Mindfulness and Foreign Language Anxiety in the Bilingual Primary Classroom

Mindfulness y la ansiedad provocada por la lengua extranjera en el aula bilingüe de Primaria

LOUISA MORTIMORE
PROFESORA EN LA UNIVERSIDAD INTERNACIONAL DE LA RIOJA (UNIR)

Abstract

Pilot study of how the use of mindfulness techniques may positively affect foreign language anxiety in bilingual primary classrooms. Data collection used qualitative and quantitative measures: self-reporting questionnaires to measure mindfulness (CAMM) and attitude to L2, language tests to determine the rate of improvement in language learning, and teacher observation. Attention and disturbance was logged in each session. While results are inconclusive, a modest improvement in the L2 was recorded in the test group which had high attention and low disturbance scores.

Key words: mindfulness, foreign language anxiety, primary, education, bilingual.

Resumen

Este estudio piloto examinó si el uso de *mindfulness* afecta de manera positiva la ansiedad provocada por la lengua extranjera en el aula bilingüe de Primaria. Se emplearon instrumentos de medida cualitativos y cuantitativos: cuestionarios para determinar el nivel de mindfulness (CAMM) y actitud hacia la L2, y pruebas lingüísticas para determinar el ritmo de aprendizaje en la lengua aprendida. Los niveles de atención y distracción fueron observados. Mientras que los resultados no son concluyentes, se observó una leve mejoría en la L2, en el grupo de prueba que obtuvo una puntuación alta en atención y baja distracción.

Palabras clave: *mindfulness*, ansiedad provocada por la lengua extranjera, educación, primaria, bilingüe.

ISSN: 1576-5199
Fecha de recepción: 15/03/2017
Fecha de aceptación: 31/03/2017

1. INTRODUCTION

The Primary classroom is frequently the first formal exposure children have of English as a Foreign Language. Each child's perception of this experience, whether positive or negative, helps determine their attitude towards English, or any foreign language. Much research supports that by reducing classroom anxiety and increasing motivation, we can help our pupils learn new language and improve their performance (Krashen, 1982; Horwitz, Horwitz & Cope, 1986; Young, 1991). While this aim may be shared by many teachers, the question remains as to how best it may be achieved, as the factors influencing foreign language learning are complex and varied.

After learning of the potential cognitive benefits of using mindfulness techniques over the last two years, I started to question whether the use of these techniques in the classroom could aid foreign language learning through lowered anxiety, increased attentional skills and emotional awareness. Research on the neuroplastic changes resulting from mindfulness meditation suggests that mindfulness may decrease anxiety (Beauchemin, Hutchins & Patterson, 2008; Semple, Lee, Rosa & Miller, 2010), improve the ability of the mind to focus (Tang, Yang, Leve & Harold, 2012), and have a «conscious» awareness (Siegel, Germer, & Olendzki, 2009; Chaskalson, 2011; Ager, Albrecht & Cohen, 2015), i.e. be aware of what we are thinking. By applying this knowledge to the area of language learning in Primary, we can explore if it can help children develop a more positive attitude to English, lower anxiety and consequently, the affective filter.

Mindfulness, as a secular meditation practice as referred to in this paper, is the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally (Kabat-Zinn, 2003). Some of the acclaimed benefits of mindfulness are disputed and unproven, although potential cognitive changes achieved through meditation practice are currently the subject of growing research[1]. Nevertheless, studies investigating the effects of mindfulness programmes on children are scant (Kuyken et al. 2013; Lawlor, Schonert-Reichl, Gader-mann & Zumbo, 2014), and when delivered by school teachers in class, even scarcer (Vickery & Dorjee, 2015). To my knowledge, there are no studies on the effects of mindfulness programmes on foreign language learning

1 Article was published in 1981, compared to 674 in 2015 (AMR Association, 2017).

in Primary schoolchildren. This study asks the following questions regarding the use of mindfulness techniques in the bilingual Primary classroom:

1. Does mindfulness, by increasing attention, aid language learning?
2. Does mindfulness, by increasing emotional awareness and self-regulation, lower anxiety in the language classroom?
3. Does mindfulness lower the affective barrier, making the mind more «permeable» to new L2 language?

As prerequisites for addressing these questions, I posit one hypothesis: the use of mindfulness techniques will have a positive impact on foreign language learning in the primary classroom.

2. Literature review

2.1. Foreign language classroom anxiety and the affective filter

There is a growing recognition of the need to develop the social and emotional welfare of school children, beyond the achievement of academic skills. Within Spain, the Law of Education[2] in 2013 (henceforth LOMCE), states that teachers and schools have the responsibility to foster personal growth and social integration. The education our students receive as children and adolescents greatly influences their aims and expectations throughout their personal and professional life (LOMCE, 2013, Article 12886, pp. 97858-97859). Furthermore, Clément, Dörnyei & Noels (1994) point out that the learning environment, combined with the learner's affective state and attitude, are interdependent aspects of classroom reality. Combined, they play a determining role on the depth and effectiveness of the learning process.

Nevertheless, despite recognition of the critical role the learning environment plays in the learning process, children in primary education often have no choice over the factors that control their education. They rarely decide which school they attend, their teachers, their peers, the foreign languages

2 *Ley Orgánica para la Mejora de la Calidad Educativa,* 2013.

they are taught, the teaching methods or materials used by the teacher. They are, effectively, rendered powerless within their learning environment.

Furthermore, children in immersion or bilingual education are often encouraged to use only the L2 (or L3) in class. Learning to communicate and express ourselves in a language we have not mastered can be an intensely personal and unsettling experience. Many learners have a strong sense of self-consciousness of making mistakes which demonstrate their lack of ability. Our ability to vocalise our thoughts and feelings is intimately linked to our sense of identity. Being *limited* to expressing ourselves less fully in another language can be frustrating and disturbing, with unnecessary levels of anxiety resulting in unpleasant emotions and stress (Young, 1991). Horwitz, Horwitz & Cope (1986) point out that a negative affective state can create feelings of apprehension, worry, even dread: learners have difficulty concentrating, become forgetful, sweat, and have palpitations, exhibiting avoidance behaviour such as missing class and postponing homework.

As Horwitz, Horwitz & Cope (1986) suggest, the effects of foreign language classroom anxiety on learning can be crippling, severely limiting the ability to learn; affecting both acquisition of new knowledge and performance of existing knowledge. Foreign language anxiety can cause what we commonly refer to as «being blocked»: you know the answer, but are unable to access the information. This can be self-perpetuating- one becomes nervous, blocks and performs badly, and so is more nervous for the next attempt; thus, increasing the likelihood of poor performance, which in turn further increases anxiety.

Consequently, foreign language anxiety can lead to negative cognitive and affective development in relation to the foreign language. When a learner is anxious, or feels unconfident about their ability, the learner acquires less of the language directed at them, as less input is «allowed in» (Krashen, 1981, p. 22). As Krashen states, «Anxiety level may thus be a very potent influence on the affective filter» (1982, p. 31).

If, as frequently occurs, the circumstances where learning is taking place cannot be controlled (i.e. teacher attitude, peer pressure), developing the social and emotional resiliency of schoolchildren may strengthen their ability to cope in adverse situations. Addressing the affective state of our pupils, creating a positive and supportive atmosphere, can promote self-confidence and learning (Young 1991; Clément et al., 1994).

Stevick (1976) posited that a personality change or a positive affective situation could weaken the filter temporarily or permanently (as stated by Azabdaftari, 2010, p. 203). This could potentially be achieved through developing the child's social and emotional skills with a mindfulness in-school programme. Providing our pupils with emotional resources and developing their metacognition (i.e. learning to learn) are powerful tools that enable the children to become responsible for their own learning. An awareness of one's thoughts, as taught in mindfulness, can be a step in this direction.

> In the context of mindfulness, metacognition extends into the domains of feelings and body sensations. The thoughts, feelings and body sensations are experienced in the mind, and metacognition is the mind aware that it is thinking, that it is feeling, that it is sensing. (Chaskalson, 2011, p. 13).

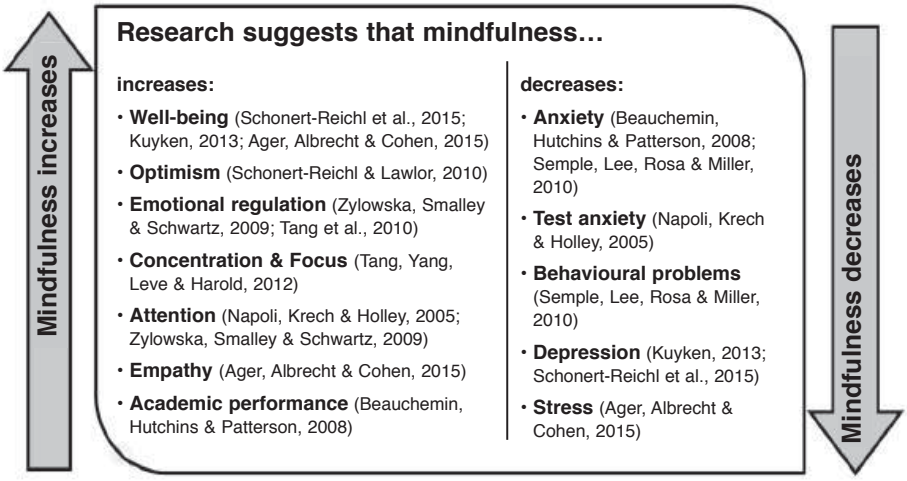
The increased awareness of the senses involves the bottom-up, rather than top-down, functions of the mind (Burnett, 2013). Mindfulness, through emphasising the use of the senses- the visual forms, sounds, smells, tastes, and bodily sensations, steers attention away from the many «upper level» schemas, narratives, beliefs, and other conceptual maps we normally use to guide our way through a day's experience (Siegel et al., 2009, p. 23). Mindfulness aims to teach us how to enter a more nourishing frame of mind by reducing distractive and ruminative thoughts.

