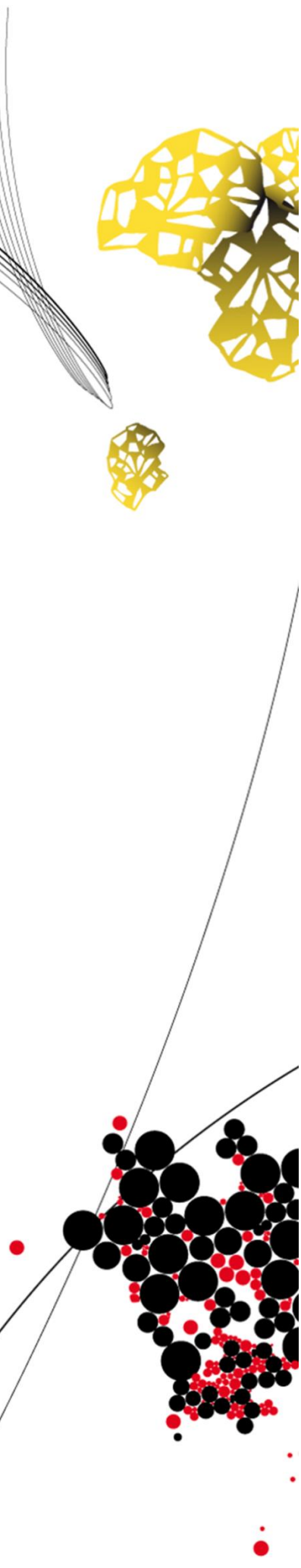

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Committing to organizational change: A conscious or unconscious occurrence?

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Abstract

Organizations need to implement change to remain future proof. Employee commitment is considered important to achieve this. This experimental research tested the assumption that eliciting commitment to change amongst teachers occurs in a conscious manner. The between subjects design, focused on the extent commitment to change of primary school teachers is influenced by the priming effect of anchoring, when controlling for the habit of using the change. Commitment to two educational changes were analyzed by considering affective, normative and continuance commitment. Two teacher groups were primed in a survey with a low or high anchor. The control group was not primed. Furthermore, the influence of individual factors (job satisfaction, work experience, gender) on the anchoring effect was investigated (solely low and high anchor group). Quantitative results were analyzed using ANOVAs, MANCOVAs and two-way MANOVAs. Despite hypothesized, the anchoring effect did not occur while controlling for habit: no differences in commitment to change were found between the three conditions. When solely comparing the low and high anchor condition, anchoring occurred for males on normative commitment to one educational change. No other individual differences influenced the anchored commitment to change. It is suggested that similar research is replicated in the future and that the assumption underlying this study, that an anchor value automatically and unconsciously influences someone's way of thinking, is tested. This study contributes to organizational, psychological and educational science, by making a first step to close the knowledge gap on the influence of the anchoring effect on commitment to change.

Keywords: anchoring, commitment to change, priming, three-component model, organizational change.

Committing to Change: A Conscious or Unconscious occurrence?

As the world is constantly changing, so are educational policies and schools. After the second world war, Dutch educational policy makers have been re-organizing primary and secondary education each decade (Dekkers & Evrengun, 2002). As an illustration, Dutch secondary education was reformed in 1999 ('Studiehuis en tweede fase', 2007) and followed by another restructuring eight years later. A recent example is the project 'Curriculum.nu', which provided a report late 2019 about the reforming of both primary and secondary curricula. Organizational reforms in schools are often an answer to changes in the world in order to make education more future proof and improve its quality ('Over Curriculum.nu', 2018; Sleegers & Leithwood, 2010).

Organizational reforms, such as in the aforementioned examples, can generate uncertainty amongst employees that might lead to resistance (Bordia et al. 2004). When faced with organizational change, employees develop uncertainties about a vast number of topics. As an illustration Schweiger and Denisi (1991) found 21 topics employees felt uncertain about when faced with change, such as uncertainty about a potential increase of work pressure and uncertainty about taking on a new responsibility. Bordia et al. (2004) state that this is especially apparent when it is difficult to predict how the change will influence someone's job, for example due to vagueness or unclear and contradicting information. Feelings of job-uncertainty were found to be negatively associated with commitment (Hui & Lee, 2000). Uncertainty appears to generate a feeling of not being in control, which in turn causes feelings of stress (Bordia et al., 2004). As this is not considered a pleasant state of mind, employees will seek active ways to increase control, for example by resisting change (Bordia et al., 2004; Hui & Lee, 2000). In all, it should be noted that uncertainty about change, might lead to resistance towards the change. This can restrain a successful implementation of organizational reforms.

Paradoxically, the commitment of employees is presumably one of the most important factors to safeguard a positive outcome of organizational change (Herscovitch & Meyer, 2002). Based on a meta-analysis of several studies on commitment to change, Bouckenooghe, Schwarz and Minbashian (2015) state that commitment towards organizational change, plays an important role in explaining behavioral support to change. So, since commitment to change of employees is important to ensure a successful implementation of change (Sleegers & Leithwood, 2010), but simultaneously is likely to decrease due to uncertainty in change trajectories (Bordia et al., 2004; Hui & Lee, 2000), organizations should take extra measures to safeguard and enhance it.

Despite the importance of commitment of employees towards organizational change, little is known on how it is elicited (Sleegers & Leithwood, 2010). The explanation on how employees commit to change seems to differ between scholars in educational- and psychological science. In educational science it is argued that teachers make relatively conscious and quick decisions whether to commit to an educational change (Doyle & Ponder, 1977; Reid, 2014). The findings indicate that when teachers are informed properly, they will commit to the change presented. Within the domain of psychology, scholars also study which strategies people use when making decisions, which is referred to as *heuristics* (Tversky & Kahneman, 1974). In contrast to educational science, psychologists acknowledge that people are biased when making decisions, and that stimuli can unconsciously affect subsequent behavior, which is referred to as *priming* (Newell & Shanks, 2014). This research is set out to challenge the vision of educational scholars that teachers consciously decide to commit to educational change.

A way to evoke bias in decision making is through the *anchoring effect*. Anchoring is a specific type of priming (Newell & Shanks, 2014)**.** In anchoring initial information is offered. For example, when asking a person whether the University of Twente has more or less students than 11.000, the anchor provided is the number ‘11.000’. The person assessing the anchor, will start from

this initial offered information and subsequently adjust in order to make a decision. Different anchors lead to different estimates, which are biased in the direction of the offered anchor. This phenomenon is called the anchoring effect or shortly referred to as anchoring (Tversky & Kahneman, 1974).

Anchoring might also unconsciously influence people when deciding to commit to organizational change. This could cause a risk to the quality of the assessment made by a person, when the anchor information appears to be incorrect (Caputo, 2014). As an illustration, a teacher might have heard or read that applying 21st century skills in class increases work pressure of teachers with 2.5 hours per week (the anchor). When the school subsequently introduces 21st century skills in class, the teacher might unconsciously feel less willing to commit to the change, despite the anchor value of 2.5 hours being incorrect or outdated. It is therefore conceptually reasonable to expect that anchoring influences commitment to change (Delfabbro, Burns & Begg, 2014; Furnham & Boo, 2011; Furnham, Boo & McClelland, 2012; Mussweiler, 2001; Newell & Shanks, 2014; Welsh, Delfabbro, Burns & Begg, 2014). However, to the author's knowledge, the influence of anchoring on the commitment to change of employees has not been investigated by scholars before. This study is set out to close this gap.

This study will contribute to organizational change research by combining constructs from educational and psychological science. From educational research the theory on teachers' quick decision making from Doyle and Ponder (1977) will be employed. From psychological science the priming effect of anchoring will be utilized (Tversky & Kahneman, 1974), as well as the theory on the importance of commitment to change (Herscovitch & Meyer, 2002). The focus of the study will be on the extent that the priming type of 'anchoring' impacts Dutch primary school teachers to commit to the implementation of change initiatives in education. Ultimately, this study challenges the vision of Doyle and Ponder (1977) on teacher decision making towards educational change, by investigating whether teachers can also commit to change in an unconscious manner. Moreover, as

the sensitivity to the anchoring effect appears to differ among individuals (Furnham et al., 2012; Hügelschäfer & Achtziger, 2013; Kudryavtsev & Cohen, 2011; Northcraft & Neale, 1987; Welsh et al. 2014), the effect of job satisfaction, work experience, and gender on anchoring will be investigated. Practically, organizations such as schools will be able to use the information of this study when implementing organizational change. It will allow organizations to choose a change strategy that is adjusted to, and aligned with, how employees commit to change. This may increase the likeliness that change initiatives are implemented successfully.

Theoretical Framework

Commitment to Change

Commitment can be defined as the dedication a person has to take actions in order to fulfill one or multiple goals (Herscovitch & Meyer, 2002). Herscovitch and Meyer (2002) defined the three-component model of commitment to organizational change which exists of *affective commitment, continuance commitment* and *normative commitment*. Affective commitment can be explained as the extent to which a person wants to support the change. Continuance commitment is characterized by a person's feeling that he needs to change in order to prevent failure. An extreme example would be an individual that does not support the change but does participate anyway in order to secure his job. Finally, normative commitment is when a person supports the change because he feels a sense of obligation to do so. Solely when a person scores low on all of these three commitment categories, this is considered as resistance towards the change as that person will most likely not comply with the change (Herscovitch & Meyer, 2002). The three-component model thus provides the opportunity to perform in depth analyses about commitment towards organizational change.

