less informative support. The lack of training in these teachers can account this result. Indeed, research show that mainstream teachers do not feel well trained or competent to teach students with ASD (Avramidis & Norwich, 2002; Robertson, Chamberlain, & Kasari, 2003). Extensive training at pre- and in-service level should therefore be a priority, as it appears to be the critical factor for implementing the inclusion policy (Avramidis & Norwich, 2002). Although mainstream classes teachers of students with ASD appraised the situation less as positive experience and lacked informative support, they reported significantly less emotional exhaustion than regular teachers. This suggests that teachers of children with ASD in mainstream classes may not be at greater risk of developing burnout than regular teachers, despite the way they appraise their situation.

Comparisons between teachers from specialized settings and regular teachers indicated that the two groups differed significantly in terms of perceived social support and burnout. Similarly to teachers of children with ASD in mainstream classes, teachers from specialized settings also reported that they perceived less informative support than regular teachers.

Since pupils with ASD present multiple heterogeneous needs, as well as various learning styles, teachers may feel unprepared to teach all their pupils with ASD effectively. This could indicate the feeling of inadequacy and the perception of being unprepared to deal with children with ASD as found in previous studies (Robertson et al., 2003). As the teachers' beliefs and attitudes toward inclusion are influenced by training and professional development opportunities, further research should deepen this question specifically for the educational inclusion of pupils with ASD.

Moreover our results suggest that teachers of children with ASD use similar coping strategies and have comparable perceptions of self-efficacy regarding their coping and adaptation abilities to regular teachers. Likewise, their perceived capacities for empathy are close to those of regular teachers. This specific finding contrasts with the results of Klis and Kossewska (1996) who found significantly higher levels of emotional and cognitive empathy in special education teachers than in regular high school teachers.

4.2. *Impact of the educational setting in teaching pupils with ASD*

In this study, significant differences were observed between teachers of children with ASD according to the educational setting.

Teachers in the two groups differed in terms of perceived stress, perceived social support and coping strategies. However, they did not differ in terms of dispositional variables (i.e., empathy, self-efficacy) and burnout dimensions. Teachers of children with ASD in mainstream classes reported that they appraised their situation significantly less as a challenge than teachers from specialized settings. Teachers from specialized settings in our sample chose to work with disabled children as they graduated from an academic program specific to special education. Moreover, specialized settings commonly provide teachers with adapted educational materials and professional resources (Nistor & Chilin, 2013). Similarly to the results of Shin et al. (2014), in our study teachers of children with ASD in mainstream classes reported using significantly fewer effective problem-solving and social support-seeking coping strategies. This result could account for why teachers of children with ASD in mainstream classes reported less affective support. Since they cannot cope effectively with stress, they may need more empathy, kindness and expression of trust from their significant others.

4.3. *Relationship between dispositional variables, transactional variables and burnout*

Multiple regression results showed that self-efficacy, perceived stress and perceived social support were predictive factors of burnout in teachers of pupils with ASD. More specifically, they indicated that the way teachers of children with ASD appraised stress predicted their level of burnout. When these teachers perceived the stressful situation as a loss, their level of emotional exhaustion increased. Viewing the experience as a loss also predicted an increased level of depersonalization, but exclusively in teachers from specialized settings. Conversely, when teachers from specialized settings reported appraising their situation as a challenge, their level of depersonalization decreased. These results have important clinical and training implications for teachers of children with ASD. For example, more attention should be paid to those who report viewing their experience as a loss because they are likely to have more burnout symptoms.

Social support also seemed to significantly influence burnout in teachers of children with ASD. Social support from family predicted personal accomplishment in the two groups of teachers with ASD pupils. As mentioned by Baghdadli (2011), teachers of pupils with ASD are likely to experience feelings of isolation and poor partnerships with work-related stakeholders. In our study when teachers of pupils with ASD in a mainstream class reported that they received support from colleagues, their level of depersonalization increased. However, social support is known to be beneficial and protective only when the type and source of the support is consistent with the stressful situation, as well as the needs and expectations of the individual (House, 1981). Therefore one could argue that the type and the efficacy of the support of colleague who are not in the same situation is an important data to take into account. Teachers of children with ASD in a mainstream class should therefore seek support from colleagues experiencing a similar situation.

A higher level of general self-efficacy in teachers from specialized settings predicted a greater feeling of personal accomplishment. This result is in line with previous studies that have indicated a lower level of burnout in teachers with a high perception of self-efficacy (Skaalvik & Skaalvik, 2010). However, as mentioned by Skaalvik and Skaalvik (2010), the relationship between self-efficacy and burnout in teachers is more likely to be reciprocal.

Finally, in our study empathy was not related to burnout. However, past research associated empathy and emotional intelligence in teachers with a more positive attitude towards students with disabilities (Barr, 2013), greater satisfaction with work and a lower risk of burnout (Platsidou, 2010). Further studies should clarify how empathy impacts psychological adjustment in teachers.