2.2. Building resources: effects of mindfulness meditation and neuroplasticity

Understanding the processes through which each of us, as individuals, can choose to influence our own mind and brain, in such a way that we are able to create lasting cognitive change, can be deeply motivating. The Hebbian theory states that neurons that fire together, wire together (Hebb, 1949). Consciously and repeatedly cultivating a state of mind, *hard-wires* the state into the brain's circuitry, to become a trait. This occurs through repeated neural circuit activation which strengthens the synaptic connections associated with those states that then leads to synaptic strengthening and synaptic growth (Siegel, 2007).

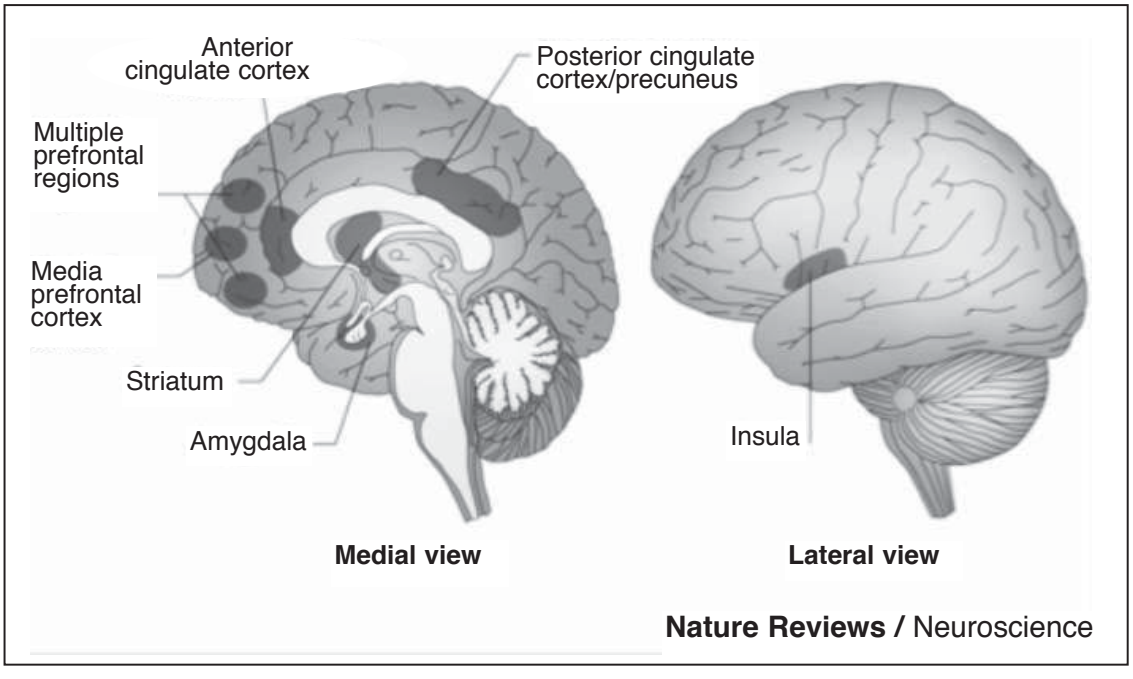
Functional neuroplasticity is the process in which brain structure and function develop and change in response to our experiences in life. In its therapeutic forms, mindfulness interventions may promote both positive states and increased tolerance of negative affect (Figure 1).

Figure 1. Possible changes promoted by mindfulness meditation.
Source: compiled by Author.



While meditation research is still in its infancy (Tang, Hölzel & Posner, 2015), evidence suggests that neuroplastic change is visible in functional magnetic resonance imaging (fMRI) after an 8- week mindfulness course (e.g. Hölzel, 2011a), with neuroplastic changes in the anterior cingulate cortex, insula, temporo-parietal junction, fronto-limbic network, and default mode network structures (Hölzel et al., 2011b).

Figure 2. Areas of the brain affected by mindfulness meditation.
Source: Tang, Hölzel & Posner (2015, p. 5).



The pre-frontal cortex (henceforth PFC), just behind the brow, is most developed in humans. It is responsible for regulation of emotion, self-control, focus, attention, concentration, decision-making, and moderating social behaviour. Research shows that mindfulness meditation activates the PFC, thickening the prefrontal cortical region (Lazar et al., 2005). This leads to improved executive functions and ability to self-regulate emotion (Zylowska, Smalley & Schwartz, 2009), improved attentional control (Napoli, Krech & Holley, 2005), and focus (Tang et al., 2012).

The right anterior insula is believed to be involved in emotional and sensory awareness (Craig, 2003). Mindfulness mediators generally show an increased engagement of the insula (Zeidan et al., 2014), and an increase in grey matter (Lazar et al., 2005).

The limbic system (including the hippocampus, amygdala, and hypothalamus) deals with emotion and memories. MRI scans before and after completing an 8-week Mindfulness Based Stress Reduction (MBSR) course show significant cognitive change in this area: the left hippocampus, which assists long-term memory and emotional responses, such as compassion, was enlarged, and the amygdala, responsible for flight or fight response, reduced in size (Hölzel et al., 2011b). Lowered activity in the amygdala (Desbordes et al., 2012), and less grey matter (Hölzel et al., 2010) suggest there is a biological reason why meditators are thought to experience less reactivity to negative affective states. Futhermore, the hypothalamus plays a pivotal role in triggering the stress response, which mindfulness is believed to reduce (Hoge et al., 2017).

While these results are encouraging, the majority of neuroplastic research is based on interventions with adults. Studies with children are less frequent. This is possibly due to the situational complexity of MRI scans in children which often require sedation (Bie et al., 2010), and the difficulty in determining that neuroplastic change is a result of an intervention, and not due to the already considerable levels of neuroplasticity experienced in childhood and adolescence (Siegel, 2014). It is therefore unclear if mindfulness causes the *same* cognitive changes in children as adults.

Many interventions involving children rely on self-reporting, teacher observation, academic test results, and diverse mindfulness scales to triangulate data. Using such methods, Schonert-Reichl et al. (2015) reported (a)

improved cognitive control and stress physiology; (b) greater empathy, perspective-taking, emotional control, optimism, and mindfulness, (c) greater decreases in self-reported symptoms of depression and peer-rated aggression, (d) increased prosocial behaviour, and (e) increased peer acceptance in 9 to 11-year-olds.

Further studies suggest that mindfulness in school children may result in reduced depression (Kuyken, 2013), reduced stress (Ager et al., 2015), decreased anxiety (Beauchemin et al., 2008), less behavioural problems (Semple et al., 2010), and decreased test anxiety (Napoli, et al., 2005).

Other studies reported improved overall mental health in school children (Joyce, Etty-Leal, Zazryn & Hamilton, 2010), increased well-being (Kuyken, 2013; Ager et al., 2015), optimism (Schonert-Reichl & Lawlor, 2010) selective attention (Napoli et al., 2005), empathy and awareness of self and others (Ager et al., 2015). In addition, adolescents with learning disabilities showed reduced anxiety and improved academic performance (Beauchemin et al., 2008), while Zylowska et al., (2009) reported that the increased capacity for attention and self-regulation through mindfulness meditation may help treat ADHD in adolescents.

3. METHODOLOGY

3.1. Context and Participants

The setting is an all-girls private bilingual Catholic school in North-east Madrid. The study included both classes from 2nd and both from 3rd Year Primary. One class from each year was used as control (control groups year 2 and 3), and test groups (test groups year 2 and year 3). Despite the intention of choosing classes aleatorily, after consulting the school's educational psychologist and teachers, all expressed interest in a particular 3rd year class partaking as certain pupils had learning difficulties (Table 1[3]).

3 The difference in class size has statistical significance, and may affect test results. See section 4.5.

Table 1. Number of children in each class and sample size.
Source: Author.

Year	Class	Group	Number of children in each class	Children with learning difficulties	Data excluded through absence	Sample size
2nd	A	Control	26	3	3	23
	B	Test	23	1	1	22
3rd	A	Test	20	5	2	18
	B	Control	21	1	2	19

3.2. Data collection with pupils

The intervention took place over nine weeks. A combination of both quantitative and qualitative methods were used to triangulate data collection pre, mid and post intervention. Two self-reporting questionnaires were used pre- and post-test to determine the pupils' attitude to English, and measure their level of mindfulness. Pre-and post-test language test scores determined the language level. The level of attention and disturbance of the pupils during the sessions was observed and recorded to enable subsequent evaluation.

A specifically designed questionnaire assessed attitude to English, the teacher and school, identifying the pupil's level of 1) anxiety (nerves, stress when speaking, or being spoken to in L2), 2) focus and concentration (mind wandering, lack of focus, inability to concentrate), 3) motivation (enjoyment, interest, boredom), and iv) state of mind. There were twenty questions using simplified language and emoticons to maximise comprehension.