Empirical evidence supports the three-component model (Bouckenooghe et al., 2015; Herscovitch & Meyer, 2002). Despite being related, the three types of commitment can be

distinguished from each other. All three commitment types are positive predictors of the behavioral support for change (Bouckenooghe et al., 2015; Herscovitch & Meyer, 2002). Furthermore, people with high levels of affective commitment and normative commitment, also show high levels of behavioral support, such as cooperation and showing extra effort (Herscovitch & Meyer, 2002). Based on these findings, teachers who report to be committed might also show more behavioral support to organizational changes.

Eliciting Commitment to Change

This study is set out to challenge the assumption of Doyle and Ponder (1977) who argue that teachers consciously make decisions about whether to commit to an educational change based on its *practicality*. In order to assess whether a new initiative is practical, teachers are believed to base their decision on three dimensions (Doyle & Ponder, 1977). Firstly, *instrumentality,* which means that a change should provide clear and concrete clues for application in class. Secondly, teachers assess the *congruence* of the change with their own situation. This relates to the content of the change, the origin of the change, teachers' self-image and vision on students. Finally, a teacher considers the return of the time investment and effort he must make, which is referred to as *costs* (Doyle & Ponder, 1977). The literature review of Reid (2014) shows that the introduction of the idea that teachers commit to an educational change based on its practicality, had quite an impact on scholars in educational science as it has been employed in several studies. In all, Doyle and Ponder (1977), thus argue that teachers make (a) a conscious, and (b) a rational choice to commit to an educational change based on their assessment of the practicality of the change.

Insights from psychology offer clues that indicate that the commitment of employees to change might be elicited in an unconscious manner, through the priming effect of anchoring. Anchoring occurs when an individual makes a decision, while relying too much on prior offered

information (the anchor). Firstly, a clue is that the three most common models that attempt to explain the underlying information processing in anchoring share the believe that anchoring can be a process that is unintentional and automatic (Newell & Shanks, 2014; Strack & Mussweiler, 1997; Tversky & Kahneman, 1974; Wegener, Petty, Blankenship & Detweiler-Bedell, 2010). Since the 70's, scholars found the anchoring effect to be robust in several tasks, groups and situations (e.g. Delfabbro et al., 2014; Furnham & Boo, 2011; Furnham et al., 2012; Mussweiler, 2001; Welsh et al., 2014), which is why commitment to change might potentially also be influenced by anchoring. Secondly, it was found that anchoring can influence decisions made over time. As an illustration, Mussweiler (2001) found that anchoring biased the assessment of persons one week later. This indicates that teachers' commitment to change might also be unconsciously influenced by anchoring based on information offered to them in the past. In conclusion, there are scientific clues that teachers might be primed to commit to change in an unconscious manner through anchoring.

However, teachers that are familiar with a specific educational change initiative, are expected to be less influenced by anchoring than teachers who are unfamiliar with the change. When being familiar with a specific change, one is expected to unintentionally dismiss the anchor value sooner, and provide an assessment based on the true value of the change (Smith, Windschitl & Bruchmann, 2013; Welsh et al., 2014). This study will therefore control for the familiarity of participants with the educational change initiatives and operationalized this as *habit*. A habit is the order of behavior that is triggered automatically when confronted with certain cues and has a function to reach goals or targets (Verplanken & Aarts, 1999). As an illustration, a primary school teacher that is used to differentiate between children will automatically provide different attention to a child that has difficulties with math than to a child that is doing very well in math. Based on the aforementioned theory, the first hypothesis has been formed.

H1. Anchoring has an effect on Dutch primary school teachers' affective, continuance and normative commitment to implement educational change initiatives when controlling for the habit of using these changes. Moreover, there is a difference in the level of commitment to change when priming the low or the high anchor.

Sensitivity to the Anchoring Effect

Scholars have investigated several factors that influence the sensitivity of individuals to the anchoring effect (Furnham et al., 2012; Hügelschäfer & Achtziger, 2013; Kudryavtsev & Cohen, 2011; Northcraft & Neale, 1987; Welsh et al. 2014). Nevertheless, researchers have not yet succeeded to identify variables that systematically influence anchor judgments (Furnham & Boo, 2011), hence why more research is needed. In eliciting commitment towards organizational change, the level of sensitivity to the anchoring effect might also differ per individual. Individual factors considered in this study are job satisfaction, work experience, and gender.

Firstly, *job satisfaction* might influence the anchoring bias. Job satisfaction can be defined as the feeling of fulfillment one gets when performing work tasks (Klassen & Chiu, 2010). Both job satisfaction and someone's mood refer to a person's emotions. The influence of job satisfaction on the anchoring effect was not investigated before, but someone's mood has been found to affect anchoring (Englich & Soder, 2009; Furnham & Boo, 2011). The *Selective Accessibility Model* attempts to explain the underlying mechanism of anchoring and might also explain why being in a sad mood increases the influence of the anchoring effect. According to Strack and Mussweiler (1997) the following occurs: during anchoring the hypothesis is tested whether the provided information (the anchor) is consistent with previous generated knowledge by the person. This knowledge is, however, not representatively retrieved from the memory, but selectively activated, under the influence of the anchor. So, in anchoring, while searching for a final answer, a person will look for previously gained knowledge that is consistent with the anchor information (Strack & Mussweiler, 1997). Being in a

sad mood is considered to lead to a more careful consideration of the anchor information than when being in a happy mood, which in turn leads to a more extensive search of anchor-consistent knowledge, setting the anchor mechanism in motion (Englich & Soder, 2009; Furnham & Boo, 2011). In all, when feeling unsatisfied or sad, this might increase the influence of the anchoring effect, while feeling satisfied or in a positive mood might decrease the influence of the anchoring effect (Englich & Soder, 2009). The second hypothesis in this study therefore is:

H2. For Dutch primary school teachers in the anchoring conditions, the relationship between anchoring and commitment to change is stronger for teachers who are unsatisfied than for teachers who are satisfied about their jobs.

Secondly, the years of work experience an individual has might cause a difference in the sensitivity towards anchoring. Teachers can be categorized as novices when they have less than three years of work experience and as expert teachers when they have three or more years of work experience (Tschannen-Moran & Woolfolk Hoy, 2007). A novice teacher might have less insight into what an educational change entails and what the impact is on day-to-day work than expert teachers, who have more work experience and therefore more practical experience with organizational changes. So due to the increased understanding of expert teachers about organizational changes, gained throughout their career, they might have a better understanding of the true value of an anchor than novice teachers. This may lead expert teachers to ignore the anchor value, and instead, provide an assessment that is closer to the correct value (Smith et al., 2013; Welsh et al., 2014). Therefore, the third hypothesis is:

H3. For Dutch primary school teachers in the anchoring conditions, the relationship between anchoring and commitment to change is less strong amongst teachers that have more work experience than teachers that have little work experience.

Finally, gender is a factor that might affect the anchor bias. Several scholars found women to be influenced more by the anchoring effect than men (e.g. Hügelschäfer & Achtziger, 2013; Kudryavtsev & Cohen, 2011; Welsh et al., 2014). Based on their literature study, Kudryavetsey and Cohen (2011), provide two possible explanations for this finding. Firstly, women show higher levels of collaboration and willingness to follow others than men. This may make women more sensitive to follow the presented anchor value if the anchor value is offered to them by someone other than themselves. Men, less interested in following others, are therefore believed to more easily dismiss the anchor provided to them (Kudryavtsev & Cohen, 2011). Secondly, women seem to be more focused on details and subtleties, which might activate the anchor mechanism more, simply because they take more notion of the anchor value than men. While in contrast, men are considered global thinkers that take more risks, leading to the anchor value being ignored (Kudryavtsev & Cohen, 2011). The final hypothesis of this study is:

H4. For Dutch primary school teachers in the anchoring conditions, the relationship between anchoring and commitment to change is stronger for female teachers than for male teachers.

Method

Design

To test the four hypotheses, this study employed an experimental between-subjects design, with the anchor as the independent variable and commitment to change as the dependent variable. The independent variable consisted of two levels, namely the presence of a low anchor or the presence of a high anchor. In the control condition no anchor was provided. Commitment to change was assessed for participants in all conditions on three levels (affective, normative and continuance commitment to change). Moreover, it was measured twice per participant, namely for two change scenarios (differentiation and 21st century skills). As the variable 'habit of using the change initiatives' was expected to be significantly related to the dependent variable (commitment to

change), it was used as a control variable to test hypothesis one. Variables used to test the sensitivity to the anchoring effect on commitment to change were job satisfaction, work experience and gender.

Participants

The study was conducted at 72 primary schools in the Netherlands, selected through convenience sampling: schools that are easy to reach and available (Dooley, 2009). After excluding school heads and other personnel, which were not part of the target group of this study, the total sample consisted of 246 teachers (229 female and 17 male). The mean age of the teachers was 42 (*SD* = 12.37). The majority of the teachers that participated in the study finalized a bachelor's degree (69%) or a professional master (26%). Other teachers finalized a master's (3%) or a vocational degree (2%). Teachers, on average, had 18.2 years (*SD* = 12.35) of work experience. Most teachers were thus categorized as expert teachers (Tschannen-Moran & Woolfolk Hoy, 2007), with a mean of 1.94 (*SD* = 0.24). In terms of job satisfaction, the average score was 7.85 (*SD* = 0.72) on a scale from 0 to 10. The approached teachers were randomly assigned to the three conditions. This was done automatically by the software. 79 teachers participated in the control condition, 79 teachers participated in the low anchor condition, and 88 participated in the high anchor condition. All teachers voluntarily participated in the experiment.

