

Article

Autonomy-Supportive and Controlling Teaching in the Classroom: A Video-Based Case Study

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Abstract: This study explored teachers' autonomy-supportive and controlling behaviors through video-taped observation in the classroom. Four lessons by two teachers from a secondary school in Finland were videotaped and analyzed using a rigorous coding protocol. It was found that teachers employed both autonomy-supportive and controlling teaching during the same lesson, and even combined them in the same instructional sequence. This finding suggests the complexity of the use of autonomy support and control in the classroom, as well as their context-dependent aspects. The novel finding from this study was that teachers showed error tolerance and creativity to support students' autonomy. Showing error tolerance and teaching creatively have not been investigated from the perspective of autonomy support in previous research. Furthermore, this study suggested that indirect control and its negative effects on students' learning and well-being should arouse more concern in future research. Implications for teaching practice concerning supporting students' autonomy have been provided.

Keywords: autonomy support; controlling teaching; error tolerance; creativity

1. Introduction

Guided by self-determination theory (SDT) [1,2], the present study aimed to explore teachers' autonomy support and control through video-taped observation in the classroom. SDT research has found that autonomous motivation is associated with positive outcomes, such as effort, performance, persistence, self-esteem, and well-being, as opposed to controlled motivation [3]. Teachers can enhance students' autonomous motivation through autonomy support, which involves respecting and integrating student perspectives into teaching [4–6]. However, teachers can suppress students' autonomous motivation with controlling teaching, which ignores students' perspectives and pressures them into behaving in a teacher-prescribed way [5,7–9]. Research has shown that controlling teaching, which is associated with negative student functioning (e.g., poor performance), is more commonly enacted than autonomy-supportive teaching, which is associated with positive student functioning (e.g., engagement) [5,6].

Theory-based studies [6,10–13] have been conducted to help teachers become more autonomy-supportive and less controlling. However, these studies have either focused only on autonomy support but neglected controlling teaching [6,10], or presented trained teachers only with classroom examples of autonomy support but without examples of concrete control [12,13]. This finding is surprising because research indicates that, to some extent, teachers engage in both autonomy-supportive and controlling teaching during instruction [14]. Teachers may also adopt controlling strategies instead of autonomy support because they equate control with structured classrooms, which provide clear expectations and specific information, whereas they associate autonomy with chaotic and permissive classrooms [5]. Therefore, additional research could be

effective in helping teachers to become more autonomy-supportive and less controlling if it provided concrete classroom examples of both autonomy support and control to help teachers avoid misconceptions of either or both.

Previous research has typically investigated teachers' autonomy support and control based on raters' scores of teachers' controlling (e.g., lowest = 1) and autonomy-supportive (e.g., highest = 7) behaviors on a bipolar scale [11,13]. Such evaluation generally understands controlling teaching simply as the opposite of autonomy support; that is, each autonomy-supportive behavior has a counterpart controlling behavior (e.g., providing explanatory rationales versus neglecting explanatory rationales, and acknowledging negative affect versus rejecting negative affect). However, this conceptualization may inhibit the discovery of indirect (subtle) controlling behaviors [9], to which perhaps no autonomy-supportive counterpart behavior could be contrasted. For example, conditional regard [15] is a means of indirect control that refers to providing attention, affection, or support only if particular behaviors are displayed. However, conditional regard may not easily be discovered by contrast with any autonomy-supportive behavior on a bipolar scale. Furthermore, teachers' indirect (subtle) control is no different from direct (explicit) control in undermining students' motivation [9]. Thus, it is crucial to include indirect controlling behaviors in the investigation or evaluation of teachers' controlling strategies versus autonomy support.

Empirical studies, such as student surveys, teacher reports, and classroom observations, are used to investigate autonomy-supportive and controlling teaching. Quantitative studies tend to employ questionnaires to assess students' perceptions of teachers' autonomy-supportive or controlling behaviors [4,16,17], but cannot explore teachers' specific autonomy-supportive or controlling strategies in depth. Teacher self-reports [18] describe specific autonomy-supportive behaviors but lack exploration of their controlling behaviors. In observational studies, autonomy support has been evaluated in terms of level by raters during their classroom visits [19], through raters' scoring of the frequency of autonomy-supportive behaviors in videotaped lessons [18,20,21], or reported by qualitative illustrations from excerpts of videotaped lessons [22,23]. However, observational studies that provide qualitative illustrations of autonomy support as well as direct and indirect controlling teaching are rare.

In sum, it is important to include teachers' autonomy support and direct and indirect control in research. The present study recognized that illustrative and observational studies with this research focus are rare. Thus, this study aimed to identify both autonomy support and control (direct and indirect), and to provide illustrations of each via a video-based case-study analysis of teaching in the classroom. Theories and research about autonomy support and control and the advantages of qualitative video-based observations have been elaborated in the following sections.

1.1. Autonomous Versus Controlled Motivation

SDT [1,2] posits that autonomy is an inherent psychological need that motivates people to pursue their interests, curiosity, or goals with a sense of psychological freedom (volition) and choice (decision-making). Therefore, to be autonomous means being self-governed with self-directed action, whereas being controlled means to act under direction or coercion. Thus, a person's behavior, with or without inner endorsement, reflects either autonomous or controlled motivation. Specifically, autonomous motivation is defined as engaging in an activity for interest and enjoyment (intrinsic motivation) or a sense of personal value and importance (identified regulation). In contrast, controlled motivation is characterized by the pursuit of an outcome that complies with external pressuring demands (external regulation) or avoiding internally pressuring feelings of guilt and shame (introjected regulation).

Numerous studies have explored autonomous and controlled motivations, as well as their relevant variables, which are affected by different teaching strategies. Teaching methods that support students' autonomy positively impact their intrinsic motivation, psychological well-being (e.g., positive affect), behavioral persistence, enhanced performance, and achievement [6,24,25]. However, teaching that makes students feel controlled results in non-self-determined motivation

(i.e., amotivation), students' negative affects (e.g., anger, anxiety), restricted engagement, poor achievement, and psychological ill-being [7,26,27].