The second questionnaire was the Child and Adolescent Mindfulness Measure (CAMM) (Greco, Baer & Smith, 2011, p. 612) consisting of ten questions. The CAMM was designed for children and adolescents over the age of nine. I was unable to locate a scale designed and trialled on children younger than nine.

The pre-test language test took place at the end of the first term and was based on language and content taught in class during that term. The post-test was based on language seen the following term, during the intervention. The tests were not written specifically for this study. Both tests were based on Cambridge YLE tests (UCLES, 2017): Year 2 sat a test based on Cambridge

YLE Starters, and year 3, Cambridge YLE Movers. In both cases, the test consisted of Reading and Writing, Listening, and Speaking. By using language tests based on the class content and language taught during the intervention, we are testing their ability to learn and retain that content and language, and whether the intervention has improved their foreign language learning.

3.3. Data collection with teachers

The pre-test teacher questionnaires had dichotomous and nominal questions to categorise, qualitative data in the form of open-ended questions, and quantitative with multiple variables to determine teacher's attitude and openness to mindfulness techniques and expectations for the study.

Post-test, the teacher for test group 2 was interviewed using open-ended questions, and asked their opinion on the acceptability of the intervention, and viability of continuing the programme in the long-term. The teacher for year 3 test group was unavailable for interview.

3.4. Procedure

Specific meditation scripts were designed with appropriate A1-2 language level. Sessions took place four times a week with a short guided-meditation for 5-10 minutes on either mindful listening, observation of the breath, body scan, or loving kindness, and followed with teacher-led class discussion.

If the children were having difficulty paying attention and/or being disruptive the session was shortened, to avoid creating negative associations between learning to meditate (a highly cognitively demanding task that takes time and patience to master) and their behaviour. For meditation to be successful, one must be a willing and attentive participant. To minimise disruption, the children stayed at their desks, adopting a calm posture, straight back, feet on floor. This position was most effective in the morning. Alternatively, if tired, they rested their heads on their desk.

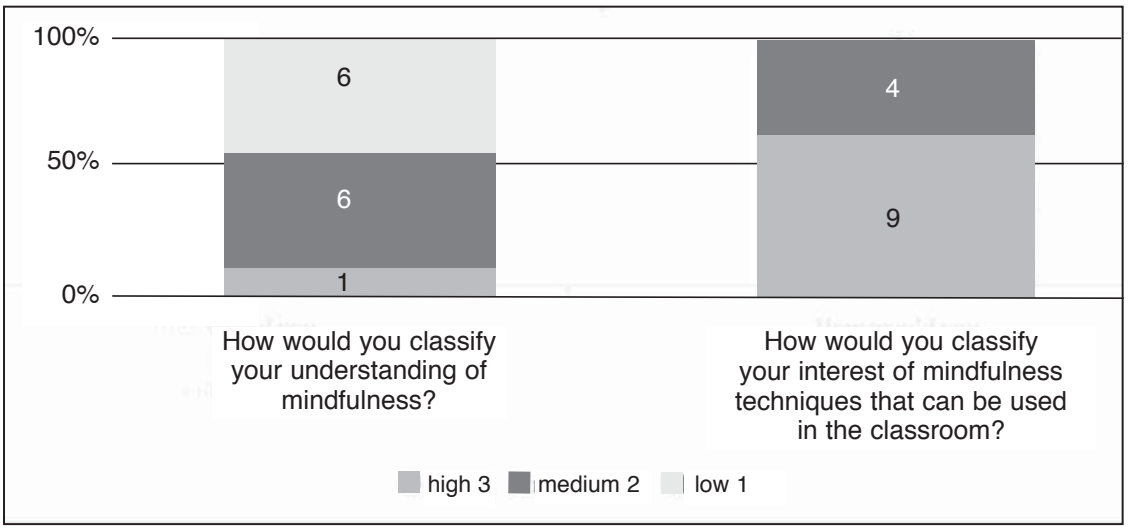
4. Findings and discussion

4.1. Teacher pre-test questionnaires

The aim was to assess the prevailing attitude to mindfulness techniques among teachers, as overtly negative or positive attitudes could affect the

attitude and openness of the pupils. Of the 13 teachers interviewed, 9 expressed interest (Figure 3), with 6 responding that they only possessed low knowledge.

Figure 3. Teachers' understanding and interest in mindfulness techniques.
Source: Author.



The teachers' comments also suggest a positive attitude to mindfulness (Table 2 for sample answers), which may have helped create a more favourable atmosphere for the intervention.

Table 2. Teachers' expectations of the mindfulness sessions.
Source: Author.

What expectations, if any, do you have about the use of mindfulness techniques in your classes?
Improving attention span.
I don't know anything. I am sure my interest would improve while I learn.
Focus, reflection.
Learn different techniques to help pupils improve self-knowledge, self-esteem, self-control, breathing, concentration, etc.

Out of the 13 teachers, seven reported meditating regularly, and an eighth practiced both mediation and yoga regularly (Table 3). Due to the school being Catholic Opus Dei, one may not expect the number to be so high. While secular in nature, mindfulness is oftentimes associated with Buddhism, and many of the meditation practices have their roots in Buddhism. In retrospect, this positive attitude of the teacher staff could possibly be one of the reasons why my proposal to introduce mindfulness for the children was received so warmly.

Table 3. Teacher practices.
Source: Author.

On a regular basis, do you practice	Teachers
Yoga	2
Mindfulness	0
Meditation	7
Yoga and meditation	1

4.2. Teacher observation and evaluation of sessions

From the first day, the experience of instructing each of the two classes was very different, and so I decided to log each session. Although it is hard to accurately reflect the reality experienced by each child, I attempted to record my perception of the general level of attention versus disturbance. This may be an indication of the relative «success» of each session, and the general trend may indicate how well the class responded to the sessions overall. I allotted a score between 0-5 for both my perception of the attention they were paying (0 least attention, 5 most attention- a *higher* score being desirable), and 0-5 for disturbance, (0 least disturbance, 5 most disturbance- a *lower* score being desirable). These are not mutually exclusive, as a small group of children can cause considerable disturbance while another group are trying hard to pay attention. The mindfulness sessions were evaluated over 30 sessions for test group 1, and 31 for test group 2, and the average score calculated (Figures 4 & 5).

I came out of some sessions believing they had been successful, the children had responded, and benefitted. At other times, I felt frustrated at the level of disturbance, with some pupils either giggling, fidgeting, or ignoring me. This was especially true in test group 3. I therefore came to appreciate the complexity of the task. Sitting still and concentrating on one's breath, straight from the playground, is not easy. This was compounded in the children who were most emotionally immature, or with attention deficit disorder, hyperactivity, or a diagnosed reduced capacity in executive functions. Equally, these were the children I felt could potentially most benefit from the sessions.

Figure 4. Levels of *attention* during mindfulness sessions.
Source: Author.

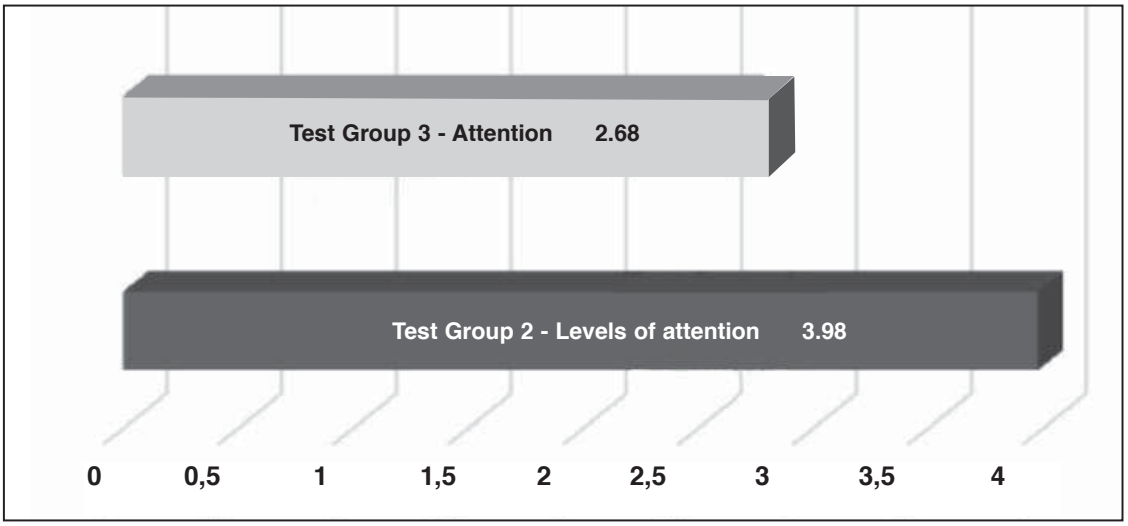
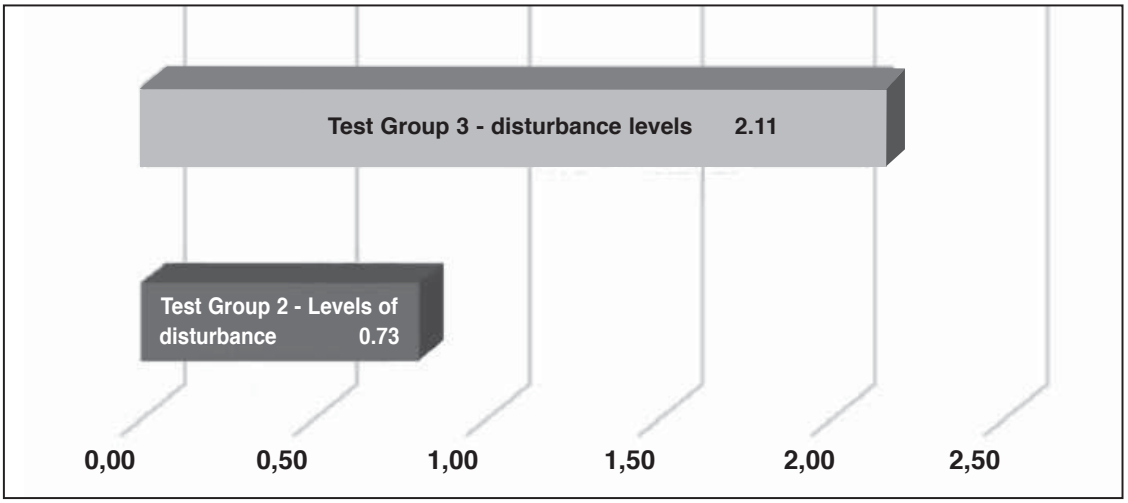