Procedure

Teachers of the selected schools were contacted through email. In the email they were requested to click on a link to the digital online survey (Qualtrics). Teacher had to fill in demographic related questions and were then randomly and automatically assigned to the three conditions, namely the positive anchor, the negative anchor or no anchor.

For each condition, the survey would either start with questions about the change scenario 'stimulation of 21st century skills' and end with the change scenario 'differentiation in education' or vice versa, to control for the order effect (Dooley, 2009). For all three conditions the structure of the

survey was identical, namely: (a) questions about demographics, (b) questions about the habit of using one of the change initiatives, (c) a scenario description regarding the change initiative, (d) the presence or absence of the manipulation (e) ranking the change initiative, (f) and finally questions about the commitment towards the change. Then the same structure would follow for the other change initiative, starting with the questions about the habit of using the change initiative.

The manipulation existed of either a high or a low anchor. After reading the scenario the participants were asked to indicate on a scale from 0 to 10 how valuable they rated the educational change for education. In the high anchor group, the participants were asked to consider whether their answer should be higher or lower than 7.1. This anchor should promote teachers to be positive about the educational change. In the low anchor group, the participants were asked to consider whether their answer should be higher or lower than 4.9. This anchor should discourage teachers regarding the educational change. For participants in the control condition, no anchor was provided.

At the end of the survey the participants were explained what the purpose of the survey was and were thanked for their participation. For questions, the participants were referred to the researcher of the study.

Instruments

The instrument used in this experiment is a survey. The survey in this study has been constructed using several scientific questionnaires and models. The two scenarios on educational changes were written to meet the three criteria of practicality (Doyle & Ponder, 1977). To measure the habit of using the two change initiatives, the Self-Reported Habit Index questionnaire of Verplanken and Orbell (2003) has been adopted. The questionnaire from Herscovitch and Meyer (2002) was adopted to measure affective, normative and continuance commitment for the two educational changes. A factor analysis was conducted for each educational change (differentiation and 21st century skills) using factoring analysis with oblique rotation, with a fixed number of 4 factors

(see Table 1 and Table 2) explaining 57.98% of the variance for differentiation and 53.66% for 21st century skills.

The scenarios. The two scenarios employed in the survey were written to portray a high level of practicality (Doyle & Ponder, 1977). As an illustration, the instrumentality of the change was stressed by stating that 'the stimulation of 21st century skills are easier than often thought. In principle, you can apply it in class immediately!'. The congruence of the change was pointed out by explaining more about the origin of the change, e.g. why the 21st century skills are getting more attention in education. And finally, the costs were made clear by stating that teachers do not report higher levels of work pressure when applying the educational change, and students perform better on their final exams. Both the differentiation as the 21st century skills scenario was pilot tested by two experts in the field.

Habit. The habit of using the educational change initiatives was measured through self-reporting, with 12 items (Verplanken & Orbell, 2003). An example of one item is, 'differentiation between my students is something I do automatically'. Participants could rate to what extent they agreed with the statements on a five-point Likert scale from 1 (*totally disagree*) to 5 (*totally agree*). The reliability of the habit questionnaire was measured with Cronbach's alpha, which showed a = .927 for 21st century skills and a = .944 for differentiation. This means that both the reliability of the questionnaire on the habit of working with 21st century skills and the reliability of the questionnaire on the habit of working with differentiation were very good.

Commitment to change. The commitment of teachers towards the organizational changes were measured through self-reporting, using the questions from the three-component model of commitment of Herscovitch and Meyer (2002). The questionnaire existed of 18 items, of which six were related to each component, namely: Affective commitment, normative commitment and

Table 1
Factor Loadings Resulting from a Principal Axis Factoring, using Oblique Rotation, for the Questions on Differentiation (N = 246)

	Factor loadings			
Item	Habit	Affective commitment	Continuance commitment	Normative commitment
Differentiating between my students is something I do without having to consciously remember.	**.86**	-.00	-.02	-.01
Differentiating between my students is something I do that belongs to my daily routine.	**.85**	.07	.02	.05
Differentiating between my students is something I do automatically.	**.83**	.03	.02	.03
Differentiating between my students is something that's typically 'me'.	**.82**	.03	.02	.03
Differentiating between my students is something I do without thinking.	**.82**	-.06	.01	.06
Differentiating between my students is something I would find hard not to do.	**.80**	-.11	-.01	-.07
Differentiating between my students is something I start doing before I realize I'm doing it.	**.80**	-.05	-.01	-.02
Differentiating between my students is something that would require effort not to do it.	**.77**	-.07	.03	-.00
Differentiating between my students is something I have been doing for a long time.	**.75**	.06	.01	.02
Differentiating between my students is something I have no need to think about doing.	**.72**	-.03	-.04	-.04
Differentiating between my students is something that makes me feel weird if I do not do it.	**.71**	.08	-.07	-.06
Differentiating between my students is something I do frequently.	**.52**	.27	.03	.03
The differentiation between my students serves an important purpose.	-.02	**.73**	-.09	-.19
I believe in the value of differentiating between my students.	.13	**.71**	-.02	-.15
The stimulation of differentiating between my students is a good strategy for our school.	.09	**.71**	.04	-.09
It is not necessary to differentiate between my students.	.12	**.57**	-.26	-.04
Things would be better if I would not differentiate between my students.	.16	**.45**	-.27	-.03
I think that our management is making a mistake by stimulating differentiation between my students.	-.09	**.44**	-.18	.02
I have too much at stake to resist differentiation between my students.	.03	-.02	**.79**	.01
It would be too costly for me to resist the differentiation between my students.	-.02	.02	**.77**	.02
It would be risky to speak out against differentiation between my students.	.03	-.01	**.63**	-.10
I feel pressure to go along in the differentiation between my students.	-.14	-.05	**.60**	-.05
I have no choice: I have to go along in differentiating between my students.	.05	.02	**.38**	-.29
Resisting differentiating between my students is not a viable option for me.	-.04	.08	.15	**-.68**
I would be irresponsible of me to resist differentiation between my students.	-.07	-.03	-.15	**-.85**
I would feel guilty about opposing to differentiate between my students.	.02	.01	-.08	**-.79**
I do not think it would be right of me to oppose on differentiating between my students.	-.04	.08	.15	**-.68**
I feel a sense of duty to differentiate between my students.	.06	.09	.24	**-.56**
I would not feel badly about opposing to differentiate between my students.	.03	**.36**	.08	.10
I do not feel any obligation to support differentiation between my students.	-.02	.25	.10	-.01
Eigenvalues	8.88	2.75	4.15	1.60
% of explained Variance	29.61	9.17	13.85	5.35

Note. Factor loadings over .30 appear in boldface.

Table 2

Factor Loadings Resulting from a Principal Axis Factoring, using Oblique Rotation, for the Questions on 21st Century Skills (N = 246)

	Factor loadings			
Item	Habit	Affective commitment	Continuance commitment	Normative commitment
Stimulating 21st century skills of my students is something I do without thinking.	**.85**	-.05	.11	.14
Stimulating 21st century skills of my students is something I do without having to consciously remember.	**.82**	-.02	.07	.06
Stimulating 21st century skills of my students is something I do automatically.	**.81**	-.03	-.01	.03
Stimulating 21st century skills of my students is something I start doing before I realize I'm doing it.	**.79**	-.12	.11	.03
Stimulating 21st century skills of my students is something I do that belongs to my daily routine.	**.78**	.08	-.01	.06
Stimulating 21st century skills of my students is something I have no need to think about doing.	**.73**	.02	-.10	-.07
Stimulating 21st century skills of my students is something that would require effort not to do it.	**.70**	-.06	-.07	-.05
Stimulating 21st century skills of my students is something I would find hard not to do.	**.68**	-.10	-.02	-.05
Stimulating 21st century skills of my students is something that's typically 'me'.	**.68**	-.14	-.02	-.06
Stimulating 21st century skills of my students is something I have been doing for a long time.	**.64**	.00	.09	-.03
Stimulating 21st century skills of my students is something I do frequently.	**.58**	.07	.05	.02
Stimulating 21st century skills of my students is something that makes me feel weird if I do not do it.	**.45**	.04	.06	-.12
It is not necessary to stimulate 21st century learning of my students.	.06	**.75**	-.09	.11
I think that our management is making a mistake by stimulating 21st century skills of my students.	-.02	**.57**	-.16	-.03
Things would be better if I would not stimulate 21st century skills of my students.	-.05	**.57**	-.24	-.05
The stimulation of 21st century skills of my students serves an important purpose.	.16	**.51**	-.07	**-.35**
I believe in the value of stimulating 21st century skills of my students.	.23	.24	-.14	**-.45**
The stimulation of 21st century skills of my students is a good strategy for our school.	.16	.24	-.25	**-.41**
I have too much at stake to resist stimulating 21st century skills of my students.	-.02	-.07	**.74**	.14
It would be too costly for me to resist stimulating 21st century skills of my students.	.05	-.14	**.74**	-.04
It would be risky to speak out against stimulating 21st century skills of my students.	.04	-.08	**.69**	.03
I feel pressure to go along in stimulating 21st century skills of my students.	-.15	-.18	**.58**	-.17
I have no choice: I have to go along in stimulating 21st century skills of my students.	-.10	.09	**.43**	-.28
Resisting stimulating 21st century skills of my students is not a viable option for me.	.13	.22	**.42**	**-.32**
I would be irresponsible of me to resist stimulating 21st century learning skills.	.03	-.14	.04	**-.78**
I would feel guilty about opposing to stimulating 21st century learning skills.	.02	-.11	.05	**-.67**
I do not think it would be right of me to oppose on stimulating 21st century skills of my students.	-.03	.12	**.30**	**-.53**
I feel a sense of duty to work on stimulating 21st century learning skills of my students.	-.11	.14	**.31**	**-.47**
I do not feel any obligation to support stimulating 21st century learning skills.	-.04	**.34**	.04	-.09
I would not feel badly about opposing to stimulating 21st century learning skills.	.06	.24	.05	.14
Eigenvalues	7.52	3.15	4.04	1.39
% of explained Variance	25.07	10.50	13.46	4.63

