

The Benefits of Supporting the Autonomy of Individuals with Mild Intellectual Disabilities: An Experimental Study

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Background The benefits of autonomy support with the general population have been demonstrated numerous times. However, little research has been conducted to verify if these benefits apply to people with special needs. **Methods** The goal of the study was to examine whether autonomy support (AS) can foster the sense of autonomy of people with a mild intellectual disabilities (MIDs) and improve their experience while engaging in an important but unpleasant learning activity. This experiment compares the effects of two contexts: with and without AS. All participants ($N = 51$) had a mild intellectual disability and were recruited from rehabilitation centres.

Results Compared to participants in the control group, participants in the AS group tended to experience greater autonomy satisfaction and tended to perceive more value to the activity. They were also significantly more engaged in it, and they experienced a steeper decrease in anxiety over time.

Conclusions This study suggests that the benefits of AS extend to individuals with mild intellectual disability.

Keywords: autonomy support, engagement, internalization, mild intellectual disability, self-determination, well-being

Introduction

Studies have shown that the level of social participation (Wehmeyer & Schwartz 1997; Wehmeyer & Palmer 2003) and quality of life of people with an intellectual disability (Wehmeyer & Schwartz 1998; Wehmeyer & Schalock 2001; Lachapelle *et al.* 2005; Chou *et al.* 2007) are linked to their level of self-determination. The development of self-determination has thus become a crucial element in the provision of adequate services for this population (Wehmeyer 2007a; Wullick *et al.* 2009). For example, the American Association on Intellectual

and Developmental Disabilities (2010) considers self-determination as a central objective in people with an intellectual disability and recommends that when a personalized intervention plan is being developed, the person's dreams, needs, interests and preferences (Thompson, Bradley, Buntix, Schalock, Shogren, Snell, & Wehmeyer, 2009), that is their need for self-determination, should be prioritized (Ryan & Deci 2000). Wehmeyer & Bolding (2001) have proposed that the development of self-determination in people with an intellectual disability rests not only on their abilities to exert it and on the opportunities to practice it in their environment, but also on the *support* they receive from socialization figures, including the manner in which these figures communicate and interact with them.

Self-determination theory (SDT; Deci & Ryan 2000; Ryan & Deci 2000) postulates that every human being has three basic psychological needs: the need for competence, relatedness and self-determination (also called autonomy). This humanistic theory also explains that all humans have an innate and universal tendency

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to internalize the rules and behaviours that are required of them to function optimally in their social environment. Even though this internalization process is natural, it tends to be facilitated when basic needs are satisfied, while it is hindered when needs are thwarted (Deci & Ryan 2000; Ryan & Deci 2000). It is important to note that a person is self-determined when he/she acts according to his/her interests, needs and values. It is not a question of 'not depending on anybody' but rather to feel that our actions stem from ourselves as opposed to being controlled by external (e.g. reward, punishment) or internal forces (e.g. avoid feeling ashamed).

Numerous studies have shown that the more autonomous people feel, the better they learn, perform and feel. This link has been demonstrated across various developmental periods (e.g. infancy, adolescence, adulthood) and contexts (e.g. academic, work, health, sports; Ryan & Deci 2000). The need for autonomy and the benefits that result when it is satisfied are said to be universal (Deci & Ryan 2000). According to Deci (2004), people with an intellectual disability should learn in an environment where their need for autonomy is supported so that they can better learn new activities and experience greater well-being. Despite the acknowledgement of the importance of self-determination, research has shown that it could be challenging to support it in people with an intellectual disability (Hooren *et al.* 2002; Jingree *et al.* 2006; Finlay *et al.* 2008a,b; Pilnick *et al.* 2010; Caouette 2014). For example, one of the obstacles that professionals face is their lack of knowledge of what self-determination is and how to promote it (Wehmeyer *et al.* 2000; Caouette 2014). While socialization agents tend to be more controlling with people with an intellectual disability, Deci (2004) postulates that autonomy support would be equally beneficial to them, even though they are often perceived as being less motivated, more passive and inattentive (Grolnick & Ryan 1990; Witzel & Mercer 2003; Reeve 2009). To our knowledge, no study has yet examined whether support for autonomy, as defined by SDT, can be generalized to people with an intellectual disability.

According to SDT, the manner in which socialization agents communicate and interact with a person with an intellectual disability can more or less satisfy his/her need for psychological autonomy (Ryan *et al.* 2006). Autonomy support (AS) aims to satisfy this essential psychological need. AS is typically defined in the context of hierarchical relationships (e.g. teacher–student, parent–child) in which the authority figure

acknowledges and considers the other person's perspective (even if it is different from their own), supports his/her initiatives, minimizes the use of controlling strategies and provides sufficient challenges according to the person's developmental level (Ryan *et al.* 2006). In operational terms, AS is defined by four elements: offering rationales with requests (i.e. explain the reason/value), offering choices in the manner to accomplish a task, being empathic towards the other person's perspective (i.e. to recognize and accept the thoughts and feelings) and avoiding controlling language and strategies (e.g. 'you should', threats, rewards, guilt induction; Koestner *et al.* 1984). The goal of this study was to evaluate the effect of AS on the experience of individuals with a mild intellectual disability (MID).

Autonomy support is different from independence promotion (i.e. encouraging to do things without help), permissiveness (i.e. absence of structure) and neglect (i.e. the absence of implication; (Soenens *et al.* 2007; Joussemet *et al.* 2008;). In fact, AS is compatible with structure (i.e. the presence of limits, rules and expectations) and the involvement of socialization agents. Studies have shown that to facilitate the internalization process, socialization agents must be involved, provide structure, all the while supporting the other person's need for autonomy (Sierens *et al.* 2009; Jang *et al.* 2010). The opposite of AS is psychological control: a controlling interpersonal style that hinders the person's autonomy by manipulating, invalidating and forcing him/her to be or act in a certain way (Barber 1996).

Autonomy support has been largely studied amongst normative populations and across diverse domains (Ryan & Deci 2000). Studies have shown that socialization agents who support their subordinate's autonomy promote a wide range of positive effects on behaviour (higher level of engagement, motivation, effort, persistence; Jang 2008; Jang *et al.* 2010; Hardre & Reeve 2003; Reeve *et al.* 2004, 2002; Vallerand *et al.* 1997), emotion (decrease in anxiety, increase in positive affect, interests, decrease in negative affect; Black & Deci 2000; Joussemet *et al.* 2004; Savard *et al.* 2013) and cognition (performance in problem-solving, development of executive functions, increased memory; Boggiano *et al.* 1993; Bernier *et al.* 2010; Cleveland & Morris 2014). Many of these studies used experimental research designs where participants had to learn an important but unpleasant task and/or had to follow an established set of rules. In these studies, AS was compared to a control condition without AS (which consisted of a neutral or controlling interpersonal style). Although limited in

number, some studies have examined the impact of AS on people with special needs (e.g. children and adolescents with emotional and behavioural problems or who have a learning disorder; Deci *et al.* 1992; Grolnick & Ryan 1990; Savard *et al.* 2013). To our knowledge, to date no study conducted within SDT attempted to evaluate the impact of AS (empathy, rational, choice, non-controlling language) on individuals with an intellectual disability. The goal of this study was to evaluate whether AS, as defined by SDT, can satisfy the need for autonomy of individuals with mild intellectual disabilities (MIDs) and whether it can generate some of benefits that have been seen in normative populations.

Anchored within SDT (Ryan & Deci 2000), the study will investigate the effects of AS in a problem-solving context, an important but unpleasant task for this population. Solving problem is a cognitive task that is, in general, more difficult for them (American Association on Intellectual and Developmental Disabilities, 2010; Wehmeyer 1992) and hence is experienced as unpleasant. Compared to the condition without AS (control group with a neutral interpersonal style), it was hypothesized that the AS from a socialization agent (animator) will satisfy the participants' need for autonomy and will lead to motivational, behavioural and emotional (i.e. increase internalization of the inherent value of the task, increase in the level of engagement and decrease in anxiety) benefits. The satisfaction levels of the need for competence and affiliation were measured in addition to the level of autonomy, in order to check the validity of the experimental manipulation, aimed to influence autonomy specifically. No difference between conditions was expected for the levels of competence and affiliation because the goal of the experimental manipulation targeted autonomy specifically, while both competence and affiliation were promoted in both conditions. Indeed, no difference between the conditions for competence and affiliation was expected.