1.2. Autonomy Support

Autonomy support refers to what a person says and does to enhance another's internal perceived locus of causality (the idea that action originates from and is regulated by the self), which relates to a sense of psychological freedom and choice [2,28]. Autonomy support in the classroom also refers to the integration of student perspectives, including personal interests, preferences, intrinsic goals, and self-endorsed values in classroom activities [4,5,8].

The elements of behaviors that concern autonomy support have been identified based on various operational definitions. For example, in laboratory experiments [29] and empirical research [4,30] where autonomy support was focused on enhancing the internal perceived locus of causality, four important elements of autonomy support were identified: (1) providing explanatory rationales, (2) acknowledging negative affect, (3) using non-controlling language, and (4) offering choices. When the definition of autonomy support was expanded to nurturing students' psychological needs (autonomy, competence, and relatedness) at a broad level, a fifth element (nurturing inner motivational resources) was added [31]. At least four of these five categories have been included in the design of most (16/19) intervention programs, according to a meta-analysis of the effectiveness of intervention in supporting autonomy [32]. This finding indicates the importance of these categories of autonomy support, although various studies may operationally define autonomy support differently. It is important to note that, since the fifth category is broad, the present study focused on the first four categories and only part of the fifth one.

Providing explanatory rationales refers to verbal explanations that help students understand why self-regulation of a learning activity has personal utility [29], or how the learning process is relevant to and supportive of their interests, goals, and values [4]. Participants who were given explanatory rationales for a learning task reported higher perceived autonomy and displayed greater engagement than those who were not given rationales [4,33,34].

Acknowledging negative affect refers to accepting, or even welcoming, student criticisms or expressions of negative affect (e.g., "this is boring") about a learning activity, even though they might conflict with teachers' expectations; in this way, student feelings are treated as potentially valid reactions or a useful source of improvement in specific lesson structures and activity designs [4,5,19]. Students whose criticism or negative affect was allowed reported higher perceived autonomy and displayed greater engagement than those whose criticism was suppressed [4,35].

Using non-controlling language refers to non-evaluative, flexible, and informational communication that avoids rigid and pressuring phrases such as "should", "must", "got to", and "have to", and uses volitional phrases such as "can", "could", and "may" to convey classroom rules, requirements, and expectations [19,29]. Participants who were exposed to non-controlling language reported higher perceived autonomy and displayed greater engagement than those exposed to controlling language [36].

Offering choices refers to providing options, opportunities for choice-making, and encouragement of self-initiation of learning tasks that students perceive to be consistent with their goals or interests [4,30]. Encouraging students' self-paced learning [5] could also be included in offering choices, because students who are allowed to work at their own pace can choose when to start, how to proceed, and how much time to spend on a learning task. Although students who choose their assignments report higher perceived autonomy and display greater engagement than those who do not [4,28], different learning outcomes might be produced from three distinct types of choice, namely organizational, procedural, and cognitive [37]. Organizational choices concern decisions about the layout of classroom activities (e.g., allowing students to choose a partner) and procedural choices refer to the selection of classroom materials and equipment (e.g., offering students choices in the use of exercises), whereas cognitive choices focus on the processing of opinions about the learning content (e.g., encouraging students to evaluate their own or others'

solutions or ideas). The literature shows that cognitive choices foster more enduring and deep-level student engagement than organizational or procedural choices.

Nurturing inner motivational resources is a broad category of autonomy support because inner motivational resources are found in several categories: for example, psychological needs (autonomy, competence, and relatedness), interests, and preferences [31]. The present study explored two components of nurturing inner motivational resources, namely fostering interest in learning and praise as informational feedback, because interest [38] and feedback [19] have been widely studied in motivational research. First, fostering interest in learning is composed of nurturing feeling-related and value-related valences, for example, promoting student feelings of enjoyment, sense of challenge, and curiosity of an activity [39,40]. Second, praise as informational feedback emphasizes its competence-affirming function. Teachers' positive feedback does not always enhance students' intrinsic motivation, because when praise is used as an extrinsic reward for right answers and acceptable behaviors, it can be experienced as a form of interpersonal control; thus, praise is autonomy-supportive only when it is used to affirm students' competence, e.g., effort, progress, or improvement [35,41].

1.3. Controlling Teaching

Controlling teaching is closely associated with controlled motivation, which includes external and introjected regulations [2]. External regulation comes from contingent consequences administered by others (e.g., rewards and punishments), whereas introjected regulation comes from contingent consequences that are self-administered (e.g., self-esteem or threats of guilt and shame) [2,42,43]. Although introjected regulation is within the person, it is still relatively external to the self, because this regulation is experienced without internal self-endorsement but with internal control to avoid guilt or shame or to gain approval from others [42].

Controlling teaching, therefore, includes direct (external) [7] and indirect (internal) [9] types. Direct controlling teaching involves explicit attempts to fully and instantly change student behaviors or thoughts: for example, by imposing deadlines, surveillance, or giving directives, rewards, or threats of punishment, so that students are motivated by external regulation [5,7]. Indirect controlling teaching entails subtle or covert attempts to cause feelings of shame, guilt, and anxiety, by linking students' behaviors with their self-esteem, providing contingent affection, or threatening to withdraw attention or approval, so that students are motivated by introjected regulation [9,15,44]. In general, controlling teaching refers to tactics teachers use to pressure students to think, feel, or behave in a teacher-prescribed way without considering student perspectives [8,27]. Five categories of controlling teaching strategies, including direct and indirect ways, are elaborated below, selected based on the level of attention the educational literature has given them.

Relying on outer sources has long been studied as an external or direct means of control, which involves giving deadlines, rewards, or punishments to motivate students' engagement in an activity [5,42,45]. Relying on outer sources has been found to undermine intrinsically motivated behavior [25] and is negatively related to students' intrinsic motivation and identified regulation [45].

Using controlling language is another category of direct controlling teaching to which the educational literature has paid much attention. It refers to pressuring students into compliance with statements like "should", "have to", "must", or "got to", or with directives and commands without providing rationales for expected behaviors [5,35,45]. Controlling language has been found to lead to students' amotivation intertwined with anger and anxiety [7].