Note. Factor loadings over .30 appear in boldface.

continuance commitment. Firstly, an example of a question measuring affective commitment towards 21st century skills is 'I believe in the value of stimulating 21st century skills of my students'. Secondly, an example of a question measuring normative commitment towards differentiation is 'I feel a duty to differentiate between my students.' Finally, a question measuring continuance commitment towards 21st century skills is 'I have too much at stake to resist stimulating 21st century skills of my students'. Participants could rate to what extent they agreed with the statements on a five-point Likert scale from 1 (*totally disagree*) to 5 (*totally agree*).

The reliability of the commitment to change questionnaire was measured with Cronbach's alpha, which showed for 21st century skills that affective commitment was a = .786, normative commitment was a = .626 and continuance commitment was a = .785. This means that for the questionnaire on 21st century skills the reliability of affective commitment was respectable, for normative commitment was slightly below acceptable and for continuance commitment was respectable also. For the commitment to change questionnaire on differentiation, Cronbach's alpha was a = .802 for affective commitment, a = .693 for normative commitment and a = .775 for continuance commitment. This means that for the questionnaire on differentiation, the reliability of affective commitment was very good, was minimally acceptable for normative commitment and was respectable for continuance commitment.

Data Analyses

The data was analyzed using the statistical software SPSS (23.0). To examine the coherence between the variables, descriptive statistics and correlations were collected. A one-way Analysis of Variance (ANOVA) was used twice to test if the low and high anchor values provided to the participants had a significant effect on the scoring of the educational changes. For hypotheses testing Multivariate Analysis of Covariances (MANCOVAs) were conducted followed by Bonferroni post hoc tests, as well as two-way Multivariate Analyses of Variances (MANOVAs). The level of

commitment, namely affective commitment, normative commitment and continuance commitment for differentiation and 21st century skills were used as dependent variables for all analyses. A significance level of $p < 0.5$ was employed.

Before conducting the MANCOVAs and two-way MANOVAs, the data and assumptions were checked. Subsequently assumptions of normality and linearity were tested. Furthermore, the assumption of homogeneity of regression slopes, variances and covariances were tested. Although not completely met, assumptions were considered as satisfactory enough to proceed with the MANCOVAs and two-way MANOVAs.

MANCOVAs were performed twice, one for each change, to examine differences between the low anchor, high anchor and control condition group while controlling for the habit of using the educational change (H1). In addition, Bonferroni post hoc tests were conducted to examine whether there were differences between one or more of the groups, while controlling for the habit of using the educational change. To test the other hypotheses (H2, H3, H4), two-way MANOVAs were employed. The habit of using the educational changes was thus not kept constant. Since hypotheses two, three and four focus on the sensitivity of participants on anchoring, solely data of the low anchor and high anchor groups were considered, as the control condition group was not exposed to an anchor value.

For the second hypothesis (H2) the factor variable of anchoring and job satisfaction were employed in the two-way MANOVAs. For the third hypothesis (H3) the factor variable of work experience was investigated in addition to the anchoring factor. For the independent variable ‘work experience’, two groups were formed, namely novices (less than three years of work experience) and expert teachers (three or more years of work experience), based on the categorization of Tschannen-Moran and Woolfolk Hoy (2007). Finally, for the fourth hypothesis (H4) the factor gender was investigated in addition to the anchoring effect.

Results

In this research four hypotheses were tested per educational change initiative (differentiation and 21st century skills). In this section descriptive statistics will be provided, followed by the results of the two-way MANOVAs and finally the results of the MANCOVAs.

Descriptives

Regarding the control variable, teachers scored relatively high on the habit of working with differentiation, namely 4.18 (*SD* = 0.62) and moderate to high on the habit of working with 21st century skills, namely 3.85 (*SD* = 0.90). This means that teachers, on average, were relatively familiar with applying the educational changes in practice and considered it to be a habit. When considering the scores on commitment to change, teachers scored high on affective commitment for both educational change topics, namely 4.48 (*SD* = 0.46) on affective commitment for differentiation and 4.20 (*SD* = 0.48) on affective commitment for 21st century skills. This means that, on average, teachers were positive about supporting the changes presented. Scores on normative commitment were less than scores on affective commitment, but still between moderate to high, namely 3.84 (*SD* = 0.72) for differentiation and 3.68 (*SD* = 0.60) for 21st century skills. Teachers thus, on average, felt a moderate to high sense of obligation to support the change. Scores on continuance commitment were below moderate as teachers scored continuance commitment with 2.44 (*SD* = 0.82) for differentiation and with 2.60 (*SD* = 0.73) for 21st century skills. Thus, the average teacher did not feel the need to change in order to prevent failure. When considering the average scores of the different groups (control group, low anchor group and high anchor group), solely small differences were found, as depicted in Table 3.

Table 3

Means and Standard Deviations per Condition group for Job Satisfaction, Work Experience, Gender, and for Scores on Habit (Control Variable) and Commitment to Change (Differentiation and 21st Century skills)

		Condition		
		Control	Low Anchor	High Anchor
Job satisfaction	*M (SD)*	7.86 (0.78)	7.89 (0.65)	7.80 (0.74)
Work experience	*M (SD)*	1.95 (0.22)	1.95 (0.22)	1.92 (0.27)
Gender	*M*	1.96	1.92	1.91
Differentiation				
Habit	*M (SD)*	4.14 (0.51)	4.19 (0.69)	4.19 (0.65)
Affective commitment	*M (SD)*	4.52 (0.44)	4.48 (0.50)	4.46 (0.45)
Normative commitment	*M (SD)*	3.72 (0.72)	3.90 (0.78)	3.86 (0.65)
Continuance commitment	*M (SD)*	2.42 (0.79)	2.57 (0.92)	2.33 (0.73)
21st century learning				
Habit	*M (SD)*	4.07 (0.92)	3.70 (0.88)	3.81 (0.87)
Affective commitment	*M (SD)*	4.25 (0.45)	4.17 (0.52)	4.18 (0.47)
Normative commitment	*M (SD)*	3.73 (0.61)	3.68 (0.60)	3.63 (0.60)
Continuance commitment	*M (SD)*	2.63 (0.71)	2.59 (0.78)	2.58 (0.71)

Table 4 shows Pearson's correlation among commitment to change, habit, gender, work experience and job satisfaction. An effect of $r = .10$ was considered small, an effect of $r = .30$ as medium and an effect of $r = .50$ as large (Field, 2009). Large significant positive correlations were found between the normative commitment towards both educational changes, the affective commitment for both educational changes and the continuance commitment of both educational changes. This means that, on average, teachers being committed to the change differentiation, were accompanied by a similar commitment to the change 21st century skills.

When looking at correlations between habit and commitment to change, small and medium significant positive correlations were found for both educational changes between habit and affective commitment, and habit and normative commitment. Teachers familiar to apply the educational changes were thus, on average, accompanied with a positive attitude on supporting the change and a sense of obligation to commit to the change.

Significant correlations were also found, for both educational changes, between types of commitment. Between normative commitment and continuance commitment, a medium significant positive correlation was found. This means that on average, teachers that felt a sense of obligation to commit to the changes were also likely to feel committed to the changes to prevent failure. A less strong, but significant, positive correlation was found between normative commitment and affective commitment. In other words, on average, teachers that feel a sense of obligation to support the changes, were accompanied by the feeling of wanting to support the change. Finally, a small negative significant correlation was found between affective commitment and continuance commitment. This means that on average, teachers with a positive attitude towards the educational change were also likely to feel accompanied with less feelings of committing to change in order to prevent failure.

A small positive significant correlation was found between gender and normative commitment for 21st century skills, and a small negative significant correlation between gender and job satisfaction. On average, women felt they needed to commit to the 21st century skills change out of obligation, and men were accompanied with lower scores on job satisfaction.

Small negative significant correlations were found between job satisfaction and continuance commitment for both educational changes, and normative commitment for 21st century skills. This means that teachers that are satisfied about their job, on average, score low on the sense of obligation to commit to an educational change due to feelings of fear or obligation. A small positive correlation was found between job satisfaction and affective communication for differentiation. This means that, on average, satisfied teachers also showed high scores on wanting to support the educational change differentiation.