Method

Recruitment

Participants with a mild intellectual disability (MID) were recruited amongst the users of a rehabilitation centre in the Montreal area that offers adaptation, rehabilitation and integration services for people with an intellectual disability. The study's inclusion criteria were the following: be diagnosed with a mild intellectual disability; be at least 12 years old (adolescents and adults were recruited), understand and speak French, having

the capacity to consent independently to research (for participants of 18 years of age or more; or having a parental consent for youths under 18 of age); and be able to complete a questionnaire about one's subjective experience during an activity. Only adolescents and adults were recruited because the task and procedures were designed specifically for this population and would have been inappropriate for children. The exclusion criterion was having a severe elocution problem or a verbal disorder that prevented communication (i.e. an unfamiliar person is unable to understand this person with he/she speaks), having an autism spectrum disorder and not having the capacity to consent to research independently (or not having a parental consent for youth under 18 years old), because all people with a mild intellectual disability do not have the capacity to consent to research.

This study was advised by two institutional review boards (one from the rehabilitation centre and one from the university). Once permission was obtained from both boards, the principal investigator met with the centres' educators to seek their help with recruitment. The educators' role was to identify users who met the inclusion criteria and inform them about the study. Researchers relied on them as they did not have access to participants' files, containing information about diagnostics and intellectual disability level. Next, users who were interested in the study communicated with the researcher by telephone (alone or with help) and scheduled a meeting at their centre.

Participants

Over an initial total of 66 participants, 11 referred participants did not meet the inclusion/exclusion criteria (some had an autism spectrum disorder, a moderate intellectual disability and/or significant communication problems), due to recruitment errors made by some educators, who referred participants who did not meet all of the inclusion criteria. After verifying the inclusion criteria and participants' file with these educators by phone, the data from these 11 participants were removed from the data file before running statistical analysis. In addition, with four participants, the experimental manipulation could not be conducted in a standardized manner for reasons out of the researcher's control (e.g. participant's sickness or behavioural problem, unsettling room change). Hence, the data from these four other participants were not used in the analyses either. The final sample was thus composed of 51 participants (28 women and 23 men) with a mild intellectual disability.

These participants were aged between 16 and 61 years of age ($M = 35.86$; $SD = 13.60$) and were capable of completing the self-report questionnaire (with the help of an assistant).

Procedure

Participants were randomly assigned in one of the two conditions (with or without AS). The principal investigator was in charge of this random assignment. When receiving phone calls from interested individuals, she followed a predetermined table which began with AS (due to the yoked procedure, see Experimental manipulation section) and alternated between both conditions. Thus, when receiving a phone call, she assigned the participant in the next condition on the table. The principal investigator was not blind to the conditions because she was also the animator of the activity and had to know the assignment of participant to use the right experimental manipulation.

Each participant took part in the study individually, with the help of the animator (the principal investigator) and in the presence of an assistant (observer). The consent form, adapted to suit participants' comprehension abilities (simple words and short sentences), was first read aloud and explained in person by the assistant.

The animator introduced herself as a researcher interested in the experience of people who participate in the proposed activity. The assistant was introduced as a person who was there to evaluate the work of the animator. In addition to presenting the consent form, the assistant was responsible for observing the animator and the participants (see Measures section) and to help them complete the questionnaire. The assistant's role was alternately played by one of the research assistants, depending on their availabilities. They were all blind to the goal and experimental manipulation of the study, and they were trained to code the observed measures.

The animator presented the activity stating that it was not a 'test' and told the participant what to expect of the meeting as well as what was expected of him or her (i.e. attentive listening, questions when needed, expression of ideas, respect). She then presented the first problem as an introduction to the activity, which was later used as an example to illustrate the problem-solving method. At the end of the activity, the animator warmly thanked the participant and offered him/her positive constructive feedback on his/her participation before leaving the room, for questionnaire completion with the assistant.

When presenting the questionnaire, the assistant underlined the importance of expressing one's own opinion, which may help the researcher improve the activity. The goal was to diminish the tendency of acquiescence, a phenomenon often observed in people with a mild intellectual disability when completing self-report questionnaires (Finlay & Lyons 2002). The assistant offered help only when necessary and read the items and the multiple choices answers aloud. If a participant seemed confused, the assistant would explain an item using a predetermined script; a recommended procedure to maximize the validity of self-report questionnaires completed by people with a mild intellectual disability (Finlay & Lyons 2002). Upon completing the questionnaire, the participant received a gift certificate of 20\$ (from a popular drugstore selling various products such as make-up and candy) as a compensation for their time as well as a bottle of water with the university's logo (an unexpected thank you gift). Finally, the animator came back into the room for debriefing. She described the research goal and inquired how the participant felt after the activity.

Experimental task

The task was a problem-solving activity on self-assertion. Learning to problem-solve and assert oneself are two important skills to master for people with a mild intellectual disability, as they are essential components to the development of self-determination (Wehmeyer 2007c). In addition, this activity corresponds to the types of activities that are offered to the rehabilitation centres' members during 'group social skills' (M. Joyal, supervisor of clinical activities at the centre, pers. comm., September 20th, 2013). In addition to being ecologically valid, this kind of activity is appropriate for an internalization study, as problem-solving is important but often recognized as being less pleasant and more difficult for individuals with mild intellectual disability (Wehmeyer 2007b; Savard *et al.* 2013).

The activity was composed of two problems, each lasting 20–30 min. The animator taught the method to use to solve these problems (four steps; see Table 1). The problems and their solutions were inspired from the programme 'Thinking it Through' which specifically addresses students with a mild intellectual disability (Foxx & Bittle 1989). The two problems were chosen for their simplicity (few elements) and for their low level of stimulation. Furthermore, they addressed assertiveness,

Table 1 Description of the problem-solving method

Steps	
1	What is the character's goal in the story?
2	Where will the character go to solve his/her problem?
3	Who will he/she go to solve his/her problem?
4	What will he/she say to the chosen person to accomplish his/her goal and to assert his/herself?

with characters having to find a way to express their needs. The problems were illustrated (large comic books), and the animator read them aloud to the participant.

The first problem was read as although it really happened to the animator, to make the activity seem more concrete (see Table 2, problem 1). Next, the participant practised applying the problem-solving method to this first problem with the animator's help, using each of the four steps. Next, the animator presented a second problem (a or b) to the participant to practice the method again with help (see Table 2, problem nos. 2a and 2b).

Experimental manipulation

All participants engaged in this same activity, but it was led with AS or without AS (control group) depending on the experimental condition in which participants were assigned. The animator adopted an interpersonal style that corresponded to the experimental condition, which remained coherent throughout the activity. Based on the procedure in Savard *et al.* (2013), responses to various situations (with or without AS) were prepared in advance. The autonomy-supportive responses were based on prior studies on AS (e.g. Koestner *et al.* 1984; Joussemet *et al.* 2004; Savard *et al.* 2013) and on a parenting programme that includes autonomy-supportive communication skills (Faber & Mazlish, 1980; Faber & Mazlish 2005; Joussemet *et al.* 2014).

The animator followed prepared scripts (with or without AS; see Table 3) to maximize the standardization of each condition and to minimize differences in support for relatedness or competence. These scripts, prepared by the authors, were revised by two special education teachers.¹

¹Scripts are written in French because the population of the study are French-Canadian. Scripts are available upon request.

AS condition

In the AS condition, the animator attempted to actively support the participants' need for autonomy. The script was based on SDT's operational definition of AS (Koestner *et al.* 1984; Deci *et al.* 1994) and included the four main elements of AS (i.e. rationale, empathy, choice and non-controlling language; see Table 3).

First, the animator explained the rationale for the activity, explaining the reasons why it is important to practice problem-solving. The rationale, adapted from a previous study (Savard *et al.* 2013), was simple and short to facilitate the participants' comprehension. The animator asked the participant to find a reason why practising problem-solving may be useful, to first consider his/her perspective and to use it in the activity (see Table 3).