Rejecting negative affect has also drawn researchers' attention as a category of direct controlling teaching. It refers to responding to students' complaints or expressions of negative affect about a learning activity with authoritarian power assertions [5], or suppressing student criticism and independent opinions [4,7]. Rejecting negative affect has been found to lead to student amotivation [7], and is the strongest predictor of negative feelings and poor engagement among autonomy-suppressing behaviors [4].

Creating ego involvement as a construct of indirect control has gained increasing attention in the educational literature. When ego-involving conditions are created, students are pressured to perform by internal feelings of guilt, shame, anxiety, and self-worth [42]. Creating ego involvement involves guilt induction (e.g., “A lot of kids follow the guidelines to feel good about themselves and to avoid feeling guilty for not doing so”) [9], and shaming by belittling someone (e.g., “Even a toddler could do this, so why couldn’t you?”) or shaming with public criticism [46]. Research indicates that creating ego involvement is negatively associated with students’ intrinsic motivation and predicts their poor motivation [45].

Conditional regard, another construct of indirect control, has also received increasing attention in the parental and educational literature. This construct refers to providing attention, affection, or support only if particular behaviors are displayed (positive regard) or withdrawing such attention, affection, or support when specified behaviors are not displayed (negative regard) [15]. Assor and colleagues [15] found that conditional regard in the family is related to fluctuations in children’s self-esteem, perceived parental disapproval, and resentment of parents. Teachers may also use conditional negative regard by withdrawing attention, interest, or care when students fail to behave or achieve as expected [27]. Further, teachers’ conditional negative regard negatively predicts students’ perceived need satisfaction [47].

1.4. Advantages of Qualitative Video-Based Observations

Major ways of exploring teacher autonomy support or control in the literature include student reports, teacher reports, experiments, and observations. Although each method has its pros and cons, observations (qualitative video-based, in particular) complement the other measurements with the following advantages. First, observations [22] provide a more informative understanding of teaching strategies compared to student reports [4], which assess only overall student perceptions of teaching styles. Second, observations (video-based, in particular) have higher validity than teacher reports, because teachers do not always report their actual teaching practices [48]. Video-based observations of real classroom episodes, therefore, can address this problem by using repetitive observations by raters or coders. Third, observations have higher validity than experiments because the former are based on real classroom settings, while the latter rely on the design of conditions. For example, Furtak and Kunter’s experiment [16] found that students felt controlled by the conditions intended to be autonomy-supportive. This finding highlighted possible discrepancies between expectations and outcomes of experimental conditions. Fourth, qualitative video-based observations can provide vivid and concrete illustrations of teacher–student interactions that quantitative records of observations cannot, because in the latter [20], raters only report the frequency or level of teaching strategies, rather than investigating specific examples of teaching strategies. In sum, qualitative video-based observations complement student reports, teacher reports, experiments, and quantitative observations regarding validity and in-depth investigation, and therefore lead to valuable insights into practical teaching strategies concerning autonomy support and control.

2. Research Questions

As noted in the introduction, there is a need for both autonomy support and control [8], and both direct [7] and indirect controlling teaching [9] to be addressed in the literature, but illustrative observation studies with such a focus are rare. Therefore, to fill this research gap, the present study investigated both autonomy-supportive and controlling (direct and indirect) behaviors and also explored illustrative classroom examples of these behaviors. Further, due to the advantages of video-based case analysis, it was insightful to trace how autonomy-supportive and controlling teaching developed during a lesson through videotaped observation. Consequently, the present study focused on the following research questions:

- (1) How does autonomy-supportive and controlling teaching develop during a lesson?
- (2) What are the categories of teachers’ autonomy-supportive and controlling behaviors?

- (3) What do teachers say and do to employ autonomy-supportive and controlling teaching?

3. Methods

3.1. Participants

Since the present research used an in-depth case-study analysis, the size of the sample was kept small. The two participating teachers, with the pseudonyms of Anne and Laura, were from a secondary school in southwestern Finland. They gave their consent to participate after being informed that the focus of the study was on autonomy-supportive and controlling teaching, and that it would involve video observations of their classes. The selection of samples was made by the researchers to ensure that the participating teachers were representative of different teaching backgrounds, and that the video-taped lessons reflected regular teaching. Anne, whose teaching experience was thirty years, was the Finnish subject teacher of classes 7B and 8B; and Laura, whose teaching experience was five years, was the English subject teacher of classes 7C and 8C. Both teachers helped students with their academic achievement in the subject they taught. In addition to her role as a subject teacher, Laura was also the homeroom teacher of class 8C. The role of a homeroom teacher in the Finnish context is to take the broader responsibility of a class of students, being accountable for their attendance, wellbeing, and safety, and acting as the contact person for parents. Table 1 summarizes the relevant background information about these two teachers. While Anne was more experienced in teaching than Laura, Laura had nevertheless been given the important responsibility of a homeroom teacher. This background information was expected to assist in interpreting their respective autonomy-supportive and controlling behaviors, because teaching experience [6] and responsibility and accountability [5] have been found to affect the use of autonomy support and control.

The students who took part in the videotaped lessons were also approved to participate by their parents, using consent forms. Four lessons, two from each teacher, were videotaped. The duration of each lesson ranged from 24 to 30 minutes. The lessons were from the classes in the seventh and eighth grades. The number of students in each class ranged between 16 and 20, and their age from 13 to 15 years.

Table 1. Background information on the teachers.

Teacher	Gender	Subject	Teaching Years	Grade/Class	Homeroom Teacher (Yes/No)
Anne	Female	Finnish	30	7B & 8B	No
Laura	Female	English	5	7C & 8C	Yes (8C)

3.2. Procedure

The four lessons were videotaped during regular teaching, using a digital camera. Since this research focused on teachers' behaviors, the camera was positioned at the back of the classroom, facing the teacher. Because the students were seated in rows or small groups, only the backs or profiles of the students could be filmed unless they turned around or sat facing the camera. All verbal interactions in the videos were transcribed and subtitled in English for data analysis. Three educational researchers (two Finnish native speakers) then engaged in a rigorous and systematic process to develop coding schemes and data analysis through discussion. This process included identification and adaptation of coding categories based on an extensive literature review, interpretation of video episodes, individual coding, joint meetings, clarification of emerging issues, integration of different perspectives, and resolution of disagreements through discussion. Six phases were involved iteratively and cyclically before and during coding.