Table 4

Pearson Correlation of variables for Differentiation and 21st Century skills

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Gender											
2. Habit differentiation	.02										
3. Continuance commitment differentiation	.04	-.05									
4. Affective commitment differentiation	.13	**.41***	**-.17***								
5. Normative commitment differentiation	.13	**.19***	**.44***	**.28***							
6. Habit 21st century skills	-.02	**.14***	-.07	**.19***	.03						
7. Continuance commitment 21st century skills	.08	-.05	**.59***	**-.19***	**.35***	-.12					
8. Affective commitment 21st century skills	.06	**.25***	-.12	**.55***	**.19***	**.34***	**-.24***				
9. Normative commitment 21st century skills	**.18***	**.18***	**.26***	**.27***	**.57***	.05	**.39***	**.27***			
10. Work experience	.07	.09	.01	-.07	.05	-.11	**.15***	.00	.14		
11. Job satisfaction	**-14***	.12	**-.19***	**.17***	-.09	.13	**–.18***	.13	**-.15***	–.04	
M	1.93	4.18	2.44	4.48	3.84	3.85	2.60	4.20	3.68	1.94	7.85
SD	—	0.62	0.82	0.46	0.72	0.90	0.73	0.48	0.60	0.24	0.72

Note. $*p < 0.05$.

Finally, a small positive correlation was found between work experience and continuance commitment towards 21st century skills. Thus, for 21st century skills, teachers that had a high level of work experience, on average, also felt they needed to implement 21st century skills to avoid failure.

In addition, one-way ANOVAs were conducted in order to assess if the low anchor (4.9) and high anchor (7.1) had an effect on the scores participants gave to the educational changes on a scale from 0 to 10. No significant differences were found between the three condition groups for differentiation with $F(2, 232) = 1.26$, $p = .285$ nor for 21st century skills, namely $F(2, 212) = 2.10$, $p = .126$. In other words, both anchors (low and high) did not lead to the anchoring effect when ranking the educational change initiatives.

Difference in Commitment to Change between Conditions

In order to determine whether there were differences between the low anchor, high anchor and control condition group on commitment to change (affective, normative and continuance commitment) while controlling for the habit of working with the change (H1), a MANCOVA was conducted for each educational change (differentiation and 21st century skills). Results were non-significant for differentiation, namely $F(6, 416) = 1.45$, $p = .195$ Wilks' $\Lambda = .959$, $\eta_p^2 = .02$ and also for 21st century skills, namely $F(6, 394) = 0.20$, $p = .978$ Wilks' $\Lambda = .994$, $\eta_p^2 = .00$. In other words, for both educational changes the scores on commitment to change (affective, continuance, and normative commitment) did not significantly differ between the low, high and control group, when keeping the habit of using the change initiatives constant.

When zooming in on the values of the dependent variables (affective, continuance, and normative commitment) as depicted in Table 5, the habit of working with the educational change (control variable), had a significant effect on the affective commitment scores of both educational changes, a significant effect on the normative commitment for differentiation and a near significant effect on continuance commitment of 21st century skills. It thus can be stated that the habit of using

the proposed change initiatives is a source of variation that affects commitment to change. In this experiment the habit of using the change initiatives was kept constant.

Table 5

Values of the Individual Predictors (Condition) and Control Variable (Habit) on the Three Types of Commitment to 21st century skills and Differentiation

Independent variable	Dependent variable	*F*	*df*	*p*
21st century skills				
Habit	Affective commitment	24.50	1, 202	< .001
	Normative commitment	0.35	1, 202	.555
	Continuance commitment	3.28	1, 202	.072
Condition	Affective commitment	0.01	2, 202	.981
	Normative commitment	0.31	2, 202	.652
	Continuance commitment	0.31	2, 202	.751
Differentiation				
Habit	Affective commitment	7.44	1,213	< .001
	Normative commitment	4.11	1,213	.004
	Continuance commitment	0.32	1,213	.489
Condition	Affective commitment	0.10	2,213	.768
	Normative commitment	1.48	2,213	.226
	Continuance commitment	2.17	2,213	.201

A Bonferroni post hoc test was conducted to investigate the presence of possible difference on commitment to change (affective, normative and continuance commitment) between the low anchor and control group, the high anchor and the control group and the low anchor and high anchor group, while controlling for the habit of working with the change. This was done for both educational changes (differentiation and 21st century skills). Results were non-significant as portrayed in Table 6. In other words, for both educational changes the scores on commitment to change (affective, continuance, and normative commitment) did not significantly differ between one or more groups (the low, high and control group), when keeping the habit of using the change initiatives constant.

Table 6

Post hoc Bonferroni Comparison for Conditions of Commitment to change for 21st Century Skills and Differentiation

Dependent variable	Comparison conditions	*M* difference	*SE*	*p*	95% CI
21st century skills					
Affective commitment	Low vs. Control	0.00	.08	≈ 1.000	[-0.20, 0.20]
	High vs. Control	-0.01	.08	≈ 1.000	[-0.21, 0.19]
	Low vs. High	0.01	.08	≈ 1.000	[-0.17, 0.20]
Normative commitment	Low vs. Control	-0.04	.11	≈ 1.000	[-0.31, 0.23]
	High vs. Control	-0.10	.11	≈ 1.000	[-0.36, 0.16]
	Low vs. High	0.06	.10	≈ 1.000	[-0.18, 0.30]
Continuance commitment	Low vs. Control	-0.09	.13	≈ 1.000	[-0.41, 0.24]
	High vs. Control	-0.09	.13	≈ 1.000	[-0.41, 0.23]
	Low vs. High	-0.00	.12	≈ 1.000	[-0.29, 0.29]
Differentiation					
Affective commitment	Low vs. Control	-0.03	.07	≈ 1.000	[-0.21, 0.14]
	High vs. Control	-0.05	.07	≈ 1.000	[-0.23, 0.12]
	Low vs. High	0.02	.07	≈ 1.000	[-0.15, 0.18]
Normative commitment	Low vs. Control	0.21	.12	.272	[-0.09, 0.51]
	High vs. Control	0.15	.12	.657	[-0.14, 0.44]
	Low vs. High	0.06	.11	≈ 1.000	[-0.21, 0.34]
Continuance commitment	Low vs. Control	0.15	.14	.918	[-0.20, 0.49]
	High vs. Control	-0.09	.14	≈ 1.000	[-0.43, 0.25]
	Low vs. High	-0.24	.13	.225	[-0.82, 0.55]

Note. CI = confidence interval. *p* is adjusted for multiple comparison Bonferroni.

Difference in Anchored Commitment to Change

To determine whether there were individual differences in the sensitivity of teachers towards anchoring, two-way MANOVAs were conducted for each educational change (differentiation and 21st century skills). For these analyses the habit of using the educational change was not kept constant. The three independent variables considered were job satisfaction, work experience (novice and expert teacher) and gender (male and female). Solely data from the low anchor and high anchor groups were considered in the analyses, as teachers in the condition group were not exposed to an anchor value.

Table 7

Results of the Two-way MANOVAs of Job Satisfaction and Condition (low and high anchor) on the Three Types of Commitment to 21st Century Skills and Differentiation

Independent variables	Dependent variables	F	*df*	*p*
21st century skills				
Job satisfaction	Affective commitment	2.93	5, 147	.015
	Normative commitment	1.91	5, 147	.096
	Continuance commitment	1.08	5, 147	.373
Condition (low – high anchor)	Affective commitment	0.21	1, 147	.651
	Normative commitment	0.26	1, 147	.609
	Continuance commitment	0.91	1, 147	.341
Job satisfaction * Condition	Affective commitment	0.66	4, 147	.621
(low – high anchor)	Normative commitment	0.53	4, 147	.716
	Continuance commitment	1.00	4, 147	.411
Differentiation				
Job satisfaction	Affective commitment	2.05	5, 154	.075
	Normative commitment	1.39	5, 154	.233
	Continuance commitment	1.95	5, 154	.090
Condition (low – high anchor)	Affective commitment	0.02	1, 154	.900
	Normative commitment	3.48	1, 154	.064
	Continuance commitment	7.63	1, 154	.007
Job satisfaction * Condition	Affective commitment	0.34	4, 154	.854
(low – high anchor)	Normative commitment	1.44	4, 154	.223
	Continuance commitment	2.31	4, 154	.061

Job satisfaction. There were no statistically significant interaction effects found between job satisfaction and type of anchoring (low or high anchor) on the combined dependent variables, for both educational changes. Namely $F(12, 357) = 0.76$, $p = .699$ Wilks' $\Lambda = .936$ for 21st century skills. Also no significant interaction effects were found for 21st century skills on the separate dependent variables between job satisfaction and the type of anchoring (low or high anchor), as shown in Table 7. For the educational change differentiation the results were $F(12, 376) = 1.00$, $p = .446$ Wilks' $\Lambda = .920$. As displayed in Table 7, no significant interaction effects were found for differentiation on the separate dependent variables between job satisfaction and type of anchoring. In other words, the relationship between anchoring and commitment towards the educational change initiatives

(differentiation and 21st century skills), did not differ based on the level of job satisfaction of the teachers (H2).