A choice was also offered to participants in the AS group. During the second exercise, they could choose what problem they preferred to solve (problem 2a or 2b, store or restaurant problem; see Table 2). The animator also expressed empathy towards the perspective of the participant throughout the activity. For example, she named the emotions the participant could have had towards the activity (e.g. 'It can be stressful to do a new activity and to also do it with a new person the present authors do not know'). She also named the emotion that the participant seemed to feel, if she detected signs of stress or frustration for example.

Finally, the language used was the least controlling as possible. The animator minimized the use of expressions such as 'You should', 'You have to' or 'I want you to' and used a descriptive language style. For example, when the experimenter presented the solving method, she said, in the AS condition 'As you can see at the board, the method has four steps. To solve the problem, it requires using the four steps. At each step, there is a question the present authors might ask to help us solve the problem' as opposed to 'As you can see at the board, the method has four steps. To solve the problem, you'll have to follow the four steps; one after another, in the right order' in the control condition. The rules of the activity (structure) were also explained to the participant in an impersonal style by referring to the instructions and the rationale behind. (e.g. 'There are some rules that will help us ensure that the activity will go well. This part of the activity requires that the present authors listen carefully') as opposed to (e.g. 'I want to tell you the rules that you will have to follow. First, you have to listen to my instructions'). Using a descriptive language allows participants to focus on the task and permits the minimization of the hierarchy between the animator and

Table 2 Description of the activity's content

<i>Problem no. 1</i>	<i>Problem no. 2</i>
<p>‘Yesterday, at my house, I prepared a cake for a friend’s birthday and while baking, I realized that I didn’t have enough eggs to do the whole recipe. I forgot to buy eggs at the grocery store! So, I stopped baking and decided to go ask my neighbour for eggs’</p> <p>When I arrived in front of her door, I knocked on the door and I told her: ‘Hi, it’s Julie, your neighbour that lives next door from you! I’m missing eggs to make a recipe and I’m in a bit of a hurry! Would you be so kind as to give me some?’ And the neighbour kindly gave me some.</p>	<p>(a) Martin buys a pair of pants at a store. When he gets back home, he realizes that the zipper is broken. What can he do to solve his problem?</p> <p>(b) Karine goes to the restaurant with a friend and she orders spaghetti for dinner. When the waitress brings her meal, she gives her a chicken salad. That’s not what she wanted to eat. What can s/he do to solve his/her problem?</p>

Table 3 Descriptions of the experimental conditions

	<i>With autonomy support</i>	<i>Without autonomy support</i>
Rational	<p>‘Before we begin, I have a question for you. I would like to know if you believe that learning how to solve problems, like we are going to do today together, would help you in real-life? If yes, how could it help you? Oh yes! Practicing can (<i>use the participant’s words</i>)!</p> <p>I would like to tell you why, you and I will do problem-solving activities today. We are practicing problem-solving because as you know, every day, everyone faces problems in life and it requires us to try to find solutions to solve them as best as possible. So, the more we practice solving problems, the easier it would be for us when we will face problems in real life!’</p>	None
Empathy	‘I know that it is not always fun to face problems! Sometimes, we could have a hard time trying to find solutions’	None
Choice	‘Before we start solving the next problem, you will be able to choose the problem you want to solve. You have the choice between two stories and each have a problem that must be solved. You could choose the story you want’	None
Language	‘We are going to practice solving a new problem together’	‘You are going to have to solve a new problem with my help’
Feedback	Descriptive: ‘You just learned all the steps to the problem-solving method’	Evaluative: ‘Super!’, ‘Bravo, you are good!’
Structure	Impersonal: ‘There are some rules that will help us ensure that the activity will go well. This part of the activity requires that we listen carefully’	Personal: ‘I want to tell you the rules that you’ll have to follow. First, you have to listen to my instructions’

the participant (Koestner *et al.* 1984). The positive feedback given at each step was also impersonal; it was descriptive (e.g. ‘You found Jonathan’s goal in the story’) rather than evaluative (‘You are really good!’).

Control condition

In the control condition, the animator communicated with a neutral interpersonal style that did not actively support the participants’ need for autonomy all the while not being controlling. The goal was not to make the condition particularly controlling by trying to hinder

the participants’ need for autonomy, nor to hinder their need for competence or affiliation. This way, while the rationale, empathy and choice elements were absent, no form of psychological control (e.g. invalidation of emotions or pressure; Barber 1996) was included in this condition.

Regarding the second exercise, participants in the control condition did not have the opportunity to choose which problem they preferred to solve. To have an equal number of participants having performed each problem (store and restaurant) in both experimental conditions, the animator chose the problem the last

participant, in the AS group, had chosen ('yoked' procedure; Goodwin 2010).

The language used by the animator in the control condition consisted of common expressions (e.g. 'You must', 'You have to')² to represent language normally used. Finally, the positive feedback given by the animator was evaluative (e.g. 'You are good', 'You did that like a pro!', 'Continue just like that!') thus reflecting the typical feedback often given in educational settings. Furthermore, the instructions given at the beginning of the activity were formulated with commands such as 'Look, Listen to me' instead of being formulated impersonally such as in the AS condition (Reeve 2009; Reeve & Halusic 2009).

Measures

First, individual differences such as the diagnosis for a mild intellectual disability, the age and the gender of participants were collected from their educator. Regarding self-reports, the measures were selected with care, adapted to take participants' cognitive and language limitations into account. All of the items were chosen for the simplicity of their vocabulary and grammatical structure, with four-point response scales going from 'not at all' to 'a lot'. These various precautions were recommended by Finlay & Lyons (2002) to increase the validity of self-report questionnaires for individuals with a mild intellectual disability. Prior to this study, the self-report measures were tested (Emond Pelletier *et al.* 2013) with 12 individuals with a mild intellectual disability, and this pilot study revealed satisfactory internal consistency ($\alpha = 0.76\text{--}0.92$).

Satisfaction of the needs of autonomy, competence and relatedness (self-reports)

The perception of the satisfaction of the needs of autonomy, competence and relatedness during the task was measured using 15 items from the Intrinsic Need Satisfaction scale (Forest & Mageau 2008; Savard *et al.* 2013). Amongst them, five items measured the satisfaction of the need for autonomy ($\alpha = 0.61$; e.g. 'I could do the activity at my own rhythm', 'I felt free to tell my ideas and opinions during the activity'). Four

items measured the satisfaction of the need for competence ($\alpha = 0.73$; e.g. 'I thought I was good', 'I found that I did good in this activity') and six items measured the satisfaction of the need for relatedness ($\alpha = 0.53$; 6 items; e.g. 'I got along with the animator', 'I felt appreciated by the animator') during the activity.

Internalization of the inherent value of the activity (self-report)

The degree of internalization of the activity was reflected in the degree to which participants' perceived it has value/usefulness (Ryan & Deci 2000). The activity's value was measured using the seven items from the 'value/usefulness' subscale of the Intrinsic Motivation Inventory (McAuley *et al.* 1989). These items were translated to French using back translation (Vallerand 1989). In this study, the scale had very good internal consistency ($\alpha = 0.93$; e.g. 'I believe that doing this activity could be beneficial for me', 'I would be willing to do this again because it has some value to me').

Level of engagement (observed)

The observer (one of the two research assistants),³ who was blind to the experimental manipulation, evaluated participants' levels of engagement during the activity, using a scale with five items that has been used in three previous studies with adolescents (Reeve *et al.* 2004; Jang 2008; Jang *et al.* 2010), to measure the behavioural, cognitive and emotional components of engagement during school activities. This instrument measures the frequency and intensity of attention (focused versus dispersed), efforts (passive, slow, minimal effort versus active, rapid, intense effort), verbal participation (verbally silent versus verbally participating), perseverance (gives up easily vs. persists) and positive emotions (flat versus positive emotional tone). In this study, this measure was translated to French using a back translation (Vallerand 1989) and had good internal consistency ($\alpha = 0.78$). Research assistants had received information on the definition of engagement and signs

²Although these expressions are considered to be less autonomy-supportive and reflective of a more controlling style by researchers who work within SDT (Reeve 2009), they are frequently used in day-to-day language and for this reason the present authors included them in the control condition.