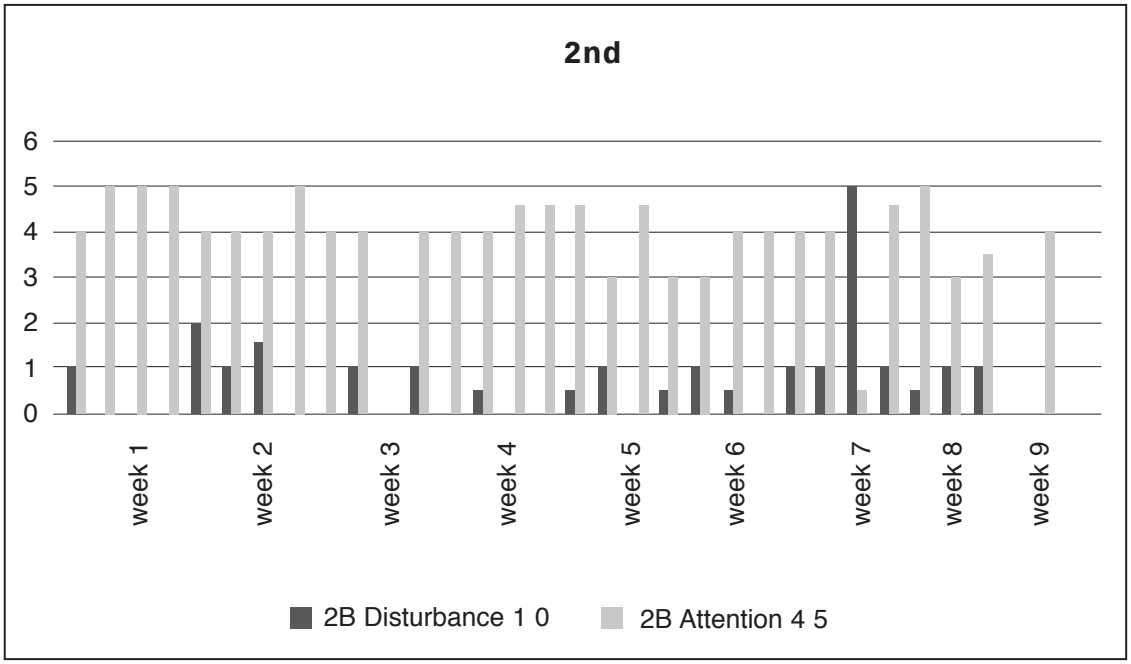
Figure 5. Levels of *disturbance* during mindfulness sessions.
Source: Author.



As can clearly be seen from Figures 4 & 5, test group 2 had better average scores in both attention and disturbance levels taken over the 9 weeks. This suggests that as a group they were more attentive and less disruptive. I believe this could considerably impact the overall results of the research, and could partly explain the disparity between the pre- and post-test language scores of test and control group in their respective years (Figures 13 & 14).

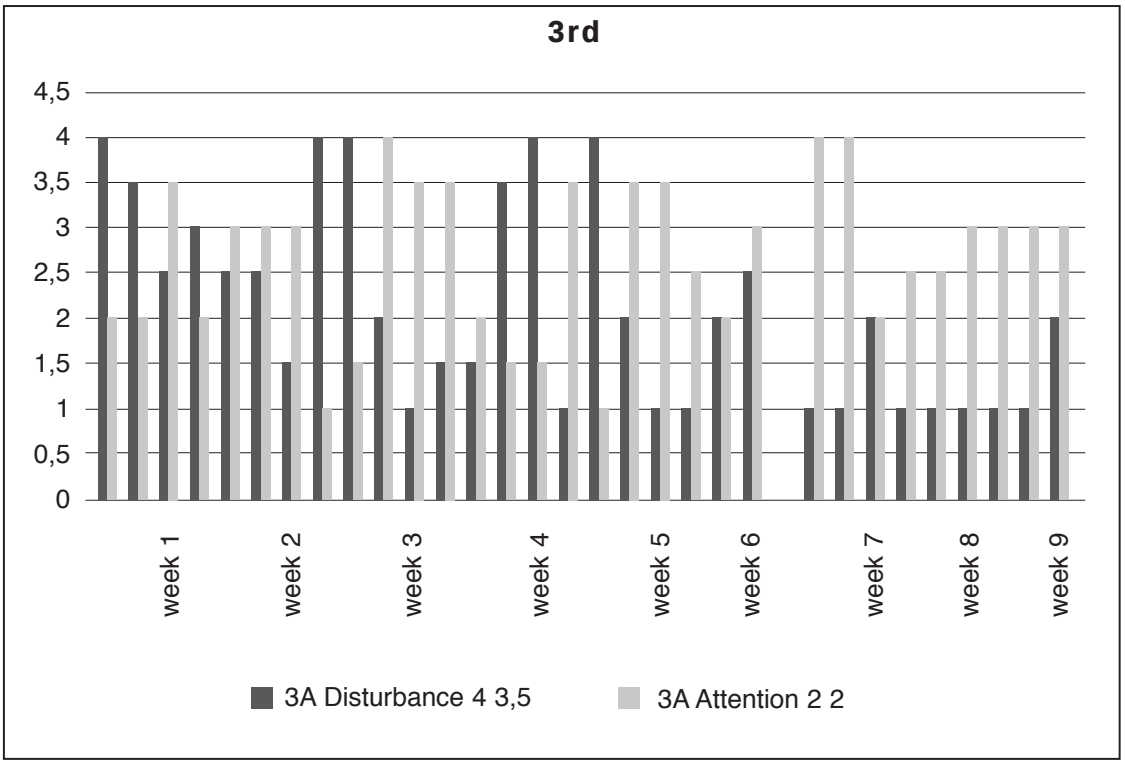
In Figures 6 & 7 we can see the evolution of these sessions over the nine-week period. Test group 2, except for one session in week 7, scored below 2 in disturbance every day. The scores for both attention and disturbance remained relatively stable throughout. This suggests that the class pre-test was already more attentive and less disruptive.

Figure 6. Evolution of mindfulness sessions in test group 2.
Source: Author.



In test group 3 (Figure 7), it was immediately clear that, initially, there was more disturbance than test group 2. They started to settle around week 5. If the study had been of a longer duration, it is possible that the levels of disturbance would have remained at this lower level, or even continued to dissipate further, allowing the sessions to continue undisturbed for the rest of the class. It suggests that if the study had been of a longer duration the mindfulness techniques may have been more effective with more evident results.

Figure 7. Evolution of mindfulness sessions in test group 3.
Source: Author.



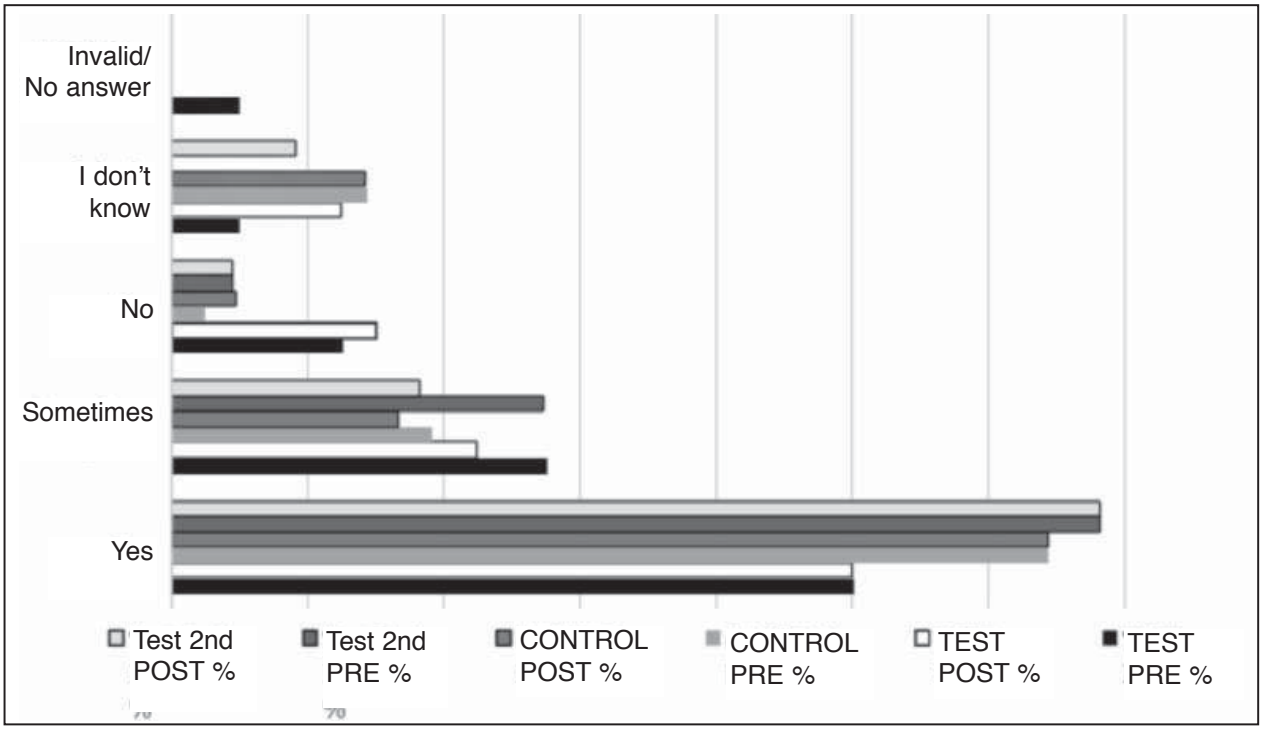
4.3. Results from pupils' questionnaire measuring the pupil's attitude to English