Table 8

Results of the Two-way MANOVAs of Work Experience and Condition (low and high anchor) on the Three Types of Commitment to 21st Century Skills and Differentiation

Independent variables	Dependent variables	F	*df*	*p*
21st century skills				
Work experience	Affective commitment	0.04	1, 147	.844
	Normative commitment	5.54	1, 147	.020
	Continuance commitment	4.43	1, 147	.037
Condition (low – high anchor)	Affective commitment	0.23	1, 147	.879
	Normative commitment	0.42	1, 147	.520
	Continuance commitment	0.00	1, 147	.966
Work experience * Condition	Affective commitment	0.01	1, 147	.922
(low – high anchor)	Normative commitment	0.23	1, 147	.632
	Continuance commitment	0.01	1, 147	.944
Differentiation				
Work experience	Affective commitment	0.49	1, 154	.486
	Normative commitment	0.87	1, 154	.354
	Continuance commitment	0.04	1, 154	.846
Condition (low – high anchor)	Affective commitment	0.00	1, 154	.953
	Normative commitment	1.54	1, 154	.216
	Continuance commitment	0.05	1, 154	.830
Work experience * Condition	Affective commitment	0.00	1, 154	.953
(low – high anchor)	Normative commitment	2.76	1, 154	.099
	Continuance commitment	0.40	1, 154	.530

Work experience. Between the independent variable work experience and the type of anchoring (low or high anchor), there were also no statistically significant interaction effects found on the combined dependent variables, for both educational changes. Namely $F(3, 142) = 0.15$, $p = .933$ Wilks' $\Lambda = .997$ for 21st century skills. Table 8 displays that no significant interaction effects were found for differentiation on the separate dependent variables either (affective, normative and continuance commitment) between work experience and type of anchoring (low or high anchor). The results for differentiation were $F(3, 149) = 1.03$, $p = .381$ Wilks' $\Lambda = .980$. No significant interaction

effects were found for differentiation on the separate dependent variables between work experience and type of anchoring. These results mean that the relationship between anchoring and commitment towards the educational change initiatives (differentiation and 21st century skills), did not differ based on the level of work experience (novice and expert teachers) (H3).

Gender. When looking at the combined dependent variables, there were also no statistically significant interaction effects found between gender and the type of intervention (low or high anchor) for both educational changes. Namely $F(3, 142) = 2.19$, $p = .092$ Wilks' $\Lambda = .956$ for 21st century skills. However, Table 9 displays that when zooming in on the separate dependent variables, one significant interaction effect was found for gender and the condition (low or high anchor) on the normative commitment to 21st century skills. In order to determine what caused this interaction effect, descriptive statistics were investigated, as it was not possible to perform a post hoc test due to the few male teachers in the low ($n = 6$) and high anchor group ($n = 8$). For men, there was a difference of 0.70 in the average scores between the normative commitment in the low and the high anchor condition, namely 2.86 ($SD = 0.41$) for the low anchor and 3.56 ($SD = 0.83$) for the high anchor. For females the average scores on normative commitment differed much less, namely 3.75 ($SD = 0.56$) for the low anchor, and 3.63 ($SD = 0.59$) for the high anchor. In Figure 1, the differences have been visualized. In all, it can be stated that male teachers appeared to be more sensitive to the low anchor on the normative commitment to 21st century skills than female teachers.

For differentiation the results were $F(3, 149) = 0.90$, $p = .444$ Wilks' $\Lambda = .982$. Table 9 displays that no significant interaction effects were found for differentiation on the separate dependent variables (affective, normative and continuance commitment) between gender and type of anchoring (low or high anchor).

In all, the results mean that the relationship between anchoring and commitment towards the educational change initiatives (differentiation and 21st century skills) was not stronger for female

teachers than male teachers as hypothesized (H4). In contrast, the relation between the low anchor and normative commitment to 21st century skills were stronger for male teachers than for female teachers. It must be noted that this difference was not found for the high anchor and normative commitment to 21st century skills, the other types of commitment (affective and continuance commitment) or for the other educational change (differentiation).

Table 9

Results of the Two-way MANOVAs of Gender and Condition (low and high anchor) on the Three Types of Commitment to 21st Century Skills and Differentiation

Independent variables	Dependent variables	F	*df*	*p*
21st century skills				
Gender	Affective commitment	0.77	1, 147	.381
	Normative commitment	7.78	1, 147	.006
	Continuance commitment	1.65	1, 147	.200
Condition (low - high anchor)	Affective commitment	0.09	1, 147	.762
	Normative commitment	2.66	1, 147	.105
	Continuance commitment	1.06	1, 147	.305
Gender * Condition	Affective commitment	0.19	1, 147	.661
(low – high anchor)	Normative commitment	5.52	1, 147	.020
	Continuance commitment	1.75	1, 147	.188
Differentiation				
Gender	Affective commitment	2.50	1, 154	.116
	Normative commitment	3.12	1, 154	.080
	Continuance commitment	0.24	1, 154	.622
Condition (low – high anchor)	Affective commitment	0.65	1, 154	.420
	Normative commitment	0.70	1, 154	.406
	Continuance commitment	0.09	1, 154	.771
Gender * Condition	Affective commitment	1.30	1, 154	.255
(low – high anchor)	Normative commitment	1.85	1, 154	.175
	Continuance commitment	0.67	1, 154	.415

Taken together, the answer to the first hypothesis is that the low and high anchor did not affect primary school teachers' affective, continuance and normative commitment to implement educational change initiatives when controlling for the habit of using these change initiatives. Moreover, the

relationship between anchoring and commitment towards the educational change initiatives (differentiation and 21st century skills) was thus not stronger amongst teachers with a low level of job satisfaction than for teachers that were satisfied about their job (H2), was not less strong amongst teachers that had more work experience than teachers that have little work experience (H3) and was not stronger for female teachers than male teachers (H4). In relation to hypothesis four it must be noted that male teachers showed more sensitivity to the low and high anchor on normative commitment to 21ste century skills than female teachers, this does not lead to the confirmation of the hypotheses of this study (H4). In Table 10 the status of the four hypotheses per educational change are summarized.

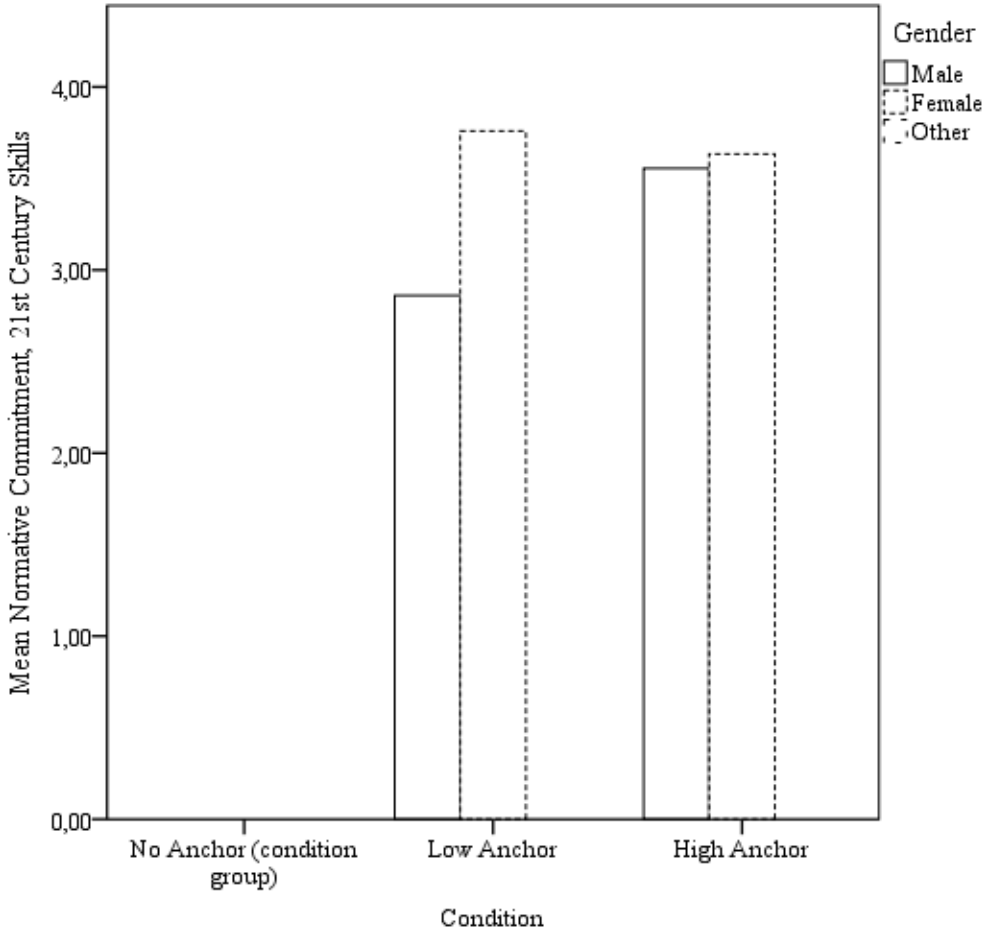

Figure 1. Gender differences between the low and high anchor group on normative commitment to 21st century skills

Table 10

Status of the Four Hypotheses per Educational Change

Hypotheses	**Educational change**	**Groups**	**Status**
Anchoring has an effect on teachers' affective, continuance and normative commitment to implement educational change initiatives when controlling for the habit of using these changes. Moreover, there is a difference in the level of commitment to change when priming the low or the high anchor (H1)	21st century learning	Control vs. low anchor	Rejected
		Control vs. high anchor	Rejected
		Low anchor vs. high anchor	Rejected
	Differentiation	Control vs. low anchor	Rejected
		Control vs. high anchor	Rejected
		Low anchor vs. high anchor	Rejected
For Dutch primary school teachers in the anchoring conditions, the relationship between anchoring and commitment to change is stronger for teachers who are unsatisfied than for teachers who are satisfied about their jobs (H2)	21st century learning	Low anchor vs. high anchor	Rejected
	Differentiation	Low anchor vs. high anchor	Rejected
For Dutch primary school teachers in the anchoring conditions, the relationship between anchoring and commitment to change is less strong amongst teachers that have more work experience than teachers that have little work experience (H3)	21st century learning	Low anchor vs. high anchor	Rejected
	Differentiation	Low anchor vs. high anchor	Rejected
For Dutch primary school teachers in the anchoring conditions, the relationship between anchoring and commitment to change is stronger for female teachers than for male teachers (H4)	21st century learning	Low anchor vs. high anchor	Rejected
	Differentiation	Low anchor vs. high anchor	Rejected

Discussion

The aim of this research was to investigate to what extent primary school teachers' commitment to organizational change can be influenced when they are primed through anchoring, while controlling for the habit of using these changes in practice. Moreover, this study focused on the sensitivity of teachers to the anchoring effect by considering the individual factors job satisfaction, work experience and gender. The conclusions of this study will be explained per hypothesis.