³The analyses conducted with the observation data (engagement, anxiety at T1 and T2) were performed with 44 participants instead of 51 because a methodological error occurred: one of the research assistants only viewed participants in the control condition ($n = 7$). This assignment error prevented us from analysing the observational data from these seven participants.

(verbal and non-verbal) to be observed for each of the items of the scale. To our knowledge, it was the first time this instrument was used with people with intellectual disabilities.

Anxiety at the beginning and end of the activity (observed)

Four items ('nervous', 'stressed', 'anxious', 'worried') were chosen from a French adapted version of the PANAS-C (Laurent *et al.* 1999; Savard *et al.* 2013) to measure participants' anxiety. The observer evaluated participants' level of anxiety on a scale from 1 (not at all) to 4 (a lot) at the beginning (T1; first five minutes) and at the end of the activity (T2; last five minutes), to assess how participants' anxiety changes over the course of the activity. The scale had very good internal consistency ($\alpha = 0.95$).

Level of patience of the animator (observed)

The animator's level of patience was measured by the observer, using a scale from 1 (not at all) to 6 (very high). This was performed to control for any individual differences that may have occurred between the two experimental conditions (Savard *et al.* 2013).

Results

Preliminary analyses and analytical strategy

According to Stevens (1996), it is often necessary to adjust the statistical significance level from 0.05 to 0.10 when the sample size per group is small ($n \sim 20$). Opting for the common 0.05 level largely limits the statistical power and the probability to detect significant effects (if they exist). Despite the small sample size in this study ($n \sim 25$ per group instead of 64 as recommended by Cohen 1992) and the high probability of making a type 2 error, the present authors decided to retain the statistical significance level of 0.05. However, marginal results ($P < 0.10$) will be reported and discussed.

Firstly, analyses of variance (ANOVAS) were conducted to evaluate whether the observed variables (participants' levels of engagement and anxiety, animator's level of patience) were significantly different between both assistants who acted as observers. No significant difference was detected between both assistants in terms of the animator's perceived level of patience ($P > 0.05$) and perceived levels of engagement, while significant

differences were found for anxiety at T1 ($F(1, 41) = 4.14$, $P = 0.05$, $\eta^2_{\text{partial}} = 0.09$) and at T2 ($F(1, 41) = 4.15$, $P = 0.05$, $\eta^2_{\text{partial}} = 0.11$). Consequently, observation scores were transformed into Z scores. As such, a participant having an elevated Z score signifies that he was above the average of the other participants observed by the same evaluator, thus permitting the comparison of scores (Haccoun & Cousineau 2007). All analyses pertaining to observed variables used were Z scores.

The descriptive analyses for the main variables of the study are presented in Table 4 while Table 5 presents the results of the correlational analyses. In the light of the correlation pattern, the principal analyses will take into account the age of the participants and their gender as covariables if they correlate significantly ($P < 0.05$) with the dependant variable of interest (see Table 5).

Principal analyses

Table 4 presents the means and standard deviations for each of the main variables according to the experimental conditions. Although the analyses with the observed variables used standardized scores, the pattern of results is similar to the one derived from analyses using raw scores.

Verification of the experimental manipulation

To verify the validity of the experimental manipulation, a series of ANCOVAS were completed to examine whether the two experimental conditions differed in the level of satisfaction of the needs for autonomy, competence and

Table 4 Descriptive analyses

Variables	N	M	SD	Interval	
				Theoretical	Observed
Autonomy	51	3.80	0.36	1–4	2.6–4
Competence	51	3.86	0.30	1–4	2.82–4
Relatedness	50	3.92	0.17	1–4	3.32–4
Value	51	3.74	0.51	1–4	1.81–4
Engagement	42	5.13	0.88	1–7	2.4–6.8
Anxiety T1	43	2.26	1.01	1–4	1–4
Anxiety T2	42	1.80	0.88	1–4	1–4
Animator's patience	41	5.95	0.22	1–6	5–6
Age	51	35.86	13.6	12–...	16–61

The means and standard deviations are reported as raw scores.

Table 5 Bivariate correlations of all variables in the study

Variables	1	2	3	4	5	6	7	8	9	10
1. Autonomy	–									
2. Competence	0.35**	–								
3. Relatedness	0.51***	0.43***	–							
4. Value	0.55***	0.30**	0.37***	–						
5. Engagement ¹	0.05	0.15	0.11	–0.06	–					
6. Anxiety T1 ¹	–0.24	–0.18	–0.41***	–0.28*	–0.46***	–				
7. Anxiety T2 ¹	–0.21	–0.09	–0.34**	–0.27*	–0.40***	0.74***	–			
8. Age	–0.32**	–0.39***	–0.27**	–0.23*	–0.09	0.19	0.15	–		
9. Gender	–0.21	0.06	0.16	–0.24*	0.23	0.09	–0.03	–0.17	–	
10. Animator's patience ¹	–0.12	0.03	–0.09	–0.13	0.25	–0.08	–0.19	–0.002	0.06	–

¹For these variables, the correlational analyses were carried out using standardized scores (Z score).

* $P < 0.10$.

** $P < 0.05$.

*** $P < 0.01$.

relatedness. These analyses controlled for the age of the participants, which was negatively correlated with the satisfaction level of all three needs (r s between -0.27 and -0.39 , p s < 0.05). Furthermore, an ANOVA was conducted to compare the animator's level of patience and to ensure that it did not differ between both groups.

Concerning the need for autonomy, the results of the ANCOVA showed that participants in the AS group tended to report greater satisfaction levels of their need for autonomy ($F(1, 49) = 2.80$, $P = 0.10$, $\eta^2_{\text{partial}} = 0.06$) than participants in the control group (Table 6). Despite the fact that the difference between both groups is marginal, it represented a medium effect size (Cohen 1992).

Table 6 Means and standard deviations of the principal variables of the study, according to the experimental condition

Variables	Autonomy support		Without autonomy support	
	M	SD	M	SD
Autonomy	3.88	0.21	3.73	0.45
Competence	3.90	0.23	3.82	0.35
Relatedness	3.92	0.16	3.92	0.18
Animator's patience	6.00	0	5.92	0.28
Value	3.85	0.27	3.64	0.67
Engagement	5.57	0.68	4.77	0.88
Anxiety T1	2.17	1.00	2.33	1.05
Anxiety T2	1.56	0.92	2.02	0.80

The means and standard deviations presented in this table are all based on raw scores.

No significant difference was found between the two groups in terms of the satisfaction levels for the needs for competence, relatedness or the animator's level of patience (all P values > 0.05 ; Table 6). Despite the marginal difference for autonomy, the experimental manipulation of AS seems to have had the expected effect, by modifying the participants' need for autonomy without affecting the satisfaction of their needs for competence or relatedness (Table 6). These results also confirmed that the animator demonstrated the same amount of patience in both groups.

Internalization of the inherent value of the task

An ANCOVA was conducted to compare the level of inherent value that participants gave to the task. As the perceived task value was significantly related with participants' age as well as with their gender ($F(1, 49) = 3.00$, $P = 0.08$; $M_{\text{women}} = 3.85 > M_{\text{men}} = 3.60$), the analysis controlled for these two covariates. The results revealed that there was a marginal difference between both groups ($F(1, 49) = 2.89$, $P = 0.09$, $\eta^2_{\text{partial}} = 0.06$). As expected, participants in the AS group tended to perceive the task as more valuable than participants in the control group (Table 6). The difference between both groups constituted a medium effect size according to Cohen (1992).

Level of engagement

In terms of participants' engagement, the results of the ANOVA indicated that a significant difference was present between the participants in the AS group and the

control group ($F(1, 41) = 8.85, P = 0.01, \eta^2_{\text{partial}} = 0.18$). Specifically, the participants in the AS group were perceived as being more engaged during the activity by their evaluator compared to participants in the control group. The effect size was large according to Cohen (1992).

Anxiety

Firstly, two ANOVAs were conducted to compare participants' levels of anxiety in both groups at the beginning (T1) and end (T2) of the activity. The results indicated that there was no difference between the two groups at T1 ($P > 0.05$). However, at T2, there was a significant difference between participants in the AS group and those in the control group ($F(1, 41) = 3.76, P = 0.05, \eta^2_{\text{partial}} = 0.08$). Participants in the AS group were rated as being less anxious at T2 by their evaluator than participants in the control group (Table 6). The difference between both groups represents a medium effect size (Cohen 1992).