Based on the attention versus disturbance findings (Figures 4 & 5), and working on the hypothesis that for the beneficial effects of mindfulness to be experienced, one must be paying attention, we could further hypothesise that, potentially, the effects, if any, experienced by test group 2, would be consequently higher than test group 3. The results of test group 2, along with both test groups, and both control groups, have been included to determine if the findings become clearer.

4.3.1. Responses to question: «I am Good at English»

Test group 2 had identical scores of 68.2% for both pre- and post-test (Figure 8), suggesting a largely positive attitude to English in the long-term. Their subjective perception of the ability in English seems not to have changed.

Figure 8. Responses to question «I am good at English».
Source: Author.

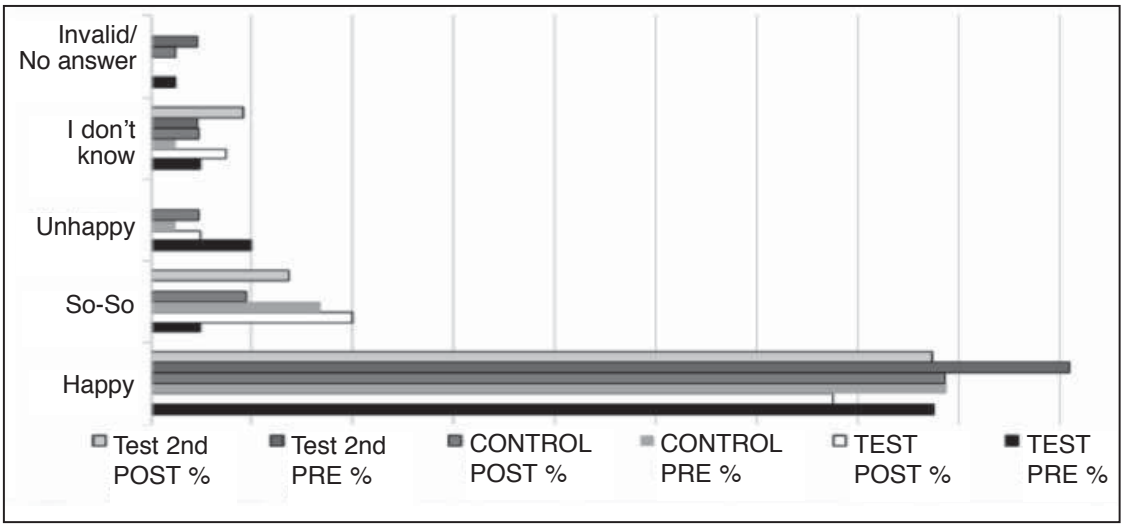


4.3.2. Responses to question: «When I speak English, I feel ...»

The control groups show the same results pre- and post-test (78.6%). Both test groups, however, have decreased by 10%, from 77.5% pre-test, to 67.5% post-test (Figure 9), with test group 2 decreasing 13.6%. Three children out of 22 responded «so-so» post-test, who had previously responded «happy», suggesting that mindfulness has not increased the happiness with English, and may have even negatively affected their perception. This may require individual interviews to try and determine the reasons. My subjective perception of the class is that most children, overall, are relatively at ease when speaking English, insofar that their levels allows/limits their ability to express themselves.

I believe that two possible explanations for these results are: 1) the effect of introducing such a new technique to the children could be temporarily unsettling, as it takes time to feel comfortable, and 2) children are often told to «calm down» when they are upset or over excited. While I did my best to transmit calm, and to associate calmness with a positive state of mind, it is possible that the notion of being encouraged to calm down may have negative connotations and associations with punishment.

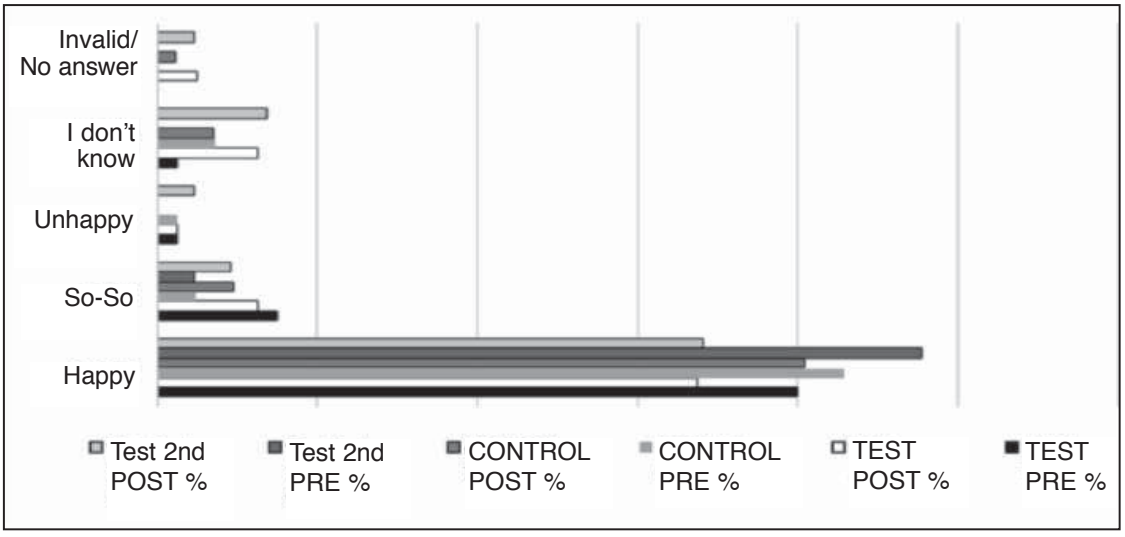
Figure 9. Responses to question «When I speak English, I feel...».
Source: Author.



4.3.3. Responses to question: «When my teacher speaks English to me, I feel...»

All groups have decreased in percentages of respondents answering «happy», respective pre- to post-test (Figure 10). This may be a general tendency, but would require individual interviews to determine the cause. The class teacher for test group 2 suggested that pupils across the school were more restless in the third term, towards the end of the school year, due to tiredness and increased stress levels. This may reflect a decreased perception of well-being.

Figure 10. Responses to question «When my teacher speaks to me in English, I feel...».
Source: Author.

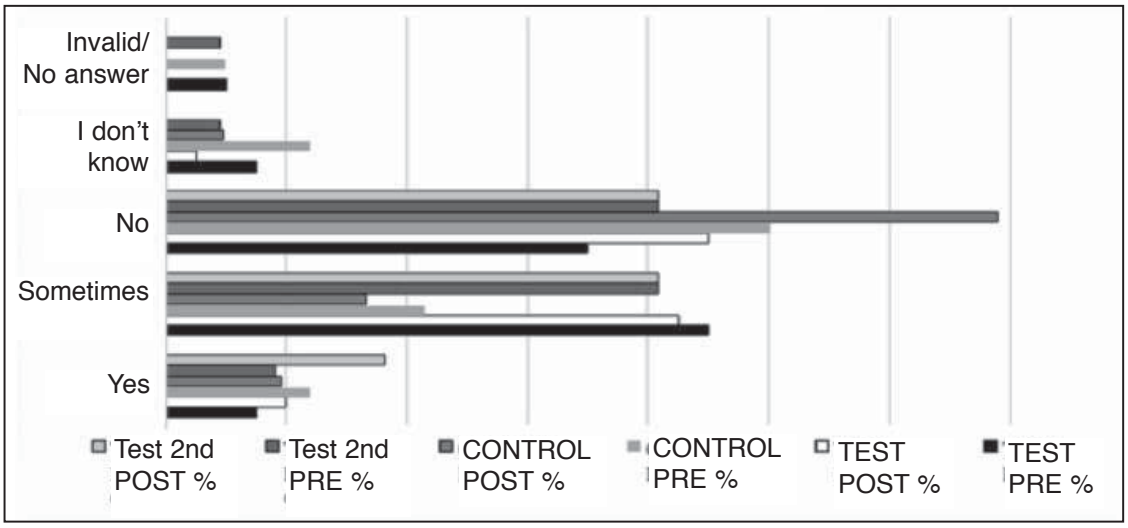


4.3.4. Responses to question: «In class, I think of other things»

69% of the control groups post-test responded that they do NOT think of other things in class. As a teacher of those classes, I can attest to the fact that those same groups are very often noisy, lively and easily distracted. The fact that they respond that they are not easily distracted suggests that they are unaware of just how easily distracted they are, i.e. it is possibly a reflection of their unawareness of how frequently their mind wanders. This may be more common in a person that is not trained in mindfulness. This is referred to as «stimulus-independent thought», and is normal in the human mind, appearing to be the default mode of operation (Killingsworth & Gilbert 2010).