In the first phase, the first and second coders collaboratively developed the coding schemes *a priori*, based on an extensive review of the literature concerning autonomy support and control. The coding categories were identified and modified as the literature review proceeded. In the second phase, the same two coders individually coded the videos based on the coding schemes, using the linguistic annotation software ELAN, version 5.0.0 (Max Planck Institute for Psycholinguistics,

Nijmegen, Netherlands) [49]. Any emerging issues were noted for discussion in the joint meetings. In the third phase, a series of intensive meetings were held by these two coders, in which emerging issues were discussed and perspectives were compared and integrated. In the fourth phase, the third coder, who did not take part in developing the coding schemes, coded the videos individually to contribute a fresh perspective and avoid bias. In the fifth phase, a series of intensive meetings were held by the first and third coders to compare what was produced by the first two coders and by the third one. In the sixth phase, a final meeting was held by the first and second coders to discuss discrepancies between their coding and that of the third coder. Disagreements on coding were resolved, and a final agreement was reached after these meetings.

3.3. Coding Protocol

The coding schemes of teachers' autonomy-supportive and controlling behaviors are presented in Tables 2 and 3. In addition to the coding schemes, a set of guidelines were also created before coding and were modified during coding whenever new problems emerged, in order to conduct a more rigorous and in-depth video analysis, as follows:

1. Codes were only applied to teachers, not to students. A code started and ended with a teacher's utterances (verbal). Teachers' tones and gestures (nonverbal) were interpreted to confirm meanings of utterances, but were not coded independently of utterances. Teachers' verbal and nonverbal expressions were also interpreted based on their contexts. For example, what students said or did before or after was taken into consideration in understanding teachers' verbal and nonverbal expressions.
2. A code could be in more than one coding category. If the meanings of teachers' utterances in a code involved more than one category of autonomy-supportive or/and controlling behaviors, this code could be in multiple coding categories at the same time.
3. When coding controlling or non-controlling language, it was not sufficient to code an utterance as controlling or non-controlling only by finding the symbol word, such as "have to" or "can", since the interpretation of a word is also based on context. For example, when a teacher is making suggestions, "have to" may not be intentional use of controlling language, but rather, just an ill-chosen word; it is only when obviously giving an official order to students and using "have to" that she is using controlling language.

It is important to note that a code was accepted only when all three coders agreed with it. If any coder disagreed with a code, the code was deleted and treated as an unclear or ambiguous code. Ambiguity might occur because teachers' utterances were too short to capture their meanings completely, were not expressed clearly and had more than one meaning, or had contradictory meanings suggested by tones or gestures. In other words, only clarified autonomy-supportive and controlling behaviors in the videos were coded. Finally, inter-coder reliability was calculated using ELAN. Cohen's kappa was used to represent inter-coder reliability, which refers to the ratio of annotation overlap and values (Cohen's κ in each video: minimum = 0.87, maximum = 0.93). Cohen's κ should have been 1.00 because all disagreements were resolved through discussion; however, the calculation of reliability in ELAN is sensitive to time differences of even a second between two coded files. It was impossible for coders to have an identical overlap of time without differences of even one second. Therefore, Cohen's κ , as reported above, reflected the high reliability of our coding, as well as the accuracy of the built-in function of ELAN.

Table 2. Coding scheme of autonomy-supportive behaviors.

Categories	Teachers' Specific Behaviors
Providing explanatory rationales	Verbal explanations that help students understand why self-regulation of a learning activity has personal utility [4,29,33,34].
Acknowledging negative affect	Accepting, or even welcoming, student criticisms or expressions of negative affect (e.g., "this is boring") that might conflict with teachers' expectations [4,5,19,35].
Using non-controlling	Communications that minimize pressure (absence of "should", "must", "got to", and

language	“have to”) and convey a sense of choice and flexibility with the use of, e.g., “can”, “could”, or “may” [19,29,36].
Offering choices	Providing students with options, respecting their preferences, encouraging their self-paced learning and self-evaluation [4,5,28,37].
Fostering interest in learning	Promoting students’ feelings of enjoyment, sense of challenge, and curiosity during engagement in an activity [5,31,39,40].
Praise as informational feedback	Showing appreciation for students’ effort, persistence, opinions, improvement, or performance [19,35,41].

Table 3. Coding scheme of controlling behaviors.

Categories	Teachers’ Specific Behaviors
Relying on outer sources	Giving deadlines, rewards, or threats of punishments to motivate students to engage in an activity [5,25,42,45].
Rejecting negative affect	Responding to students’ complaints, criticisms, or expressions of negative affect about a learning activity with authoritarian power assertions [4,5,7].
Using controlling language	Pressuring students into compliance with words like “should”, “have to”, “must”, or “got to”, using directives or commands, and neglecting explanatory rationales for expected behaviors [5,7,35,45].
Creating ego involvement	Pressuring students to act by creating internal compulsions or feelings of guilt, shame, and anxiety, e.g., guilt induction, shaming, and public criticisms [9,42,45,46,].
Conditional regard	Providing attention, affection, or support only if particular behaviors are displayed, or threatening to withdraw such attention, affection, or support when specified behaviors are not displayed [15,27,47].

4. Findings

4.1. How Autonomy-Supportive and Controlling Teaching Develops during a Lesson

It was found that teachers employed both autonomy-supportive and controlling teaching during the same lesson, and even combined both autonomy support and control in the same instructional sequence. It was remarkable that both Anne’s autonomy support and control took place in the second minute of the lesson, within the same instructional sequence. This combination was only found in Anne’s teaching of 8B (see Figure 1). In contrast, Laura employed controlling teaching more intensively at the end compared to the beginning and middle of the lesson with 8C. Furthermore, she employed controlling teaching more intensively with 8C than in 7C (see Figure 2).