Finally, a mixed ANOVA was conducted to verify whether the evolution of participants' anxiety differed according to the experimental condition. The results indicated the presence of a significant interaction between time and experimental condition (Lambda de Wilks = 0.91, $F(1, 40) = 3.93, P = 0.05, \eta^2_{\text{partial}} = 0.09$). Figure 1 illustrates participants' evolution of anxiety over time, in each group. While there was a decrease for participants in both groups, the anxiety level of participants in the AS group declined significantly more compared to those for participants in the control group, as observed by their evaluator.

Discussion

The goal of the present study was to evaluate whether providing AS can satisfy the need for autonomy in people with a mild intellectual disability as well as lead to the benefits seen in normative samples. Tested in a learning context, the hypotheses of this study were partly supported. First, participants in the AS group tended to feel more autonomous and to see the problem-solving task as more valuable. Although these group differences were marginal, group means were in the expected direction and consistent with the literature on the benefits of AS (see Deci & Ryan 2008; for a review). Moreover, effect sizes were medium, both for autonomy and task value. According to Kline (2004), Cohen (1988) and Bourque *et al.* (2009), when the statistical power of a test is limited by a small simple

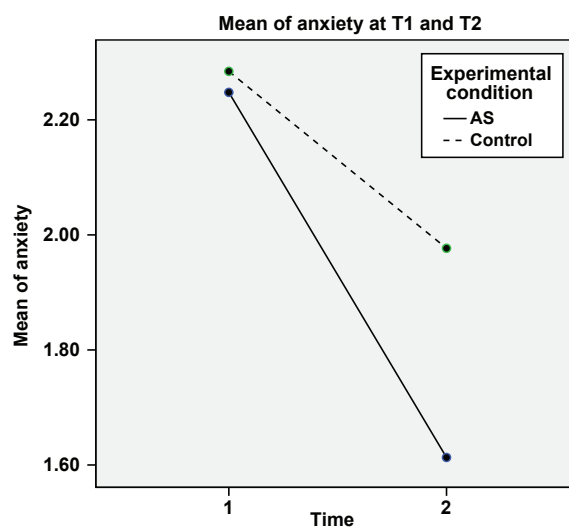


Figure 1 Results of the mixed ANOVA for anxiety at time 1 and time 2 as a function of the experimental condition. Means of anxiety for each experimental condition at time 1 and time 2. To facilitate comprehension, figure is presented with raw scores instead of standardized scores. The same interaction effect between time and experimental condition is observed with both types of scores.

size, it is important to consider the effect size found in addition to the p value, when interpreting a non-significant results.

Compared to other populations, people with a mild intellectual disability tend to present lower intrinsic motivation and higher anxiety (Switzky 2001), potential obstacles for learning new tasks. It is thus encouraging to observe that AS also had a beneficial and significant impact on participants' desire to engage in the activity and on the anxiety they felt throughout the task. In sum, by acknowledging their perspective, explaining the rationale and by adopting an impersonal communication style, it was possible to improve the emotional, motivational experience of participants and their engagement.

In all, participants reported feeling very competent and affiliated during the course of the activity. The satisfaction of these two basic psychological needs was very high and similar in both groups. Methodological and ethical considerations were central in our decision to solely manipulate the support for autonomy. Particular attention was given to conceive an experimental manipulation that would satisfy the needs for competence and relatedness which, unfortunately, are often hindered in the intellectual disability

population (Switzky 2001). For this reason, the present authors were always careful to be patient and warm with all participants in both conditions, to reassure them of the goal of the activity (e.g. 'The task is not a test') and to give them positive feedback all the way through it. Finally, the presence of two individuals (animator and observer) who came to meet participants individually and ask for their opinion probably contrasted with their reality since sadly, isolation and stigmatization are reported to be more frequent amongst individuals with an intellectual disability, compared to other populations (Luftig 1988; Krauss *et al.* 1992; Chou *et al.* 2009).

Although the objective of the experimental manipulation was to manipulate the need for autonomy to isolate its effects from the two other needs (competence and affiliation), it is the fulfilment of the three basic needs that is critical for improving motivation and well-being, according to SDT (Ryan & Deci 2000). The present research does not imply or suggest that the other two needs are not important for people with intellectual disability. Our intention was to focus on autonomy and isolate the effects of autonomy support from support of these two other essential needs.

Surprisingly, the older the participants were, the less their needs for autonomy, relatedness and competence were satisfied during the course of the experiment. This result could be explained by the choice of the task. In fact, the format of the activity resembled to a school task, with instructions and steps to follow which could have been perceived as being too childish and less adapted to older individuals, thus potentially hindering their basic needs. The fact that age was significantly correlated (Table 5) with a lower level of perceived value of the task also supports this interpretation. According to SDT, a task must be developmentally appropriate for the person to satisfy his/her psychological needs (Deci 2004). One of the main challenges of the present study was to select a task that was appropriate for everyone. In fact, the priority was to ensure that no participant felt incompetent while doing it. In contrast, the level of competence in this type of task can vary greatly from one person to the next and the age range of our sample was also quite large. A future study could aim to recruit participants whose ages and capacities are more homogenous, or select a task with gradually more difficult levels, selecting the optimally challenging one for each participant. Future studies could also ensure that the experimental task is not perceived as pleasant

or easy by measuring participants' perceptions in a pilot study.

The fact that participants' gender was related to value they attributed to the task was another surprising result. This gender effect may possibly be explained by the activity chosen. For example, it is recognized that girls value some school activities (i.e. reading) to a greater extent than boys (Eccles, Wigfield, Harold & Blumenfeld, 1993). Given that the activity was somewhat similar to school activities (i.e. reading material, steps and rules to follow), it is possible that female participants perceived more value to it than male participants. Alternatively, it is possible that this activity was more valued by women than men because of its social nature (i.e. social problems, assertiveness).

Limits and future research

To our knowledge, the present study was the first one to evaluate whether autonomy support (AS), as defined by SDT, can promote autonomy, motivational, emotional and behavioural benefits in people with a mild intellectual disability during a learning activity. Although this study integrated knowledge from two large research domains (social/motivational psychology and intellectual deficiency), it is not without limits. First, it was impossible to obtain enough statistical power to detect statistically significant differences in autonomy and task value (sample of approximately 25 participants per group as opposed to the recommended sample size of 64 per group; Cohen 1992). The results of the current study would need to be replicated using larger sample sizes. Future studies could also evaluate potential mediating variables between AS and its effects, on engagement and anxiety for instance.

As autonomy support is defined with four elements, it is impossible to determine how each of them contributed to the benefits found. Future studies could isolate some elements (i.e. choices, rational or empathy) within experimental conditions to measure their specific effect. Moreover, because those four elements were not present in the control condition, there was more language in the AS condition, possibly influencing the present results. For example, speaking at greater length may have helped reduce participants' anxiety because of the time spent with them. On the other hand, longer instructions may also have posed a risk to participants' anxiety, as it represents more verbal information to process. Consequently, it would be advisable to strive to make the instructions' duration equivalent across conditions, in future experiments.

The research assistants responsible of the observational measures were unaware of the goals of the study and did not know in which condition the participants were assigned. However, it is possible that they noticed some differences in the way the activity was conducted. In future studies, to ensure blindness more fully, participants could be filmed, zooming in to exclude the experimenter, and coding could be conducted without sound.

The exclusion criteria of the study also limit the generalization of its findings. In fact, mild intellectual deficiency is often accompanied with other conditions such as those seen in the autism spectrum (Matson & Shoemaker 2009) and those characterized by expressive and receptive communication difficulties (American Association on Intellectual and Developmental Disabilities 2010). Participants who had these difficulties were ineligible for the study because the selected task, although conceived and adapted for people with a mild intellectual disability, had verbal instructions (Deci 2004). Therefore, future research could use a non-verbal task and explore how to adapt elements of AS in order to evaluate its effects on individuals who have severe language and social impairments.