In contrast, mindfulness meditation trains the meditator to recognise when the mind has wandered, and calmly and non-judgmentally bring it back to the present moment. It is likely that a beginner's mind will wander frequently (every few seconds), but that very awareness that your mind has wandered, helps train the mind to wander less frequently. I believe that a person with some limited mindfulness training may have an increased awareness of the frequency with which their mind wanders, but has yet to develop the skills to train the mind to wander less. Furthermore, there is some evidence to suggest that a wandering mind is an unhappy mind (Killingsworth & Gilbert 2010). Test group 2 has the most «yes» responses, with an increase from 9.1 pre-test to 18.2% post-test, an increase of 100%. In real terms, this represented four children's responses instead of 2.

Figure 11. Responses to question «In class, I think of other things».
Source: Author.



With these questions analysed, we can see mixed results. There is limited evidence suggesting that mindfulness may have increased awareness of mind wandering. Other areas appear unchanged such as their perception as to whether they are good at English. One possible area for concern is how the child feels when their teacher speaks to them in English.

Overall, I believe the attitude to English questionnaire was inconclusive as to whether mindfulness helps reduce the affective filter. The results may also reflect that children need time to get used to the procedure, which can be unsettling, and a longer intervention may be needed for more evident results.

4.4. Results from CAMM scale

Some children reported difficulty in completing the CAMM due to not understanding, or not knowing how to apply the questions. This was not due to a language barrier, as the questions were also included in Spanish. One child in test group 3 said, «yes, I understand, but I don't know», to CAMM question number 3: «I keep myself busy, so I don't notice my thoughts or feelings,». Another observed that the questionnaire was «very *raro*». These comments reflect that the questions require a certain maturity and capacity for self-reflection, and involve previously unconsidered concepts.

As a result, many children left answers blank on the CAMM questionnaire. In the CAMM scale, when an answer is blank, the sample is invalid, as the mindfulness measure is calculated on the overall score obtained. This resulted in a considerable number of invalid samples which were excluded from the analysis (Table 4). To retain sufficient samples to obtain data, I did not further exclude those samples where either the pre-test or post-test sample had been invalid.

Table 4. Blank answers in CAMM, resulting in samples being excluded.
Source: Author.

Groups	Number of samples excluded due to a blank answer in CAMM
Both test groups pre-intervention	13
Both test groups post-intervention	14
Both control groups pre-intervention	4
Both control groups post-intervention	4
Test group 2 pre-intervention ONLY	6
Test group 2 post-intervention ONLY	10

The test groups, mostly test group 2, saw a high level of blank answers. Many children were concerned (and upset) if they could not understand the concepts they were making such an effort to understand, and did not want to put an untrue answer about their feelings. Faced with the consternation of the children, this resulted in the teachers telling them to leave it blank if they really did not know what to put, and not to worry further.

It is possible that this increased awareness results from the mindfulness practice, as each session started with identifying how we feel, and discussing our emotions, and they wanted to understand the concepts about mindfulness in a questionnaire that I had asked them to fill in for me. I believe this was a result of their increased empathy towards me, as in part, they now perceived me as a person with feelings, rather than «just a teacher». We had discussed our emotions, feelings, empathy, friendship, etc., on almost a daily basis. An example is one girl who offered to share her emotions with the class, and said she was feeling sad. I asked if she knew why, to which she replied that she did. I then asked if she would like to speak privately to me after the session. Together we discussed her problem (a falling out with a classmate in the playground), and I asked if she would like to do some breathing exercises, before re-joining the class. The following day, as I entered they classroom, she came up to me and hugged me for quite some time, and kept coming up to hold my hand. Two months earlier, this girl would overtly shrug off any physical contact with me.

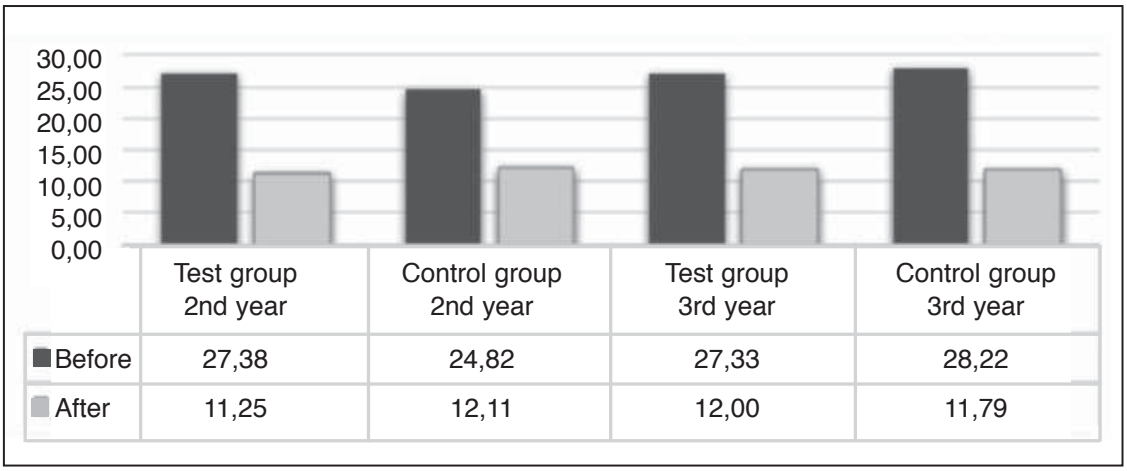
In contrast, I did not achieve the same rapport with test group 3 (possibly because of the lower attention and greater disruption), or the control groups. These groups also knew the questionnaire was for me, but did not leave as many blank answers. This suggests that either a) they did not experience as much difficulty, or b) did not analyse their answers as fully. Possibly, a greater rate of completion does not necessarily equate with a greater understanding and ability to discern their emotions, but rather a lower awareness of one's emotional state. It is an area I would need to improve for any future study.

The CAMM questionnaire was designed for older children, and self-reporting on mindfulness skills is difficult for young children, and the results, therefore, may not be accurate (R. Baer, personal communication, January 26, 2017). The results were frequently polarized within the same person's answers. i.e. some children tended to use absolutes (*never* or *always*), ans-

wering the ten questions with 8 «nevers» and 2 «always». This, I speculate, results from emotional immaturity, and subsequent lack of accuracy in self-reporting-ignoring more subtle responses.

One of the most striking aspects of the results of the CAMM questionnaire is the high pre-test score and the much lower post-test score (Figure 12). These results were consistent across all four control and test groups, with approximately half the post-test score to the pre-test score. I do not believe that the difficulty of the concepts can be the only factor as it does not explain why the scores were so different pre-to post-test, and consistent across the all groups.

Figure 12. Average pre- and post-intervention CAMM scores (the lower the score, the more mindful).
Source: Author.



	Test group 2nd year	Control group 2nd year	Test group 3rd year	Control group 3rd year
Before	27,38	24,82	27,33	28,22
After	11,25	12,11	12,00	11,79

It may partly be due to the fact that, during the intervention, much of the department became interested in the use of mindfulness techniques and started using mindfulness audios and breathing exercises downloaded from internet in their classes, including the control groups. At the same time, the department started to apply Social and Emotional Learning techniques in all the classes. This has possibly affected the clarity of the results, as potential differences may have been masked between the control and test groups.

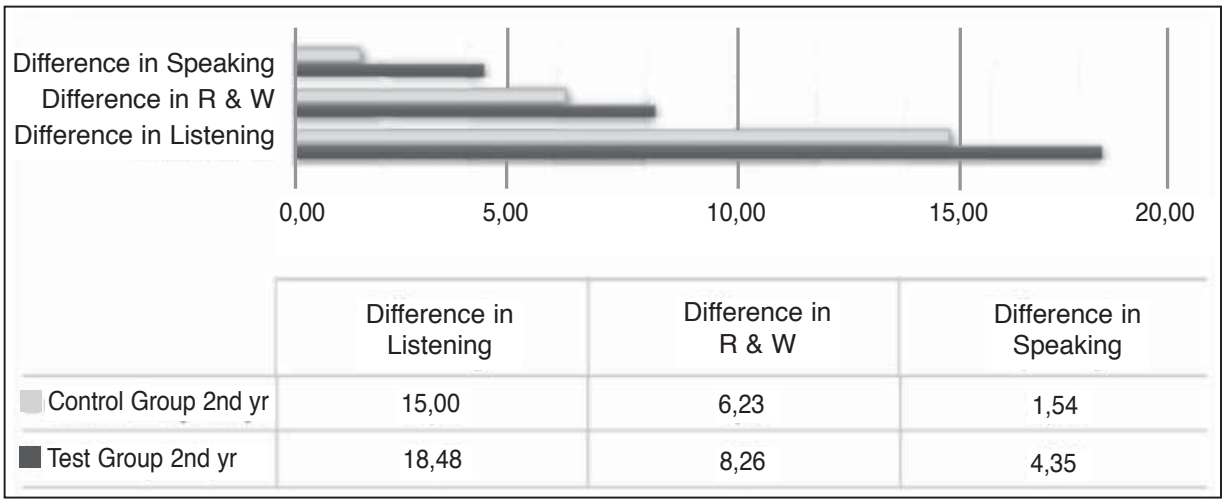
Overall, I believe the CAMM results are inconclusive as to whether they indicate increased mindfulness in the test groups. This is particularly relevant as we cannot accurately determine whether increased mindfulness is responsible for any of the changes that may be noted in the study.