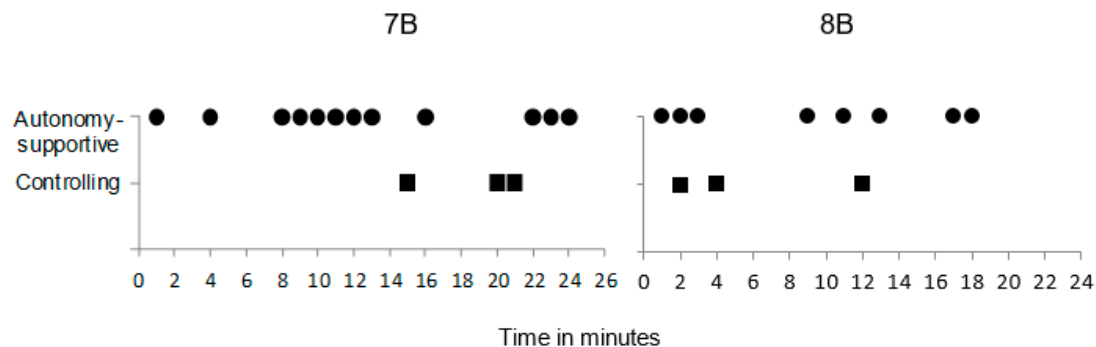


Figure 1. Autonomy-supportive and controlling teaching by Anne. Note: Round and square markers represent the existence of autonomy support and control, respectively. It is possible that more than one autonomy-supportive or controlling behavior took place in a specific minute.

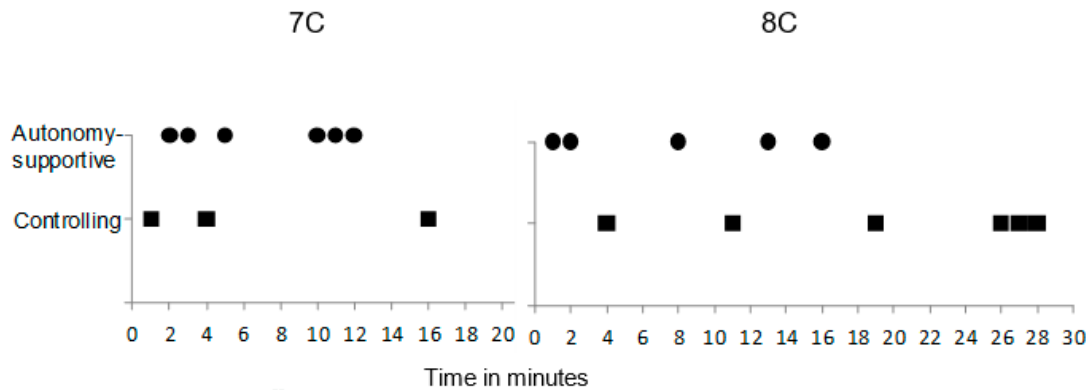


Figure 2. Autonomy-supportive and controlling teaching by Laura. Note: The same as shown in Figure 1.

4.2. Categories of Teachers' Autonomy-Supportive and Controlling Behaviors

The categories of teachers' autonomy-supportive behaviors included in the coding scheme were all found in the video-taped lessons. These categories included providing explanatory rationales, acknowledging negative affect, using non-controlling language, offering choices, fostering interest in learning, and praise as informational feedback.

In addition to the above-mentioned categories, error tolerance emerged during data analysis and was identified as a new category of autonomy-supportive teaching strategies, though not included originally in the coding scheme. In this study, only Anne showed error tolerance with students. Error tolerance by Anne describes her efforts to acknowledge and discuss students' mistakes while respecting their feelings. This teaching strategy involves establishing a positive error culture, which encourages students to see their mistakes as learning opportunities, and also involves teachers' displaying patience in supporting students to correct their errors themselves while avoiding negative responses, e.g., annoyance or ridiculing students [50]. Error tolerance should not be equated with error indulgence or permissive classroom management, which consists of ignoring students' errors without setting any rules or standards of behavior and allowing students to do whatever they want [51]. Instead, error tolerance is characterized by noticing student errors, guiding students to correct errors by themselves and, at the same time, taking care of students' self-esteem and feelings [52]. To our knowledge, no prior study has explored error tolerance from the perspective of autonomy support. Error tolerance entails encouraging students to correct mistakes by themselves and taking into account students' affect (e.g., anxiety) during error correction, which are related to students' self-regulated learning and teachers' consideration of students' perspectives during teaching. Both are elements of teachers' autonomy support [8]. Only Anne was found showing error tolerance to students in this study.

The categories of teachers' controlling behaviors including rejecting negative affect, using controlling language, creating ego involvement, and conditional regard, were found in the video-taped lessons. However, relying on outer sources was not found to be displayed by either teacher during the lessons.

4.3. Illustrations of Autonomy-Supportive and Controlling Teaching

The illustrations of teaching in this section are provided to address questions about what teachers say and do to employ autonomy-supportive and controlling teaching. The goal of these illustrations is to provide practical classroom examples of autonomy-supportive and controlling teaching strategies and their elaborated interpretations, which may assist teachers to self-reflect on the motivational strategies they employ. These examples of actual teacher–student interactions could help teachers to think about whether they have showed similar teaching behaviors in the classroom, and how these behaviors could impact their students.

4.3.1. Episodes from Anne's Lessons

Regarding *Anne's Finnish lesson in 7B*, she first provided students with time to review Finnish indefinite pronouns by themselves. She then asked them to take a small test and list the indefinite pronouns they knew. Later, Anne and her students went through the exercises about these pronouns. During the lesson, the students were seated in rows facing the teacher.

Before the small test, Anne offered choices and used non-controlling language to instruct students to review Finnish indefinite pronouns by themselves.

Anne: So, I'm just silent for a moment...And you are too...And at that time you are silent and can close your eyes or put your hands there and try to get them all there and remember how many they are.

During this instruction, Anne encouraged students' self-paced learning by providing them time to recall indefinite pronouns. Simultaneously, she used non-controlling language with "can" to suggest the way they were going to proceed. However, she indicated that they could still choose their own ways to proceed.

She then asked them to take a small test about those pronouns. After completion of this activity, a student expressed that he did not find any benefit in doing so. Anne then reacted by acknowledging this student's negative affect and simultaneously providing explanatory rationales.

Student: I don't see any point doing this.

Anne: This was the most difficult one. That's why we asked it like this. And I asked this like this because if I had just said "read them", I think that you wouldn't have read the types. Or how is it if I said "just read them independently"? Would you have learned them independently by heart?