4.4. Limitations

This study brings up interesting findings but could have been affected by several shortcomings. First, the vast majority of participants were women and gender could have influenced our results (González-Morales, Rodríguez, & Peiró, 2010). Moreover the sample comprised fewer teachers of children with ASD in mainstream classes than teachers in specialized settings and regular teachers. Besides, teachers were recruited from different schools and information about school environmental factors related to burnout (e.g., poor work environment) was not taken into account (Antonioni et al., 2009). Similarly we did not have information on the regular teacher previous experience with students with ASD, on the type of teachers' experiences (from all three groups) in working with children with ASD and on the specific educational training they received. In addition, recruitment was carried out on voluntary basis, which may have led to a biased selection of highly motivated teachers who advocated inclusion for children with ASD, which is not representative of all teachers of pupils with ASD. Indeed, we do not know how many teachers were solicited, nor the percentage of negative responses. Moreover, specialized teachers in this study were employed in special educational settings that spanned various age group, academic levels, and levels of functioning, which created a heterogeneous group. We did not take into account the nature and severity of the pupils' behaviors, nor the pupils' demographic differences across groups. Therefore, the results of this study could hardly be generalized to the teacher population.

The questionnaires we used were not specific to a teacher population and the large number of items to fill in length could have led to participants' "survey fatigue" (Porter, Whitcomb, & Weitzer, 2004). Moreover, the Cronbach's alpha obtained for the depersonalization dimension of the MBI is equal to 0.55, which is low and unsatisfactory. Results derived from this measure should be interpreted with caution. We nevertheless decided to keep this dimension in our statistical analyses because while all Cronbach's alphas are above 0.70 in the American version of the MBI, the Cronbach's alphas in the French version are only satisfactory for the dimensions of emotional exhaustion and personal accomplishment (Pezet-Langevin, 1997). The reliability of the depersonalization dimension in the French version of the MBI is unsatisfactory (Cronbach's alpha below 0.70 in multiple studies), as opposed to the English and German versions. The low internal consistency for this dimension seems to be specific to the French version and may results from the cultural and semantic context (Langevin, Boini, François, & Riou, 2012). Two other elements can be suggested to explain this observation: the social desirability effect and the small number of items in this questionnaire (Langevin et al., 2012).

Finally, our results should be replicated while controlling for the potentially confounding elements discussed above. A mixed design, including interviews and a longitudinal method, as well as the use of teacher-specific tools, would give a better understanding of the teachers' situation and their specific burnout predictors in terms of risk factors but especially in terms of protective factors.

5. Conclusions

The results of the current study showed that teachers of pupils with ASD did not exhibit more signs of burnout than regular teachers. These results are encouraging since good psychological health in teachers influences the quality of teaching and the well-being of pupils. Moreover, these findings are positive regarding current inclusion methods and policies in Québec (Canada), which seem to be fairly favorable to teachers of children with disabilities. Nevertheless, our findings highlight certain risk factors in teachers of pupils with ASD. For example, the way they appraise their teaching experience and the lack of support they report is likely to contribute to symptoms of burnout and to feelings of unsuccessful achievement. Our results also suggest that the educational setting influences the ways teachers of children with ASD cope with stress. They provide suitable means to prevent stress and improve the well-being of teachers facing the challenge of educational inclusion. For instance, teachers of pupils with ASD could follow an informative training program on inclusion and special features of ASD. They could also receive training in interpersonal communication to promote better social relationships with pupils and work-related stakeholders. Teachers of pupils with ASD in mainstream classes should be encouraged to confront and appraise the stressors in teaching as challenging and learn to manage stress with effective coping strategies. Efforts to bring about such changes could include mindfulness training for teachers, for this approach to stress management has proved effective in acting upon the perceptions of stressful situations and ways of coping with stress, and is linked to better class organization, increased self-compassion and empathy, as well as decreased stress and burnout (Beshai, McAlpine, Weare, & Kuyken, 2015). Such training should be offered as part of the teacher's professional development.

Ethical approval

The study received ethical approval from the *Comité institutionnel d'éthique de la recherche avec des êtres humains (CIEREH)* of the *Université du Québec à Montréal (UQAM)* and the authors confirm that the contents of the manuscript are consistent with the *APA Ethical Principles of Psychologists and Code of Conduct, pertaining to Research and Publication*.

Conflict of interest

The authors declare that they have no conflict of interest.

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Annex A

The French version of the sociodemographic questionnaire.

1) Vous êtes : un homme une femme

Votre date de naissance (jj/mm/aa) :/...../.....

2) Vos années d'expérience en tant qu'enseignant : ans

Vos années d'expérience auprès d'enfants ayant un trouble du spectre de l'autisme :

..... ans

Vos années d'expérience auprès d'enfants ayant un autre handicap :

Précisez le handicap et vos années d'expérience :

1) ; années d'expérience : ans

2) ; années d'expérience : ans

3) ; années d'expérience : ans

4) ; années d'expérience : ans

3) Actuellement, vous êtes enseignant en :

Classe ordinaire

Précisez : Pré-scolaire Primaire

Secondaire Post-secondaire

Classe spécialisée

École spécialisée

4) Y a-t-il un (ou des) éducateur(s) présent(s) dans votre classe pour l'(les)enfant(s) qui

présente(nt) un trouble du spectre de l'autisme ? Oui Non

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