Priming through Anchoring

The anchoring effect on commitment to change (i.e. affective, continuance and normative commitment to change), was expected to be present and differ between the low and high anchor. This was not confirmed, despite keeping the habit of using the proposed changes constant. There are several reasons that may explain why the first hypothesis has to be rejected.

Firstly, the anchoring effect in this experiment might have failed to occur due to the used anchor values. The low anchor (4.9) may possibly have been considered as 'extremely low', as the average scores on commitment given to both educational change initiatives in all groups were quite higher. This is in line with results of Wegener, Petty, Detweiler-Bedell, and Jarvis (2001), that found that moderate anchors generated a larger anchoring effect than extreme anchors. Furnham and Boo (2011), based on their meta-analysis on anchoring studies, also state that when anchors are considered as implausible, or too extreme, the anchoring effect decreases. It is thought that a person that considers an anchor value as too extreme, will adjust the value to what is considered logical, and thus does not use the anchor presented. The high anchor (7.1), chosen to promote teachers to be positive about the educational changes, seems too low also, considering the high average scores on commitment of teachers in all groups on both the differentiation and 21st century skills change. In addition, the anchors not only failed to lead to differences on commitment to change, but also did not lead to differences between conditions on the scores teachers provided on a scale from 0 to 10 to the change initiatives. This is striking, as the anchoring effect has been found to be a robust phenomenon (e.g. Furnham & Boo, 2011; Mussweiler, 2001; Welsh et al., 2014). As the anchoring effect did not occur for both classroom differentiation and 21st century skill education, this suggests that the anchor values chosen in this experiment could have been too extreme. In all, it is likely that both the low and the high anchor values chosen for this experiment have not been sufficient to establish the anchoring effect.

Secondly, the absence of the anchoring effect on commitment to change, might be explained by the change scenarios provided to the teachers before being exposed to the anchor value. The change scenarios were explicitly written to portray high levels of practicality (Doyle & Ponder, 1977), namely (a) with clear and concrete clues for application in class, (b) with a high level of congruence with teachers' vision on themselves and students and (c) by showing that the 'costs' of investment would have a high return. Perhaps the change scenarios were so attractive that it made the teachers consciously decide to commit to the change, prohibiting the anchor value to lead to the anchoring effect. This explanation would be in line with the theory of Doyle and Ponder (1977), namely that teachers consciously and rationally decide whether to commit to educational change based on its practicality (Doyle & Ponder, 1977; Reid, 2014). However, more research is needed in order to determine if the anchoring effect is indeed influenced by the practicality of the change scenarios.

In the third place, the sensitivity of teachers to the anchoring effect might have decreased due to their fairly high educational background. This is in line with the study of Bergman, Ellingsen, Johannesson and Svensson (2010), who found that although the anchoring effect did not disappear amongst people with high levels of cognitive ability, it did decrease in comparison to people with lower levels of cognitive abilities. Welsh et al. (2014), in their anchoring experiment, also discovered that high levels of (meta) cognition and education were a positive predictor of expertise. Experts assessing an anchor in their field of expertise, were less influenced by it (Welsh et al., 2014). Oechssler, Roider and Schmitz (2009) explain these outcomes by stating that highly educated people might recognize the anchoring effect psychology and are therefore not biased by it: they simply ignore the anchor value once they consciously perceive it as an anchor. A study of Furnham et al. (2012), on the other hand, did not obtain any correlations between intelligence and the sensitivity to the anchoring effect.

And finally, an explanation that could clarify the absence of the anchoring effect, however solely on the scoring of the educational changes, can be found in the high familiarity of the teachers with the proposed educational changes. For both educational changes, teachers showed relatively high levels of habit. The habit of using the educational changes was originally measured because of the expected variance it could cause on the dependent variable, commitment to change, hence why it was kept constant. Nonetheless, the high scores on habit in all conditions can now also be seen as an indication that teachers were less affected by the anchoring effect. Several scholars indeed found that experience or knowledge in the anchor domain reduces the anchoring effect (Newell & Shanks, 2014; Smith et al., 2013; Welsh et al., 2014). A possible explanation provided by Smith et al. (2013) is that knowledgeable people have more access to anchor inconsistent information, which mitigates the influence of the anchor. Moreover, when someone is knowledgeable about the anchor domain, the range of plausible answers is narrower than for less knowledgeable people, which diminishes the anchoring effect also (Smith et al., 2013). In other words, a teacher that is using one change initiative on a regular basis is probably able to assess the worth of an educational change well, which in turn reduces the influence of the anchor. However, results have not been conclusive (Furnham & Boo, 2011).

In conclusion, there are arguments that might explain why the anchoring effect did not occur (twice) and no differences in commitment to change were found. It would thus be premature to state that anchoring does not influence commitment to organizational change. Future research is needed to investigate if similar research yields the same results.

Difference in Anchored Commitment to Change

For hypothesis two, three and four, about the sensitivity of teachers towards the anchoring effect on commitment to change based on individual factors, solely the low and high anchor groups were considered as they were primed with an anchor. In contrast with the analyses for hypothesis one,

the habit of using the educational change was not kept constant in the analyses of hypotheses two, three and four. Based on the results, hypotheses two, three and four were all rejected. However, it was found that the normative commitment on 21st century skills of males differed between the low and the high anchor group in comparison with the normative commitment on 21st century skills of females. This will be discussed next, after zooming in on job satisfaction, and work experience.

Job satisfaction. Concerning job satisfaction, it was expected that unsatisfied teachers would be more affected by the anchoring effect than satisfied teachers, mainly due to previous findings on anchoring and having a sad mood (Englich & Soder, 2009). However, no differences were found when considering the commitment to change and the job satisfaction of teachers in the low and high anchor group. Moreover, throughout all conditions teachers showed strikingly high levels of job satisfaction. This is remarkable considering the high work pressure in primary education in the Netherlands (Remie, 2019), but might also confirm that the Selective Accessibility Model, as initially expected, is applicable. In line with this model, being in a happy mood is considered to lead to less careful consideration of anchor information than when being in a sad mood, which in turn leads to less extensive search for anchor consistent knowledge, reducing the anchoring effect (Englich & Soder, 2009; Furnham & Boo, 2011). This might explain why the anchoring effect in this study did not occur amongst the satisfied teachers participating in this experiment. So, a study among a bigger group of primary school teachers, with more unsatisfied teachers, might yield different results than found at present. In all, although the second hypothesis must be rejected, the results offer clues that the individual variable ‘job satisfaction’ may indeed influence the anchoring effect on commitment to change.

Work experience. It was hypothesized that expert teachers would have a better understanding of how educational changes actually translate to day-to-day practice, which in turn would make them less sensitive to the high and low anchor than novice teachers (Smith et al., 2013; Welsh et al., 2014).

However, when comparing the commitment to change from teachers in the low and high anchor group with different levels of work experience (novice teachers vs. expert teachers), no differences were found. This is in line with findings of Northcraft and Neale (1987), who found no difference in anchoring effects between amateurs and experts either, in their study about real estate. An explanation for the lack of difference in sensitivity between novice and expert teachers might link to the nature of the two educational changes employed in this research. As mentioned previously, teachers showed high levels of habit regarding the proposed changes. For differentiation, average scores of novice teachers were 3.96 (*SD* = 0.58) and of career teachers 4.19 (*SD* = 0.62). For 21st century skills, average scores of novice teachers were 4.22 (*SD* = 0.60) and of career teachers 3.82 (*SD* = 0.91). The high levels of habit regarding the proposed changes might have led both novice and career teachers to ignore the anchor values, and thus possibly made them less sensitive to the anchoring effect (Smith et al., 2013).

Gender. For gender, it was expected that the anchoring effect on commitment to change would be higher amongst female teachers than male teachers. This hypothesis is rejected, in contrast with the findings of several anchoring studies (Hügelschäfer & Achtziger, 2013; Kudryavtsev & Cohen, 2011; Welsh et al., 2014) females in this study were not influenced by the anchor values. Surprisingly it was found that males were influenced by the anchor values on the normative commitment to 21st century skills. This effect for males was not found for affective and continuance commitment to 21st century skills or for any type of commitment to the educational change differentiation.