Student: Maybe not by heart, but I would have read them.

In Anne's reaction, she first acknowledged that this activity was difficult and then explained that its purpose was to help students identify and classify personal pronouns by heart. Although the student did not totally agree with Anne, he indicated that he might not have learned by heart if he did not engage in this activity.

When Anne and her students went through the exercises concerning indefinite pronouns, she showed error tolerance, emphasizing "it doesn't matter" if they made a mistake or did not understand the most difficult questions because they were still practicing.

Anne: This is not so serious anyhow if something is left out...The last one was more like hair-splitting, so just forget it if you did not understand anything, it doesn't matter...It doesn't matter if you make a mistake because we are still practicing.

Anne also showed error tolerance to a student who mistakenly completed exercises from another page of the book.

Student: And on the other page, I've done them all from there.

Anne: Oh no, it can't be, but they are all here! (with a kind tone)

Student: I didn't understand there were also other exercises that you had to search for.

Anne: That's true, I admit. Okay, but it doesn't matter if you have done them. What did you find from there then?

During this interaction, Anne listened to this student's explanation without any negative responses. She even admitted that it was easy to make such a mistake, and allowed this student to report what had been found on the page where she completed the exercises.

However, when she expected all students in the class to know which category of pronouns a word involved, she created ego involvement.

Anne: Now everybody should raise their hand. To which group does "muutama" [a few] belong?...There's still someone's hand down...Wonderful! We should have a photo of this.

In this instruction, Anne created ego involvement to urge students to raise their hands. It remained unknown whether all students knew the answer to the question, but they all raised their hands after she said that someone's hand was still down. Anne might have created internal feelings of shame and anxiety to those with their hands down in the beginning.

Regarding *Anne's Finnish lesson in 8B*, she first invited individual students to read their Finnish writing about an author's career in literature aloud. She then evaluated their writing and explained the evaluation criteria. For those students who did not present their writing publicly, Anne asked them to make a self-evaluation. During the lesson, the students were seated in rows facing the teacher.

When Anne invited individual students to read their writing aloud, she used both autonomy-supportive and controlling strategies in the same instructional sequence. This strategy has been informed previously in Figure 1. She provided an explanatory rationale for the learning activity, but simultaneously created ego involvement to urge them to take part in the activity.

Anne: I think this would be a great opportunity to finish this (reading their writing about an author and clarifying the points they got) if you even care a bit about your grade.

In this instruction, Anne noted that it would be a good time to clarify the quality of their writing before the test by participating in this rehearsal. However, she simultaneously created ego involvement by emphasizing that it would be important to do so if they cared about their grades. This statement could make the students understand the need for rehearsal, but could also create internal compulsions of guilt and shame, because it might imply that they did not care about their grades if they did not take part in the rehearsal.

Nevertheless, when a student mistakenly read an author's age at death as 21 rather than 81, she showed error tolerance without any negative responses.

Student: *The Silmarillion* remained unfinished upon his death in 1973, when he was 21 years old.

Anne: Twenty-one? Did you say so? Did I hear wrong? (with a calm tone)

Student: Oh no, eighty-one.

Anne: I was thinking indeed that he lived a bit longer. All right! (with an encouraging tone)

In Anne's response, she first checked and confirmed the student's mistake. After allowing him to correct the mistake by himself, she asked him to continue his reading by saying "all right" with an encouraging tone.

For those students who did not read their writing aloud, Anne offered choices for their self-evaluation to clarify their points. As mentioned previously in the literature review, her encouragement of their self-evaluation involved cognitive choices.

Anne: You mark down how much you would get for your answer. Would I get eight, or would I get three, or what would I add yet to make it a proper essay?...I put it this way: How many got more than five points? How many got more than eight points? More than ten?

In this instruction, Anne encouraged students to formulate their independent opinions about the criteria of a proper essay and how many useful facts were presented in their own writing. Her provision of cognitive choices might facilitate students' in-depth learning of essay writing.

At the end of the lesson, however, Anne created ego involvement and made public criticisms of a student's lack of effort.

Anne: The next brave individual...Tomi would be brave, but he hasn't done it. You have not done your homework...You have been sitting there and have been doing nothing and haven't done your homework. That doesn't mean that you can stay there slacking.

Student: Yeah but, I'm processing these things.

Anne: No, you have been processing these far too much. You have been processing since yesterday. Haven't you started at all doing it?

Student: I have to...but....

During this interaction, it was explicit that Anne created internal compulsions of shame to pressure him to act as expected, without giving him a chance to explain. The other students then looked at him, and some even laughed at him. Later, this student turned around and looked at the camera with an anxious look.

4.3.2. Episodes from Laura's Lessons

Regarding *Laura's English lesson in 7C*, first she introduced the vocabulary about school systems and classroom facilities. She then asked the students to complete the exercises in their textbooks. They were seated in small groups with three or four members in each group.

When Laura taught the English vocabulary about the school system in Finland, she provided an explanatory rationale for the importance of learning this vocabulary.

Laura: So, there are plenty of words to describe schools. Even though you know all the schools perfectly, still, when you go to Spain, you have to explain again what school you are in, what kind of school it is, your grade, how old you are, and what has happened there. That's just because school systems are different in every country. Those small words help you.

During this instruction, Laura pointed out the differences between the school systems in Finland and some foreign countries, and the importance of explaining these differences to foreigners if students went abroad. However, Laura then used controlling language to require students to use British words instead of American ones in their expression.

Laura: Your problem is that you watch a lot of American programs, I claim. But we are in Europe and Great Britain is closer to us, and that's why we should use British words.

During this instruction, Laura used controlling language with "should". She required students to use British words because Britain is closer to Finland than America, which did not sound a very convincing rationale. Laura also indicated that watching a lot of American TV programs was a problem that would hinder their use of British words. However, she did not ask about students' preferences for the use of words, nor did she offer them a choice.

The next illustrative example showed how fostering interest in learning helped with Laura's teaching. When she introduced the English vocabulary for classroom facilities, she created a word—"esiäiti" in Finnish—which derives from "isoäiti" (meaning "grandmother") to emphasize "esi" (meaning "pre") and help students better understand that touchscreens evolved from interactive whiteboards.