4.5. Results from language tests

The language test scores are a comparison between pre-and post-intervention testing, rather than the actual scores (Figures 13 & 14). This was necessary to determine the improvement in test scores from pre- to post-test, not the overall language level of each class.

The language test scores vary considerably between test and control groups 2, and test and control groups 3. Test group 2's score improved significantly over and above control group 2 in all skills.

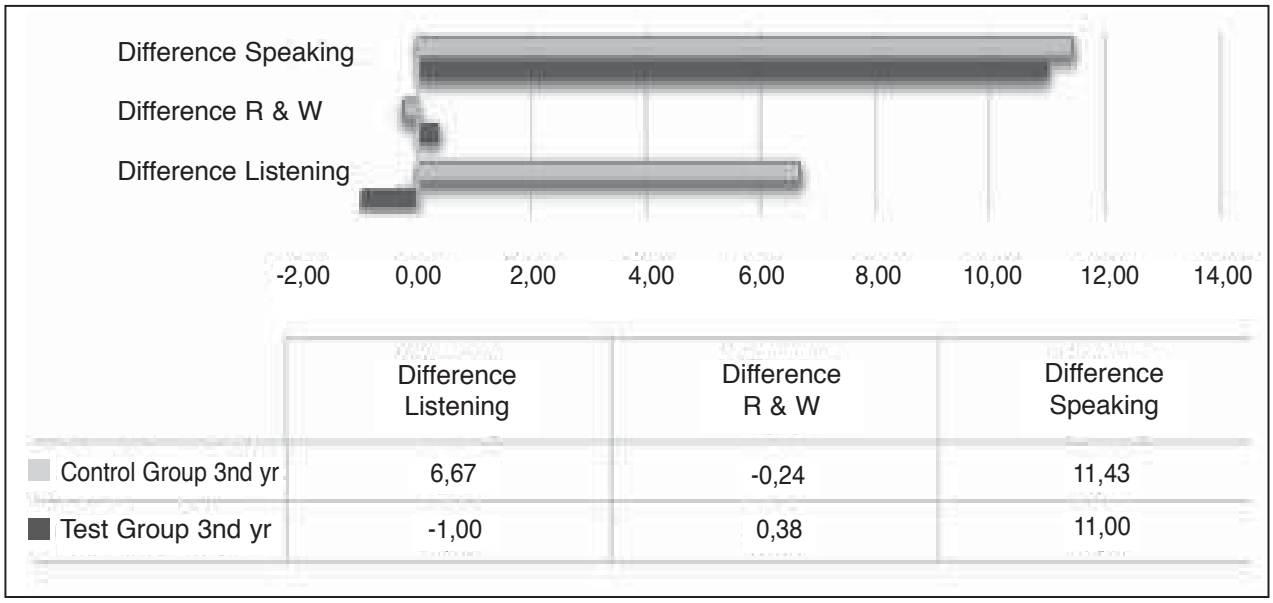
Figure 13. 2nd year/by skill. Comparison between language test scores before and after intervention.
Source: Author.



	Difference in Listening	Difference in R & W	Difference in Speaking
Control Group 2nd yr	15,00	6,23	1,54
Test Group 2nd yr	18,48	8,26	4,35

The same improvement, however, cannot be seen in the 3rd year test group. While their average scores in the Reading and Writing paper improved slightly more than the 3rd control group, this was the only area to improve at a greater rate than the control group. Listening scores post-intervention even showed a lower average score than the average pre-intervention scores.

Figure 14. 3rd year/by skill. Comparison between language test scores before and after intervention.
Source: Author.



	Difference Listening	Difference R & W	Difference Speaking
Control Group 3nd yr	6,67	-0,24	11,43
Test Group 3nd yr	-1,00	0,38	11,00

We can speculate that the rate of improvement for the 2nd year test group language scores are partly due to the perception of «success» of the mindfulness sessions (Figures 4 & 5). Nevertheless, it is possible that the results for all groups have been influenced by a number of factors other than the use of mindfulness techniques. Different groups have different teachers which can affect stress levels (stress contagion effect) and pupils' attitude, as well as learning. The tests took place at different times of day which can affect levels of concentration and stress as cortisol levels vary from highest in the morning after waking, and reducing throughout the day (Schonert-Reichl et al. 2015). The academic profile of each child in each class varies, as does the overall English level of the class, and the number of children with difficulties may affect their learning or participation in class activities (Table 1). The difference in class size (Table 1) between the groups is statistically significant, with control group year 2 having 26 pupils as compared to test group year 3 with 20, which is 30% larger. This could potentially affect the results, as a larger group can be, though not always, more complex to teach, and could potentially skew the results in the language test, and the comparison between classes.

Test group 3 would possibly have responded more favourably to the mindfulness sessions if the time limits of this study had not been so restricted, as in the second half of the intervention the sessions were evolving favourably (Figure 7).

4.6. Impressions from test group 2 teacher's semi-structured interview

The teacher's observations suggest an improvement in two key areas: the children's ability to absorb and acquire new knowledge, and a greater awareness of feelings. The teacher stated «...after each session, they can learn new knowledge more easily. They are more attentive. Calmer».

This suggests that the children are more relaxed, and potentially the affective filter is lower, facilitating the acquisition of new knowledge. It is not clear how long these effects last. The brevity of the study, and comments from test group 2, suggest that the improvement in attention is short-lived.

The children were reported as having a greater awareness of their feelings and those of others: «[They are] more conscious that they can change their feelings and the feelings of those around them». This may indicate a growing awareness that feelings are transient, and can be changed through both internal and external factors. Perhaps more importantly, the children began to be able to identify their feelings by naming them. This is a critical step in self-regulation: conceptualisation cannot occur without awareness. If we cannot name and describe our emotions, and how they affect us, it is extremely difficult to know how to understand our moods and feelings, and subsequently how to regulate them. A necessary step to improving anxiety levels when faced, for example, with a teacher asking you a question in English that you do not understand, is recognizing that you feel anxious and why. This enables you to address the situation.

All in all, the teacher's observations indicate that the mindfulness sessions may have temporarily created a calmer learning environment, which may potentially support language learning. This appears to be in line with other studies. According to Schonert-Reichl & Stewart Lawlor (2010, p. 12) teachers commented that they «often saw an immediate change in students' behaviours-and that students were able to focus and pay attention to their academic lessons more easily».

4.6.1. Conclusions and implications

The overall findings of the study suggest that the use of mindfulness techniques in the primary classroom may be of use in creating a calmer environment that aids language learning and attentional skills. While it is unclear

whether anxiety and the affective barrier have been lowered, the language testing results suggest a modest improvement in the content and language learned during the intervention for test group 2, over and above test group 3, and both control groups. In the limited time scale of this study, it is unlikely to see an evident improvement in their level of competence, as language learning is a lengthy process. Moreover, while language tests were used to observe any improvements objectively, these have a number of specific limitations when determining a learner's language level, such as increasing test anxiety, and negatively affecting performance.

The intervention was largely perceived to be positive by the class teacher who observed a calmer atmosphere in the class, and greater attention of the pupils towards the class content after each mindfulness session. Whether this improvement is due to the effectiveness of the mindfulness sessions is uncertain, as neither the results for the CAMM scores or attitude to English questionnaire are conclusive.

Nevertheless, the observation of disturbance versus attention in the sessions suggest that test group 2 were more constant in both a higher attention and lower disturbance throughout, as compared to test group 3. We can conclude that for any beneficial effects to be noticed it is necessary for the pupils to willingly and attentively participate in the training. It became clear that if mindfulness is not accepted by the group due to a higher number of disruptive children, or with learning difficulties, such as in executive functions, the trial may need to be of a considerably longer duration for any effects of mindfulness training and language learning to be evident.

4.7. Limitations of research and methodology

Many additional factors may have influenced the findings. The overall climate in the school, or the teaching staff responsible for each class may directly influence the children's acceptance, or lack, of mindfulness.

For full benefits, mindfulness is normally taught by a trained and certified instructor. The use of guided mediations for children, recorded by qualified instructors, could not be used as the language was too advanced. The meditations, therefore, had to be improvised, each one adapted to the language level and circumstances, such as the levels of excitement.

Mindfulness may be more effective in one's L1, due to the complexity of the concepts involved. However, due to the limitations of the project taking place within a school with a «one face, one language» policy, this was not possible. For the children, the whole procedure, (questionnaires, meditation sessions, discussions) took place in English (the L2, or L3 for some students). The average class level in speaking and listening, according to test scores, is A1-2. A lower understanding of the L2 may result in 1) less effective meditation; 2) less accuracy in pupils' self-reporting.

Age as well as language could impact the results. The CAMM scale, as previously mentioned, was not designed for children as young as seven, as it requires conceptual understanding, and ability to self-report accurately.