On the other hand, it would have been pertinent to know participants' intelligence quotient (which could vary from 56 to 70) and if they have a comorbid mental health problems, knowing that 20–25% of individuals with a mild intellectual disability also suffer from mental disorders (International Association for the Study of Intellectual Disabilities, 2001). These individual characteristics, which were beyond the scope of this study, could have influenced the target variables, especially the capacity of participants to evaluate the satisfaction of their need for autonomy. In fact, this feeling can be difficult to identify, perhaps particularly when faced with significant cognitive limitations and/or mental health problems that could alter perceptions of social interactions. One study actually demonstrated a positive correlation between the level of intellectual disability and the feeling of self-determination (Wehmeyer & Garner 2003). Future studies could account for these aspects and investigate potentially moderating effects.

Finlay & Lyons' (2002) recommendations were followed, and a pilot study was conducted beforehand (Emond Pelletier *et al.* 2013), the means of the self-reported measures were high (Table 4). This ceiling effect can be explained by the tendency of individuals with an intellectual disability to answer 'yes' (Finlay & Lyons 2002). This phenomenon probably also limited

the possibilities to detect significant differences between both conditions for self-reported variables (autonomy and value) because of the lack of variability. Although Deci (2004) mentioned that SDT's measures could be used as is or could be easily adapted, future studies should take into account this 'yes-saying' tendency and please others when developing questionnaires.

Although the present study measured motivational, behavioural and emotional variables, future research could seek to evaluate the effects of AS on cognitive and performance variables. Studies with normative samples have shown that AS is associated with numerous benefits such as better performance on problem-solving tasks (Boggiano *et al.* 1993), optimal development of executive functions (Bernier *et al.* 2010) and increased memory (Cleveland & Morris 2014). Much like individuals without incapacities, those with a mild intellectual disability are influenced by the social context they live in; and this context can also influence their capacity to use and mobilize their cognitive resources and impact their capacity to learn a new task (Switzky 2001).

Finally, it would be pertinent to ask socialization agents (e.g. parents, educators) who interact and intervene with individuals with a mild intellectual disability how they support their need for autonomy on a daily basis. Researchers have observed the ways teachers (Pilnick *et al.* 2010), care home staff (Finlay *et al.* 2008a) and residential staff (Jingree *et al.* 2006) attempt to foster autonomy, self-determination, choice, control and empowerment when they interact with people who have an intellectual disability, across various situations (transition planning, weighing and residential meeting respectively). For example, Jingree *et al.* (2006) demonstrated that even when the goal of the activity is to promote self-determination, observations of these interactions reveal that it is the opposite that occurs (e.g. residential staff sometimes ignore the participant's perspective or formulate their questions in a way that compels the participant to respond in a certain way). One of the ways these studies contributed to the literature is by documenting how difficult it can be, for socialization agents, to support the autonomy of people with an intellectual disability. More qualitative studies like those are needed. Perhaps future qualitative studies could borrow strategies from the SDT literature (empathy, choice, rational and non-controlling language) and explore other potentially autonomy-supportive strategies (e.g. Côté-Lecaldare *et al.* 2016).

Caouette's (2014) qualitative study explores the ways educators try to foster self-determination in people with

an intellectual disability. It would be interesting to compare and contrast these strategies to the ones proposed in previous studies on AS (Koestner *et al.* 1984; Joussemet *et al.* 2004; Reeve *et al.* 2004; Jang 2008; Jang *et al.* 2010; Savard *et al.* 2013). These educators have great insight into the characteristics of people with a mild intellectual disability and how to convey AS. This would enrich current knowledge and provide concrete and effective examples on how to support the fundamental need for autonomy of individuals with an intellectual disability. For example, if a person with an intellectual disability is unable to understand the rationale or the choice that is offered, other ways to support his/her autonomy could be explored. It would also be important to better understand how socialization agents perceive AS as well as the obstacles they could face when they want to put it into practice. As Deci (2004) stated, it could be difficult to support the autonomy of individuals with an intellectual disability because of their high tendency to self-regulate based on external contingencies (e.g. in order to please or avoid disappointing others, to obtain a reward) as opposed to internal ones (e.g. acting according to one's own interests and needs). According to some authors (Grolnick & Ryan 1990; Deci 2004; Reeve 2009), such a passive and externally oriented style leads socialization agents to employ more controlling strategies, leading to a vicious thwarting self-determination circle.

Furthermore, although one could strongly value self-determination and its support, it could be very challenging to support the autonomy of a person whose judgement and decision making are severely affected by their cognitive limitations (Caouette 2014). Certain disorders associated with an intellectual disability can also influence the type of support that is given. For example, individuals who suffer from Prader–Willi syndrome have an insatiable appetite which puts their health in danger. Hooren *et al.* (2002) stated that their significant others are constantly in conflict between (i) giving the person adequate care to protect her against the negative consequences of her choices (e.g. preventing the person from eating too much) and (ii) supporting her autonomy (i.e. respecting her choices and decisions). In the intellectual disability domain, self-determination support is sometimes confused with 'laissez-faire' or permissive practices (i.e. to let the person choose and decide what she wants; Wehmeyer 2005). Jang *et al.* (2010) have also noticed that AS concept can be misunderstood and confused with a lack of structure (i.e. lack of clear and consistent limits, rules and expectations). However, studies have demonstrated

that in addition to be distinct and orthogonal dimensions, AS and structure are also complementary dimensions. That is, although they correlate positively to one another, each positively predicted a part of the variance in participants' adjustment (Sierens *et al.* 2009; Jang *et al.* 2010). As Jang *et al.* (2010) stated, « it is not structure or autonomy support but structure and autonomy support ». In sum, structure can be offered in a way that (more or less) supports self-determination.

In the case of people with an intellectual disability, providing a clear structure (setting rules and limits) is a necessity, in particular when individuals must be protected from actions or decisions that could harm them because of their lack of judgment or a disease affecting their behaviour (e.g. Prader–Willi syndrome). The characteristics of people with an intellectual disability can therefore push socialization agents to be more controlling when trying to protect them. However, it is possible to provide both structure and AS (Sierens *et al.* 2009; Jang *et al.* 2010). In the present study, expectations (i.e. listen to the instructions, actively participate, ask questions, express ideas, respect the people and environment around you) were communicated from the beginning of the activity (along with AS, in this experimental condition).

As Reeve (2009) mentioned, numerous factors can influence the extent to which these individuals' need for autonomy can be supported or hindered. Considering the characteristics of people who have a mild intellectual disability (e.g. cognitive and adaptive limitations, external motivation style, passivity), it is easy to understand how difficult it could be to support their autonomy. An investigation into the specific characteristics of individuals with special needs could help better identify the obstacles to AS and its development.

Implications

Based on prior knowledge in human motivation (SDT; Deci & Ryan 2000; Ryan & Deci 2000) and on self-determination of individuals with a mild intellectual disability (Wehmeyer 2001; Wehmeyer *et al.* 2009), the present study integrated and contributed to two research domains. The experimental design of the current study enables us to draw causal links between AS and behavioural (increases in engagement) and emotional (decreases in anxiety) benefits with individuals with a mild intellectual disability. Futures studies with larger sample size will be needed to evaluate the impact of AS on perceived autonomy and task's value more fully.

The present findings contribute to the advancement of knowledge by suggesting concrete ways to promote the learning and well-being of individuals with a mild intellectual disability. According to Lachapelle & Wehmeyer (2003), a significant shift must occur in service-providers' perceptions and beliefs to prioritize the autonomy of individuals with an intellectual disability in the interventions that are offered to them. For example, although the use of rewards is advocated in specialized education to achieve behavioural goals, facilitate motivation and learning (Witzel & Mercer 2003), Deci (2004) stressed that their long-term use can have devastating effects on the person's capacity to act autonomously; that is, to self-regulate according to internal cues and points of reference (e.g. unique preferences, interests and values) instead of external ones (e.g. praise, reward).

Finally, the present findings tend to support the hypothesis that the need for autonomy is universal (Deci & Ryan 2000) by demonstrating that people with a mild intellectual disability equally benefit from a relational context where their need for autonomy is supported, despite their cognitive and motivational vulnerabilities. The AS components (Faber & Mazlish 1980, 2005; Koestner *et al.* 1984; Deci *et al.* 1994) that are used can serve as examples for parents, educators and other professionals who aim to provide the necessary structure and support in a way that takes the person's autonomy into account.