Laura: An interactive whiteboard is like the "esiäiti" of a touchscreen.

Student: Esiäiti, haha!

Laura: That word doesn't exist...What is it? How is it called?...This is its "esiäiti." It's evolved from....

Student: Now I know.

During this interaction, Laura's creative explanation assisted to foster students' curiosity in learning the relationship between touchscreens and interactive whiteboards. Her newly-created word seemed quite interesting to one student, and he was laughing happily when he finally understood the relationship between the two types of classroom facilities.

In the last section of the lesson, Laura asked students to complete the exercises in their textbooks, concerning interviews with peers about their schools, grades, and classes. The students worked in their own groups and took turns to ask and answer. Laura then used controlling language again to manage student behavior.

Laura: Hey, Lisa, have you done it? Concentrate on your role.

During this instruction, Laura used a directive to command one student to concentrate on her work. Although students' exercises involved interactive communication, she did not participate in their conversation, nor give any comments. Her teaching role focused on examining students' learning tasks and ensured that everybody had completed them.

Regarding *Laura's English lesson in 8C*, she first asked students to use iPads to find the website and complete the exercises concerning English vocabulary and grammar. She then helped to solve students' problems during the exercises, and also managed their behaviors to ensure the completion of the tasks. The students were seated in small groups with three or four members in each group. During this lesson, she emphasized several times that students could choose the exercises they wanted to complete.

Laura: Choose a bit what you are going to do. Work with your iPads...Either you do those Sanoma Pro exercises...or then you can go to Quizlet.... So, go either to the site Sanomapro.fi or... That is now this Sanoma Pro...and the other one is Quizlet...Yes, you can choose from all the exercises, they are a bit different there... Even though there are terribly many, check which ones are beneficial to you.

Besides providing options for students' exercises, she also asked about students' preferences for activities in the coming lesson.

Laura: And then we will do something fun during the class next week. Is there something you would like to do?

As discussed previously in the literature review, both examples of options concerned procedural and organizational choices, in other words, the procedure for the lesson and the layout of the coming lesson. Nevertheless, no cognitive choices concerning student independent opinions about the learning content were found. Laura did not show any pedagogical design that could facilitate students' deep learning of English vocabulary and grammar through completing the exercises. The whole lesson only involved doing exercises and her checking students' exercises. There was no discussion about specific learning content, so no cognitive choices for students were provided.

During the lesson, a student requested the right to go to the toilet because it was Children's Day, but Laura used conditional regard to respond to the student's request.

Student: So, we should all have the right to go to the toilet during class.

Laura: If you empty your pockets, you may go to the toilet during class.

In this statement, she made it explicit that they would be allowed to go only if they emptied their pockets and took out their cellphones. Her conditional regard or permission to go to the toilet indirectly controlled student behaviors. However, her controlling strategy might hurt students' self-esteem.

Apart from using conditional regard, she also created ego involvement to stop a student wearing a hood. She took off his hood and, at the same time, connected his behavior to his hairdresser.

Laura: Your hairdresser would have worked for nothing if you had your hood over your head.

In Laura's controlling behavior, she might create internal feelings of shame with this student indirectly, although he had not displayed any disruptive behavior in the classroom.

At the end of the lesson, she employed controlling teaching very intensively, as displayed previously in Figure 2. First, she rejected students' negative affect about the length of the lesson. She had a disagreement with her students about the time to end the lesson. Finally, she announced that time ought to be based on her clock, using an authoritarian power assertion. However, the students rebelled against her power.

Laura: You have five minutes left, actually four. Use them well.

Student: Three.

Laura: Shh...my clock wins.

Student: No, it doesn't.

After this negative interaction between her and the students, she continued using controlling language to pressure them to comply with her directives. However, her commands were not effective because many students showed passivity towards the learning activity and started chatting or packing. She had to repeat her commands several times, and finally complained, "It starts to get a bit out of hand." It was explicit that her repetitive commands could not control students' behaviors.

Laura: Janne, do exercises. Hey, Sampo, Tomi, and Pasi...Mmm, Janne, Kimmo, some action...Er, Janne...Eerikki...Discuss it in English...Eerikki, you concentrate on your own work...Janne, the same goes for you...Don't pack your stuff yet. (with an annoyed tone)

5. Discussion

The present study found that teachers employed both autonomy-supportive and controlling teaching during the same lesson, and even combined them in the same instructional sequence. This finding is consistent with the increasing recognition in SDT that controlling teaching cannot be simply equated with the absence of autonomy support [26,53], because the use of autonomy support and control may not be two sides of the same coin, or a simple all-or-none question [54]. More evidence from the present study to support the complexity of the adoption of autonomy support and control was that using autonomy-supportive and controlling strategies was contingent on different contexts and showed intra-individual differences. For example, Laura adopted controlling strategies more intensively in her own homeroom class 8C than in 7C. Compared to 7C, she had more responsibility and accountability for students' safety, wellbeing, and behaviors and contact with their parents in 8C. This responsibility and accountability in terms of external forces (e.g., administrators and parents) might be one of the factors connected with her tendency to teach in a more controlling way in one class than another [5]. In addition, Laura displayed more controlling strategies than Anne during teaching. As a novice teacher, Laura might not have constructed systematic teaching strategies, compared to Anne, who was a veteran teacher. However, as an experienced teacher, Anne was also found employing indirect control, such as shaming students in public and combining ego involvement with explanatory rationales in the same instructional sequence. Thus, regardless of teaching responsibilities or experience, both teachers employed autonomy support and control to different extents during instruction. Unlike a previous study that classified teachers into two types and argued that what autonomy-supportive teachers say and do contrasts with controlling teachers [55], the present study suggested that one should remain cautious about labeling teachers as autonomy-supportive or controlling. It may be more realistic and meaningful to identify and interpret teachers' autonomy-supportive and controlling behaviors based on analysis of specific contexts. How contextual aspects may affect the adoption of autonomy-supportive or controlling teaching needs to be systematically examined in future research.