4.8. Further research

Several areas for further research exist. A longer study could research the improvement in attitude and L2 level in the mid to long term between control and test groups, by evaluating after a year, and five years. As established previously, there is also a need for further development and testing on mindfulness questionnaires for 7-9-year-olds. Mindfulness, applied in the wider context of Social and Emotional Learning could potentially enhance any possible effects on reducing the affective filter to promote foreign language learning.

BIBLIOGRAPHICAL REFERENCES

Ager, K., Albrecht, N., & Cohen, M. (2015). Mindfulness in schools research project: Exploring students' perspectives of mindfulness-What are students' perspectives of learning mindfulness practices at school?. *Psychology*, *6*(7), 896-914. Retrieved from https://goo.gl/5Y9v9S [Last accessed: 26/07/2017].

American Mindfulness Research Association (AMRA). (2017). Retrieved from https://goo.gl/c4Xexw [Last accessed: 06/07/2017].

Azabdaftari, B. On the sources of child-adult differences in second language acquisition. In L. Scliar-Cabral (ed.), *Psycholinguistics. Scientific and technological challenges* (pp. 195-207). Pontífica Universidade Católica de Rio Grande do Sul. Retrieved from https://goo.gl/qZBu7p [Last accessed: 06/07/2017].

Beauchemin, J., Hutchins, T. L., & Patterson, F. (2008). Mindfulness meditation may lessen anxiety, promote social skills, and improve academic performance among adolescents with learning disabilities. *Complementary Health Practice Review*, *13*(1), 34-45.

Bie, H. M. de, Boersma, M., Wattjes, M. P., Adriaanse, S., Vermeulen, R. J., Oostrom, K. J., ... & Delemarre-Van de Waal, H. A. (2010). Preparing children with a mock scanner training protocol results in high quality structural and functional MRI scans. *European journal of pediatrics*, *169*(9), 1079-1085. Retrieved from https://goo.gl/YKDjZy [Last accessed: 06/07/2017].

Burnett, R., (2013). Mindfulness in schools [Video file]. TEDxWhitechapel. Retrieved from https://goo.gl/K3goa5 [Last accessed: 06/07/2017].

Chaskalson, M. (2011). *The mindful workplace: developing resilient individuals and resonant organizations with MBSR*. John Wiley & Sons.

Clément, R., Dörnyei, Z., & Noels, K. A. (1994). Motivation, self-confidence, and group cohesion in the foreign language classroom. *Language learning*, *44*, 417-417.

Craig, A. D. (2003). Interoception: the sense of the physiological condition of the body. *Current opinion in neurobiology*, *13*(4), 500-505.

Desbordes, G., Negi, L. T., Pace, T. W., Wallace, B. A., Raison, C. L., & Schwartz, E. L. (2012). Effects of mindful-attention and compassion meditation training on amygdala response to emotional stimuli in an ordinary, non-meditative state. *Frontiers in Human Neuroscience, 6*.

Greco, L., Baer, R. A., & Smith, G. T. (2011). Assessing mindfulness in children and adolescents: Development and validation of the child and adolescent mindfulness measure (CAMM). *Psychological Assessment, 23,* 606-614.

Hebb, D. O. (1949). *The organization of behavior: A neuropsychological approach*. John Wiley & Sons.

Hoge, E. A., Bui, E., Palitz, S. A., Schwarz, N. R., Owens, M. E., Johnston, J. M., ... & Simon, N. M. (2017). The effect of mindfulness meditation training on biological acute stress responses in generalized anxiety disorder. *Psychiatry Research*.

Hölzel, B. K., Carmody, J., Evans, K. C., Hoge, E. A., Dusek, J. A., Morgan, L., ... Lazar, S. W. (2010). Stress reduction correlates with structural changes in the amygdala. *Social Cognitive and Affective Neuroscience, 5*(1), 11-17.

Hölzel, B. K., Carmody, J., Vangel, M., Congleton, C., Yerramsetti, S. M., Gard, T., & Lazar, S. W. (2011a). Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research: Neuroimaging*, *191*(1), 36-43.

Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011b). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on psychological science*, *6*(6), 537-559.

Horwitz, E. K., Horwitz, M. B., & Cope, J. (1986). Foreign language classroom anxiety. *The Modern language journal*, *70*(2), 125-132.

Joyce, A., Etty-Leal, J., Zazryn, T., & Hamilton, A. (2010). Exploring a mindfulness meditation program on the mental health of upper primary children: a pilot study. *Advances in School Mental Health Promotion*, *3*(2), 17-25.

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: past, present, and future. *Clinical psychology: Science and practice*, *10*(2), 144-156.

Killingsworth, M. A., & Gilbert, D. T. (2010). A wandering mind is an unhappy mind. *Science*, *330*(6006), 932-932.

Krashen, S. (1982). Principles and practice in second language acquisition. Retrieved from [Last accessed: 26/07/2017].

Krashen, S. D. (1981). *Second language acquisition and second language learning*. Oxford University Press.

Kuyken, W., Weare, K., Ukoumunne, O. C., Vicary, R., Motton, N., Burnett, R., ... & Huppert, F. (2013). Effectiveness of the mindfulness in schools programme: non-randomised controlled feasibility study. *The British Journal of Psychiatry*, *203*(2), 126-131. Retrieved from https://goo.gl/L6oETk [Last accessed 06/07/2017].

Lawlor, M. S., Schonert-Reichl, K. A., Gadermann, A. M., & Zumbo, B. D. (2014). A validation study of the mindful attention awareness scale adapted for children. *Mindfulness*, *5*(6), 730-741. Retrieved from https://goo.gl/Fjp1Hm [Last accessed: 06/07/2017].

Lazar, S. W., Kerr, C. E., Wasserman, R. H., Gray, J. R., Greve, D. N., Treadway, M. T., ... & Rauch, S. L. (2005). Meditation experience is associated with increased cortical thickness. *Neuroreport*, *16*(17), 1893.

LOMCE. (2013, December 10th). Ley Orgánica 8/2013, de 9 de diciembre, para la mejora de la calidad educativa. *Boletín Oficial del Estado (BOE)*, *295*, 97858-97921. Retrieved from https://goo.gl/982AV8 [Last accessed: 26/07/2017].

Napoli, M., Krech, P. R., & Holley, L. C. (2005). Mindfulness Training for Elementary School Students. *Journal of Applied School Psychology, 21*(1), 99-125.

Schonert-Reichl, K. A., & Lawlor, M. S. (2010). The effects of a mindfulness-based education program on pre-and early adolescents' well-being and social and emotional competence. *Mindfulness*, *1*(3), 137-151.

Schonert-Reichl, K. A., Oberle, E., Lawlor, M. S., Abbott, D., Thomson, K., Oberlander, T. F., & Diamond, A. (2015). Enhancing cognitive and social-emotional development through a simple-to-administer mindfulness-based school program for elementary school children: A randomized controlled trial. *Developmental psychology*, *51*(1), 52. Retrieved from https://goo.gl/afetvb [Last accessed: 06/07/2017].

Semple, R. J., Lee, J., Rosa, D., & Miller, L. F. (2010). A randomized trial of mindfulness-based cognitive therapy for children: promoting mindful attention to enhance social-emotional resiliency in children. *Journal of Child and Family Studies, 19*(2), 218-229.

Siegel, D. (2014) *The essence of adolescence* [Blog]. Retrieved from https://goo.gl/PFAkJi [Last accessed: 26/07/2017].

Siegel, D. J. (2007). Mindfulness training and neural integration: differentiation of distinct streams of awareness and the cultivation of well-being. *Social cognitive and affective neuroscience*, *2*(4), 259-263. Retrieved from https://goo.gl/K6vSh2 [Last accessed: 06/07/2017].

Siegel, R. D., Germer, C. K., & Olendzki, A. (2009). Mindfulness: What is it? Where did it come from?. In *Clinical handbook of mindfulness* (pp. 17-35). Springer New York.

Tang, Y. Y., Hölzel, B. K., & Posner, M. I. (2015). The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience*, *16*(4), 213-225. Retrieved from https://goo.gl/W7SKVg [Last accessed: 06/07/2017].

Tang, Y. Y., Yang, L., Leve, L. D., & Harold, G. T. (2012). Improving executive function and its neurobiological mechanisms through a mindfulness-based intervention: Advances within the field of developmental neuroscience. *Child development perspectives*, *6*(4), 361-366.

UCLES. (2017). *Cambridge English: Young Learners*. Retrieved from https://goo.gl/zdb5ob [Last accessed: 06/07/2017].

Vickery, C. E., & Dorjee, D. (2015). Mindfulness training in primary schools decreases negative affect and increases meta-cognition in children. *Frontiers in psychology*, *6*.

Young, D. J. (1991). Creating a Low-Anxiety Classroom Environment: What Does Language Anxiety Research Suggest? *The modern language journal*, *75*(4), 426-437.

Zylowska, L., Smalley, S. L., & Schwartz, J. M. (2009). Mindful awareness and ADHD. In *Clinical handbook of mindfulness* (pp. 319-338). Springer New York. Retrieved from https://goo.gl/LqH5U5 [Last accessed: 06/07/2017].

CITA DE ESTE ARTÍCULO (APA, 6ª ED.):

Mortimore, L. (2017). Mindfulness and Foreign Language Anxiety in the Bilingual Primary Classroom. *Educación y Futuro: Revista de investigación aplicada y experiencias educativas*, *37,* 15-43.