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References

- American Association on Intellectual and Developmental Disabilities (2010) *Intellectual Disability: Definition, Classification, and Systems of Supports*, 11th edn. American Association on Intellectual and Developmental Disabilities, Washington, D.C.
- Barber B. K. (1996) Parental psychological control: Revisiting a neglected construct. *Child Development* **67**, 3296–3319.
- Bernier A., Whipple N. & Carlson S. (2010) From external regulation to self-regulation: Early parenting precursors of young children's executive functioning. *Child Development* **81**, 326–339.
- Black A. E. & Deci E. L. (2000) The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: A self-determination theory perspective. *Science Education* **84**, 740–756.
- Boggiano A. K., Flink C., Shields A., Seelbach A. & Baret M. (1993) Use of techniques promoting students' self-determination: Effects on students' analytic problem-solving skills. *Motivation and Emotion* **17**, 319–336.
- Bourque J., Blais J.-G. & Larose F. (2009) L'interprétation des tests d'hypothèses: p, la taille de l'effet et la puissance. *Revue des sciences de l'éducation* **35**, 211–226.
- Caouette M. (2014) Étude descriptive des pratiques d'intervention en CRDITED favorisant l'autodétermination d'adultes présentant une déficience intellectuelle : La perspective des intervenants (Unpublished doctoral dissertation). Université du Québec à Trois-Rivières, Trois-Rivières, Qc.
- Chou Y. C., Schalock R. L., Tzou P. Y., Lin L. C., Chang A. L., Lee W. P. & Chang S. C. (2007) Quality of life of adults with intellectual disabilities who live with families in Taiwan. *Journal of Intellectual Disability Research* **51**, 875–883.
- Chou Y. C., Pu C. Y., Lee Y. C., Lin L. C. & Kröger T. (2009) Effect of perceived stigmatisation on the quality of life among ageing female family carers: a comparison of carers of adults with intellectual disability and carers of adults with mental illness. *Journal of Intellectual Disability Research* **53**, 654–664.
- Cleveland E. S. & Morris A. (2014) Autonomy support and structure enhance children's memory and motivation to reminisce: A Parental training study. *Journal of Cognition and Development* **15**, 1–13.
- Cohen J. (1988) *Statistical Power Analysis for the Behavioral Sciences*. 2e éd. Lawrence Erlbaum Associates, Hillsdale, New Jersey.
- Cohen J. (1992) A power primer. *Psychological Bulletin* **112**, 155–159.
- Côté-Lecaldare M., Joussemet M. & Dufour S. (2016) How to support toddlers' autonomy: A qualitative study with child care educators. *Early Education and Development*. doi: 10.1080/10409289.2016.1148482.
- Deci E. L. (2004) Promoting intrinsic motivation and self-determination in people with mental retardation. In: *International Review of Research in Mental Retardation: Personality and Motivational Systems in Mental Retardation* (ed H. N. Switzky) pp. 1–29. Elsevier Academic Press, San Diego, CA.
- Deci E. L. & Ryan R. M. (2000) The what and why of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry* **11**, 227–268.
- Deci E. L. & Ryan R. M. (2008) Facilitating optimal motivation and psychological well-being across life's domains. *Canadian Psychology/Psychologie canadienne* **49**, 14–23.
- Deci E. L., Hodges R., Pierson L. & Tomassone J. (1992) Autonomy and competence as motivational factors in students with learning disabilities and emotional handicaps. *Journal of Learning Disabilities* **25**, 457–471.
- Deci E. L., Eghrari H., Patrick B. C. & Leone D. (1994) Facilitating internalization: The self-determination theory perspective. *Journal of Personality* **62**, 119–142.
- Eccles J., Wigfield A., Harold R. D. & Blumenfeld P. (1993) Age and gender differences in children's self- and task perceptions during elementary school. *Child development* **64**, 830–847.

- Emond Pelletier J., Brouillard C. & Joussemet M. (2013) Psychometric properties of self-determination questionnaires evaluating individual with mild Intellectual disabilities. Poster session presented at International Conference of Self-Determination Theory, Rochester, NY.
- Faber A. & Mazlish E. (1980) *Parler pour que les enfants écoutent, Écouter pour que les enfants parlent. [How to talk so kids will listen & listen so kids will talk]*. Relations plus Inc, Cap-Pelé, NB.
- Faber A. & Mazlish E. (2005) *How to Talk so Teens Will Listen & Listen so Teens Will Talk*. HarperCollins Publishers Inc, New York.
- Finlay W. M. L. & Lyons E. (2002) Acquiescence in interviews with people who have mental retardation. *Mental Retardation* **40**, 14–29.
- Finlay W. M. L., Antaki C. & Walton C. (2008a) Saying no to the staff: an analysis of refusals in a home for people with severe communication difficulties. *Sociology of Health & Illness* **30**, 55–75.
- Finlay W. M. L., Walton C. & Antaki C. (2008b) Promoting choice and control in residential services for people with learning disabilities. *Disability & Society* **23**, 349–360.
- Forest J. & Mageau G. (2008) Intrinsic need satisfaction as a mediator between harmonious passion and psychological adjustment at work. Manuscript in preparation, Université du Québec à Montréal School of Management Sciences.
- Fox R. M. & Bittle R. G. (1989) *Thinking it Through: Teaching a Problem Solving Strategy for Community Living*. Research Press, Champaign, IL.
- Goodwin J. (2010) *Research in Psychology: Methods and Design*, 6th edn. John Wiley & Sons Inc, Danvers, MA.
- Grolnick W. S. & Ryan R. M. (1990) Self-perceptions, motivation, and adjustment in children with learning disabilities: A multiple group comparison study. *Journal of Learning Disabilities* **23**, 177–184.
- Haccoun R. R. & Cousineau D. (2007) *Statistiques: Concepts et Applications*. Les Presses de l'Université de Montréal, Montréal.
- Hardre P. & Reeve J. (2003) A motivational model of rural students' intentions to persist in, versus drop out of high school. *Journal of Educational Psychology* **95**, 347–356.
- Hooren R. H. V., Widdershoven G. A. M., Borne H. W. V. D. & Curfs L. M. G. (2002) Autonomy and intellectual disability: the case of prevention of obesity in Prader-Willi syndrome. *Journal of Intellectual Disability Research* **46**, 560–568.
- International Association for the Study of Intellectual Disabilities (2001). Mental health and intellectual disabilities: Addressing the mental health needs of people with intellectual disabilities. Available at: <http://iassid.org/pdf/mh-sirg-who-final.pdf> (accessed on 15 March 2014).
- Jang H. (2008) Supporting students' motivation, engagement, and learning during an uninteresting activity. *Journal of Educational Psychology* **100**, 798–811.
- Jang H., Deci E. L. & Reeve J. (2010) Engaging student in learning activities: It is not autonomy support or structure but autonomy support and structure. *Journal of Educational Psychology* **102**, 588–600.
- Jingree T., Finlay W. M. L. & Antaki C. (2006) Empowering words, disempowering actions: an analysis of interactions between staff members and people with learning disabilities in residents' meetings. *Journal of Intellectual Disability Research* **50**, 212–226.
- Joussemet M., Koestner R., Lekes N. & Houliort N. (2004) Introducing uninteresting task to children: A comparison of the effects of rewards and autonomy support. *Journal of Personality* **72**, 139–166.
- Joussemet M., Landry R. & Koestner R. (2008) A self-determination theory perspective on parenting. *Canadian Psychology* **49**, 194–200.
- Joussemet M., Mageau G. & Koestner R. (2014) Promoting optimal parenting and children's mental health: A preliminary evaluation of the how-to parenting program. *Journal of Child and Family Studies* **23**, 949–964.
- Kline R. B. (2004) *Beyond Significance Testing: Reforming Data Analysis Methods in Behavioral Research*. American Psychological Association, Washington, District of Columbia.
- Koestner R., Ryan R., Bernieri F. & Holt K. (1984) Setting limits on children's behavior: The differential effects of controlling vs. informational styles on intrinsic motivation and creativity. *Journal of Personality* **53**, 233–248.
- Krauss M. W., Seltzer M. M. & Goodman S. J. (1992) Social support networks of adults with mental retardation who live at home. *American Journal on Mental Retardation* **96**, 432–441.
- Lachapelle Y. & Wehmeyer M. L. (2003) L'autodétermination. In: *La déficience intellectuelle* (eds M. J. Tassé & D. Morin), pp. 201–214. Gaëtan Morin, Boucherville, QC.
- Lachapelle Y., Wehmeyer M., Haelewyck M. C., Courbois Y., Keith K. D. & Schalock R. (2005). The relationship between quality of life and self-determination: An international study. *Journal of Intellectual Disability Research*, **49**, 740–744.
- Laurent J., Catanzaro S. J., Joiner T. E., Rudolph K. D., Potter K. I., Lambert S. & Gathright T. (1999) A measure of positive and negative affect for children: Scale development and preliminary validation. *Psychological Assessment* **11**, 326–338.
- Luftig R. L. (1988) Assessment of the perceived school loneliness and isolation of mentally retarded and nonretarded students. *American Journal of Mental Retardation* **92**, 472–275.
- Matson J. L. & Shoemaker M. (2009) Intellectual disability and its relationship to autism spectrum disorders. *Research in Developmental Disabilities* **30**, 1107–1114.
- McAuley E., Duncan T. & Tammen V. V. (1989) Psychometric properties of the Intrinsic Motivation Inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport* **60**, 48–58.
- Pilnick A., Clegg J., Murphy E. & Almack K. (2010) Questioning the answer: questioning style, choice and self-determination in interactions with young people with intellectual disabilities. *Sociology of Health & Illness* **32**, 415–436.
- Reeve J. (2009) Why teachers adopt a controlling motivating style towards students and how they can become more autonomy supportive. *Educational Psychologist* **44**, 159–175.