It is remarkable that, although the anchoring effect was absent in this study when performing analyses for the first hypothesis, it did occur when focusing on males on the normative commitment to 21st century skills. This might be a clue that male teachers are influenced more by the low anchor than female teachers. However, this is questionable because (a) the effect might have occurred

because of the low amount of males in both the low anchor group (n = 6) and high anchor group (n = 8), in comparison with the females in the low anchor group (n = 73) and high anchor group (n = 80). Thus, the small number of male teachers might have made the results less reliable (Dooley, 2009). It (b) might also be explained by the difference in the analyses, namely in contrast with hypothesis one the control group was not included in the analyses for hypotheses four and the habit of using the educational change was not kept constant in the analyses for hypotheses four. Moreover, (c) results were only found on normative commitment to 21st century skills, but not on normative commitment to differentiation or the other types of commitment measured in this experiment. Finally (d), to the authors knowledge, it was not found before that males were more sensitive to an anchor value than females (Hügelschäfer & Achtziger, 2013; Kudryavtsev & Cohen, 2011; Welsh et al., 2014).

Besides males appearing to be influenced by the low and high anchor on the normative commitment to 21st century skills, no other gender differences were found. Perhaps gender differences have diminished due to the teachers' professional competences. As previously stated, it was argued by Kudryavtsev and Cohen (2011) that women are influenced by anchor values more because men are considered global thinkers that quicker ignore anchor values than women (who have more focus on details and subtleties). Thinking globally, or *holistic thinking*, is also an important professional competence that both female and male teachers need (Ministerie van Onderwijs, Cultuur en Wetenschap, 2017). Holistic thinking can be defined as providing attention to the entire context as a whole, instead of individual elements (Cheek & Norem, 2017). Primary school teachers in the Netherlands, are expected to be generalists and think holistically, as they are required to educate children on a broad field of subjects (Ministerie van Onderwijs, Cultuur en Wetenschap, 2017). It was found by Cheek and Norem (2017) that people that show a holistic approach in their thinking, are less influenced by the anchoring effect. A possible explanation provided is that this is caused by a less deep analysis of anchor values by holistic thinkers than analytical thinkers, causing them to

take the entire context into consideration, and hereby diminishing the effect of the anchor value on the assessment (Cheek & Norem, 2017). In all, the holistic mindset, which is a key competence to have in order to teach in primary education, might have reduced the sensitivity of teachers towards the anchoring effect, reducing possible gender differences.

To conclude, no individual differences on job satisfaction and work experience were found to the anchored commitment to change. This might have been caused by the teachers' high level of job satisfaction and the high level of acquaintance with the changes. For the individual difference gender, in contrast to what was hypothesized, solely male teachers were influenced by the low and high anchor on normative commitment to 21st century skills. The fact that no other differences were found on gender, might be explained by the holistic approach of teachers assessing the anchor values presented to them.

Theoretical Implications

This study contributes to literature by combining concepts from psychological, educational, and organizational science. Based on the results of this study, it can be stated that there is currently little evidence that supports the conceptual assumption that teachers are influenced to commit to change by the priming effect of anchoring. Teachers might thus indeed appear to commit to educational change in a conscious manner, as suggested by Doyle and Ponder (1977). However, more research is needed to be able to make statements with a higher confidence level. Especially since this study found a clue that male teachers might have been influenced by the low and high anchor group on normative commitment to 21st century skills. The theoretical implication of this study is that scholars in organizational change science, when examining factors that influence the successful implementation of change, should put more emphasis on how employees commit to change. More insight will allow for better change strategies, and better change strategies will increase the likeliness that change is implemented successfully.

In addition to the theoretical implications this study has on organizational change literature, it also contributes to literature on the anchoring heuristic by being the first study to investigate the effect of anchoring on commitment to change. Also the explanations provided for the absence of the, usually strong, anchoring effect (Furnham & Boo, 2011; Mussweiler, 2001; Welsh et al., 2014), adds on previous findings by scholars on anchoring, namely: anchor extremity (Furnham & Boo, 2011), and experience in the anchor domain (Newell & Shanks, 2014; Welsh et al., 2014). Moreover, the current study attempted to provide the often called for (Furnham et al., 2012) clarity about individual differences (job satisfaction, work experience and gender) in relation to the anchoring effect.

Practical Implications

This study has practical implications for school heads but also for Human Resources (HR) professionals, when attempting to implement change in organizations. Since there is currently little evidence that teachers make decisions to commit to change in an unconscious manner, there is no immediate need to account for this in change strategies. Instead, school heads and HR professionals could employ the theory of Doyle and Ponder (1977), and ensure that when communicating about change, the practicality of the change is addressed in detail. As portrayed by Reid (2014), teachers are more likely to accept change with a high level of practicality (i.e. instrumentality, congruence, and costs).

Limitations

Some limitations of this research need to be noted. First of all, due to the usage of two similar educational change scenarios (differentiation and 21st century skills) in all conditions (low anchor, high anchor, no anchor group), it is not possible to determine whether the anchoring effect on commitment to change did not occur due to the high practicality (i.e. instrumentality, congruence, costs) of the two change scenarios (Doyle & Ponder, 1977). Secondly, the years of work experience (novice vs. expert teachers) might have not been an appropriate operationalization for having a better

understanding of educational changes. Welsh et al. (2014), for instance, point out that experience cannot solely be operationalized as years of work experience but is moderated by specific factors such as decision style, educational level and experience on the specific task. Welsh et al. (2014) therefore argue that in order to determine whether someone is an expert, one should look at someone's experience with a specific task, not the years of work experience one has (Welsh et al., 2014). As an illustration, a teacher that just graduated from university might have practiced with applying 21st century skills more than an experienced teacher, due to the new criteria of the university. Thirdly, the schools were selected through non-probability sampling, namely convenience sampling. In other words, the schools were chosen by the researcher and not by having an equal chance of being sampled (Dooley, 2009). This might mean that the participants in this study do not reflect the entire population of Dutch primary school teachers. Finally, it must be noted that the questions concerning the normative commitment of 21st century skills and differentiation, did not load on the factors as originally meant in the questionnaire of the three component model of commitment (Herscovitch & Meyer, 2002). Although the commitment to change questionnaire was validated before, the reliability of the questionnaire may have been influenced by it (Field, 2009).

Suggestions for Future Research

This study, ultimately, was set up to test if teachers could be influenced to commit to change in an unconscious manner. The anchoring effect was chosen as an operationalization of unconscious decision making, as anchoring is generally considered as a priming effect that takes place automatic and unconsciously (Newell & Shanks, 2014; Strack & Mussweiler, 1997; Tversky & Kahneman, 1974; Wegener, Petty, Blankenship & Detweiler-Bedell, 2010). However, some findings of this research indicate that teachers might have recognized the anchor value, which may have led to a conscious choice to ignore the anchor value. Newell and Shanks (2014) also indicate, based on their literature review, that the anchor value in fact might be considered in a conscious, effortful way.

However, when a person is not sure about the posed question, the anchor value might still be consciously used to differentiate from, allowing the anchoring effect to occur (Newell & Shanks, 2014). Future research could thus test whether choosing the anchoring effect as an operationalization of unconscious decision making, as done in this research, is the right approach. This could be done by investigating whether a person is unaware of the anchor value by promoting deliberative thinking (e.g. by informing a person about the possible influence of the anchor upfront or in retrospect) or by using (financial) rewards to be accurate during experiments (Newell & Shanks, 2014). In the case the anchoring effect appears to take place through deliberative thinking, scholars could consider employing other priming effects to investigate if commitment to change can be influenced in an unconscious manner. An example is *repetition priming* (Newell & Shanks, 2014), that occurs when a person shows an improvement in behavior when being primed with a stimulus repeatedly.

Since this experiment was the first attempt to investigate the effect of anchoring on commitment to change, it is also suggested that it is replicated in order to assure that results are valid and reliable. For future research the subsequently mentioned adjustments can be considered. First, the study could be executed by using different anchor values in order to control for anchor extremity (Furnham & Boo, 2011). Second, it is suggested that future research, includes newer educational changes than employed in the current study to ensure that teachers consider the change as change. Moreover, it is suggested to add one or two experimental groups that are exposed to educational change scenarios that do not meet the requirement of practicality (Doyle & Ponder, 1977). Lastly, the experiment could be complemented by qualitative research to measure whether the self-reported commitment to change also leads to behavior that supports the change.

From an HR and organizational change perspective, it is also interesting to repeat this research outside the field of education. More insight is clearly needed in the effect of educational background on anchoring (Oechssler et al., 2009; Welsh et al., 2014) and commitment to change. Since Dutch

primary- but also secondary teachers need a bachelor level at minimum, the target group is quite homogenous in their educational background. It is thus suggested to repeat this study outside the educational field also, for instance in the fast-changing technology sector where employees with different educational backgrounds are involved in the design and production of products and services.

Finally, as stated by Furnham et al. (2012), the findings about the influence of individual factors on the sensitivity to anchoring are ambiguous. Since this study found a clue that male teachers might have been influenced more by the low and high anchor than females, it is advised to focus on gender differences in future research on anchoring specifically in order to increase our understanding on this topic.

Conclusion

In the ever-changing world of education, it is key to know how teachers commit to change in order to ensure its successful implementation and make education future proof. This research took on a skeptical mindset towards the long-held vision that teachers commit to change in a conscious manner. Although results did not confirm that commitment to change can be elicited in an unconscious manner through anchoring, while controlling for the habit of using the educational change, it is advocated that more research is done in the future. In all, the main purpose of organizational change research is to safeguard the successful implementation of the fast amount of (costly) change initiatives the future has in store for us.

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