A novel finding from this study was that error tolerance can be considered a category of teachers' autonomy-supportive behaviors. Prior studies have emphasized that positive teacher attitudes toward student errors can foster a positive error climate, which involves treating errors as learning opportunities, encouraging students to discuss their misconceptions, and not ridiculing students when they make an error [52]. Moreover, students who believe that they will not be ridiculed when they make a mistake have been found to be more likely to communicate their misconceptions with teachers [56]. In the present study, Anne showed a positive attitude toward students' mistakes, as she emphasized "it doesn't matter" if they made mistakes because they were still practicing. This attitude may encourage students to treat mistakes as learning opportunities and discuss their mistakes openly. Anne also displayed patience while listening to a student explain why she made a mistake without displaying any annoyance or ridiculing the student. A previous

study also found that students express more positive affective reactions (e.g., enjoyment) when teachers give them time to think about the correct answer by themselves than when they correct the mistake for them, redirect it to another student, or ask the whole class to find the right solution [50]. In the present study, Anne also provided the opportunity for a student to correct his mistake. Her support for the student's self-correction may have helped to diminish his negative affective responses, because he may have felt more shame if she had corrected the mistake for him, or asked others to correct it on his behalf. Nevertheless, no prior study has explored error tolerance from the perspective of autonomy support. Error tolerance is important to understand in light of autonomy support, since it reflects two elements of autonomy support: encouraging students' self-regulated learning and integrating student perspectives into teaching [8]. First, guiding students to correct a mistake by themselves rather than correcting it for them involves encouraging students' self-regulated learning. Second, taking into account their affect (e.g., anxiety) without ridiculing them in this process entails integrating student perspectives into teaching. Therefore, error tolerance can be considered another category of teachers' autonomy-supportive behaviors.

Another novel finding from this study was that teachers' creativity was used to support students' autonomy. Laura created a Finnish word which does not exist when she introduced the English vocabulary of classroom facilities. Her creativity appeared quite interesting to students and aroused their curiosity in the relationship between touchscreens and interactive whiteboards. Moreover, one student was laughing happily when he finally understood the relationship between the two types of classroom facilities. Therefore, Laura's teaching creatively was coded as fostering interest in learning, a category of autonomy support. Teaching creatively [57], that is, using imaginative approaches to make learning more interesting and effective, has become an imperative topic for policy makers, researchers, schools, and teachers globally [58]. However, a previous systematic review of literature has suggested that there is a call for more robust evidence to support how teachers' creativity can be promoted [59]. Moreover, to our knowledge, teachers' creativity or teaching creatively has rarely been integrated into research on teachers' autonomy support. Thus, teachers' creativity, especially in light of autonomy support, needs greater attention in future research.

Furthermore, this study found that teachers employed indirect controlling teaching strategies, including creating ego involvement and conditional regard. Similarly to indirect control, prior studies in the parenting literature have investigated the concept of psychological control, which involves tactics such as guilt induction, shaming, love withdrawal, or contingent support to manipulate adolescents' thinking processes, emotions, and attachment to parents [60,61]. In this sense, the indirect controlling strategies found in this study regarding teaching in the classroom could be linked to psychological control in parenting, because guilt induction, shaming, and contingent support were also used by the teachers in this study. For example, both teachers created internal compulsions of guilt or shame to motivate students to raise their hands, to make more effort in finishing homework, or to remove a hood. Laura also showed that her support for students (e.g., permission to go to the toilet) would depend on whether they emptied their pockets by taking out their cellphones. In light of evidence that parental psychological control is consistently predictive of depression in young people [60], the present study also found that the student who was publicly criticized by Anne for not completing his homework turned around and looked anxiously at the camera after being laughed at by his classmates. Therefore, indirect control and its effects on students' learning and well-being in classroom contexts should arouse more concern in future research.

This study also found that controlling language was used intensively at the end of the lesson to pressure students into compliance. Laura used not only "should" and "have to", but also directives or commands to request students to concentrate on their tasks, use their time well, and even for one student to take off his hood. Notably, she used commands with 8C intensively towards the end of the lesson to maintain classroom management. However, the high frequency of her commands did not appear effective in adjusting student passivity towards the learning activity. Eventually, her tone of statements sounded increasingly annoyed, but students did not show compliance with her

commands. The use of controlling language by Laura may manifest a reaction to student passivity during learning activities, with the expectation that this teaching strategy could directly and quickly produce a desired outcome [5]. However, previous research has found that controlling language leads to student amotivation intertwined with anger and anxiety [7]. The present study showed that the more frequently Laura used controlling language, the more students displayed non-compliance, and the more Laura reacted to their disciplinary problems with controlling language. This cycle suggests that controlling language may not quickly and directly produce the desired outcome that teachers expect. Rather, using controlling language may muddy the issue. Regarding reactions to unexpected student behavior, Anne's strategies were different from Laura's. In response to a student's complaint about listing Finnish indefinite pronouns, Anne first acknowledged that this activity was difficult, and then explained that its purpose was to help them identify and classify personal pronouns by heart. The findings of this study suggest that teachers need to acknowledge student negative affect and provide explanatory rationales for expected student behaviors rather than simply using controlling language.

6. Conclusions

The present study explored teachers' autonomy support and control through video analysis of two teachers' lessons, providing a situated perspective that enabled micro-level interpretations of teacher and student interactions [62]. Elaborated interpretations of classroom examples of autonomy-supportive and controlling teaching have also been provided, so that readers may determine whether the findings from this case study can be extrapolated to similar cases. This study found that teachers may employ both autonomy support and control to different extents, and that the use of autonomy support and control may be contingent on different contexts. The novel contributions of this study are that teachers show error tolerance and creativity to support students' autonomy. Showing error tolerance and teaching creatively have not been investigated from the perspective of autonomy support in previous research.

The educational implications of the present study are four-fold. First, due to the complexity of the use of autonomy support and control, teachers need to self-examine under which circumstances and to what extent they employ autonomy support and control. Second, showing error tolerance and teaching creatively should be included and emphasized in teacher training programs concerning autonomy support. Third, more attention ought to be paid to indirect control, including creating ego involvement and conditional regard, as well as their negative effects on learning and well-being. Fourth, the practical examples of autonomy support and control in the classroom provided in this study could facilitate in-service or novice teachers to self-reflect on the motivational strategies they employ.

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