- Reeve J. & Halusic M. (2009) How K-12 teachers can put self-determination theory principles into practice. *Theory and Research in Education* 7, 145–154.
- Reeve J., Jang H., Hardre P. & Omura M. (2002) Providing a rationale in an autonomy-supportive way as a strategy to motivate others during an uninteresting activity. *Motivation and Emotion* 26, 183–207.
- Reeve J., Jang H., Carrell D., Jeon S. & Barch J. (2004) Enhancing students' engagement by increasing teachers' autonomy support. *Motivation and Emotion* 28, 147–169.
- Ryan R. M. & Deci E. L. (2000) Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist* 55, 68–78.
- Ryan R. M., Deci E. L., Grolnick W. S. & La Guardia J. G. (2006) The significance of autonomy and autonomy support in psychological development and psychopathology. In: *Developmental Psychopathology: Theory and Method*, 2nd edn (eds D. Cicchetti & D. J. Cohen) pp. 795–849. Wiley & Sons Inc, New Jersey.
- Savard A., Joussemet M., Emond Pelletier J. & Mageau G. (2013) The benefits of autonomy support for adolescents with severe emotional and behavioral problems. *Motivation and Emotion* 37, 688–700.
- Sierens E., Vansteenkiste M., Goossens L., Soenens B. & Dochy F. (2009) The synergistic relationship of perceived autonomy support and structure in the prediction of self-regulated learning. *British Journal of Educational Psychology* 79, 57–68.
- Soenens B., Vansteenkiste M., Lens W., Luyckx K., Goossens L., Ryan R. M. & Beyers W. (2007) Conceptualizing parental autonomy support: Adolescent perceptions of promotion of independence versus promotion of volitional functioning. *Developmental Psychology* 43, 633–646.
- Stevens J. (1996) *Applied Multivariate Statistics for the Social Sciences*, 3rd edn. Lawrence Erlbaum, Mahwah, NJ.
- Switzky H. N. (2001) Personality and motivational self-system processes in people with mental retardation: Old memories and new perspectives. In: *Personality Motivational Differences in Persons with Mental Retardation* (ed H. N. Switzky) pp. 57–143. Lawrence Erlbaum Associates, Mahwah, NJ.
- Thompson J. R., Bradley E., Buntinx W. H., Schalock R. L., Shogren K. A., Snell M. E. & Wehmeyer M. L. (2009) Conceptualizing supports and the support needs of people with intellectual disability. *Intellectual and Developmental Disabilities*, 47, 135–146. doi:10.1352/1934-9556-47.2.1
- Vallerand R. J. (1989) Vers une méthodologie de validation trans-culturelle de questionnaires psychologiques: Implications pour la recherche en langue française. [Toward a methodology for the transcultural validation of psychological questionnaires: Implications for research in the French language.]. *Canadian Psychology/Psychologie canadienne*, 30, 662–680.
- Vallerand R., Fortier M. S. & Guay F. (1997) Self-determination and persistence in a real-life setting: Toward a motivational model of high school dropout. *Journal of Personality and Social Psychology* 72, 1161–1176.
- Wehmeyer M. (1992) Self-determination and the education of students with mental retardation. *Education and Training in Mental Retardation* 27, 302–314.
- Wehmeyer M. (2001) Self-determination and mental retardation: Assembling the puzzle pieces. In: *Personality and Motivational Differences in Persons with Mental Retardation* (ed H. N. Switzky) pp. 147–198. Lawrence Erlbaum Associates, Mahwah.
- Wehmeyer M. L. (2005) Self-determination and individuals with severe disabilities: Re-examining meanings and misinterpretations. *Research and Practice for Persons with Severe Disabilities*, 30, 113–120 Retrieved from http://www.beachcenter.org/Research/FullArticles/PDF/Wehmeyer_2005.pdf.
- Wehmeyer M. L. (2007a) *Promoting Self-Determination in Students with Developmental Disabilities*. The Guilford Press, New York.
- Wehmeyer M. L. (2007b) Teaching problem solving and decision making. In: *Promoting Self-Determination in Students with Developmental Disabilities* (eds K. R. Harris & S. Graham) pp. 33–48. The Guilford Press, New York.
- Wehmeyer M. L. (2007c) Overview of self-determination and self-determination. In: *Promoting Self-Determination in Students with Developmental Disabilities* (eds Harris KR & Graham S) pp. 3–14. Guilford Press, New York.
- Wehmeyer M. & Bolding N. (2001) Enhanced self-determination of adults with intellectual disability as an outcome of moving to community-based work or living environments. *Journal of Intellectual Disability Research* 45, 371–383.
- Wehmeyer M. & Garner N. (2003) The impact of personal characteristics of people with intellectual and developmental disability on self-determination and autonomous functioning. *Journal of Applied Research in Intellectual Disabilities* 16, 255–265.
- Wehmeyer M. L. & Palmer S. B. (2003) Adult outcomes for students with cognitive disabilities three years after high school: The impact of self-determination. *Education and Training in Developmental Disabilities* 38, 131–144.
- Wehmeyer M. L. & Schalock R. L. (2001) Self-determination and quality of life: Implications for special education services and supports. *Focus on Exceptional Children* 33, 1–16.
- Wehmeyer M. L. & Schwartz M. (1997) Self-determination and positive adult outcomes: A follow-up study of youth with mental retardation or learning disabilities. *Exceptional Children* 6, 245–255.
- Wehmeyer M. L. & Schwartz M. (1998) The relationship between self-determination and quality of life for adults with mental retardation. *Education and Training in Mental Retardation and Developmental Disabilities* 33, 3–12.
- Wehmeyer M., Agran M. & Hugues C. (2000) A national survey of teachers' promotion of self-determination and student directed learning. *Journal of Special Education* 34, 58–68.
- Wehmeyer M., Little T. D. & Sergeant J. (2009) Self-determination. In: *Oxford Handbook of Positive Psychology* (eds

- S. J. Lopez & C. R. Snyder) pp. 541–555. Oxford University Press Inc, New York.
- Witzel B. S. & Mercer C. D. (2003) Using rewards to teach students with disabilities. *Remedial and Special Education* **24**, 88–96.
- Wullick M., Widdershoven G., Schrojenstein Lantman-de Valk H. V., Metsemakers J. & Dinant G. J. (2009) Autonomy in relation to health among people with intellectual disability. *Journal of Intellectual Disability Research*, **53**, 816–826.