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Audrey R. Hagopian

Self-determination in the kindergarten classroom: Understanding the role of the teacher's utilization of 'precise praise'

A dissertation submitted in partial completion of the MSc Education Degree

(Child Development & Education)

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Abstract

The ways in which teachers use language to interact with their students can have significant implications for children’s academic and behavioral outcomes. It has long been suggested that praise is an important teaching strategy, especially in early education classrooms. However, not all types of praise may result in the desired classroom outcomes. Using a newly operationalized term for praise that conveys pedagogically relevant information, i.e., ‘precise praise,’ we developed and delivered a professional development (PD) program for kindergarten teachers and explored relationships between teachers’ precise praise usage and their students’ psychological need satisfaction of competence, autonomy, and relatedness. Teacher participants were 13 general education kindergarten teachers from a public-charter school system that operates across the southern and southwestern United States. All teachers had high confidence with the language/literacy curriculum (M=8.62, SD=0.65), which was the target subject of the PD intervention. Exploratory in nature, a within-subjects design was adopted to address three main research questions: (1) Is there a change in kindergarten teachers’ utilization of precise praise following their participation in a fully remote, three-session PD coaching program? (2) Does teachers’ change in practice (i.e., increased precise praise usage) predict students’ psychological needs satisfaction of competence, autonomy, and relatedness, as outlined by self-determination theory, measured at a one-week follow-up? (3) Do teacher participants report experiencing their own needs of competence, autonomy, and relatedness as met during the PD program? A repeated-measures ANCOVA model revealed that the PD program was successful at increasing teachers’ precise praise usage over the 5–6-week intervention period, after controlling for teachers’ own expectations for change ($p < .001$). There were positive correlations between teachers’ precise praise usage and student autonomy and relatedness that were approaching significance, however linear regressions to test whether increased precise praise usage predicted students’ psychological needs satisfaction at follow-up did not yield significant results. Responses on a theoretically-based questionnaire confirmed that teacher participants experienced their own psychological need satisfaction met

throughout the PD program. Future research is needed to establish a linkage between teachers’ precise praise usage and students’ psychological need satisfaction, but the study presents interesting new evidence for effective ways that PD can be delivered to teachers, such as fully remote PD designs that are responsive to the psychological needs of a heterogenous teacher workforce. Implications and futures directions for research on praise, teacher professional growth, and psychological need satisfaction are discussed.

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Chapter 1: Introduction

1.1 Self-Determination Theory in the Classroom

According to self-determination theory (SDT), all humans have three basic psychological needs: (1) *competence*, the need to feel skilled or accomplished; (2) *autonomy*, the need for volition; and (3) *relatedness*, the need for human connections (Ryan & Deci, 2000). In a classroom setting, teachers are tasked with the challenging position of meeting their students’ psychological needs, while simultaneously maintaining rigorous learning environments to meet academic benchmarks. Research over the years has attempted to determine teacher actions that are ‘need supportive’ versus ‘need thwarting.’ One of the simplest need supportive teaching techniques to emerge from research is *praise*, though not all praise is considered equal. When praise lacks information or is used in a manipulative or controlling manner, it is likely to be need thwarting; however, praise that conveys information about the praised behavior is likely to support students’ psychological needs (Reeve & Jang, 2006; Soenens & Vansteenkiste, 2020). Currently, the literature distinguishes between praise that communicates information and praise that does not communicate information as behavior-specific praise and general praise, respectively. The findings on teachers’ natural rates of general praise are mixed, though there is a growing consensus that teachers seldom use specific praise forms in the absence of direct training (Zoder-Martell, 2019). Following previous research on teacher praise, and situated within the framework of SDT, we advance a new definition for teacher praise that is need supportive, which we have termed ‘precise praise.’ We hypothesize that when teachers are trained to incorporate precise praise into their instructional practice, their students’ psychological needs of competence, autonomy, and relatedness will be satisfied.

1.2 Study Rationale

Following a movement for more positive behavior management systems in schools (Belgium: Deltour et al., 2022; Greece: Goutas et al., 2021; Norway: Sørlie &

Ogden; 2015; USA: Bradshaw et al., 2008), there have been calls for studies that provide opportunities for teacher learning related to positive instructional strategies, such as effective praise usage (Drake & Nelson, 2021; Jenkins et al., 2015). However, teachers often have little spare time and experience other stressors that prevent their participation in professional learning opportunities. Additionally, in the wake of the COVID-19 pandemic, which placed unprecedented demands on educators on top of existing pressures, there is a heightened need for learning opportunities that are sensitive to the stressors that teachers are currently facing.

1.3 Research Aims

Positioning ourselves as pragmatic researchers, the present study sought to design and test the effectiveness of a short professional development (PD) program, aimed at increasing kindergarten teachers’ awareness and usage of ‘precise praise’ in the U.S. Beyond recommended ethical considerations for educational research, great care was taken to design a program that could practically fit within the demands of a teaching schedule. Utilizing a fully remote modality for the PD program, teachers’ own psychological needs of competence, autonomy, and relatedness were considered in all components of the research design. Teachers’ usage of precise praise, positive feedback, and negative feedback (i.e., ‘feedback statements’) were captured at baseline, and their change in practice was measured throughout and after the PD. Linkages between a teachers’ precise praise usage and their students’ psychological needs satisfaction of competence, autonomy, and relatedness were explored, and teachers’ own psychological need satisfaction throughout the program was measured.

1.4 Dissertation Structure

In the second chapter, we outline the theoretical framework for this study. We will provide an overview of the different ways that teacher praise is operationalized in the literature, critically evaluate prominent psychological theories of learning and behavior, and summarize empirical evidence supporting the use of praise in the classroom,

especially in the early years. We will also discuss the literature on teacher professional growth and evaluate the different tools that are used to facilitate professional learning. The third chapter describes the methods used for this study, including descriptions of the participants, measures, and materials, and the procedure used for delivering the PD program. In the fourth chapter, we present descriptive statistics of teacher feedback statements, followed by the results of each research question. Lastly, chapter five summarizes the findings and limitations of the present study and offers interpretations, implications (both theoretical and applied), and directions for future research.

Chapter 2: Literature Review

2.1 Definitions of Praise

Praise has been the subject of educational research for nearly 60 years and remains a topic of interest because of its feasibility as a 'nonintrusive' classroom strategy. Additionally, in recent years there have been calls for more positive behavior management systems in schools (Jenkins et al., 2015), like the Positive Behavioral Interventions and Supports (PBIS) framework, which aims to create positive learning environments that support children's behavioral, academic, and social-emotional needs (Center on PBIS, 2022). The Cambridge dictionary defines praise as 'admiration or approval' for either achievements or characteristics (Cambridge Dictionary, n.d.). Brophy (1981) was one of the early psychologists to define praise within the context of classroom-process data. Utilizing evidence from experimental and observational studies, Brophy argued that effective teacher praise goes beyond simple approval of an appropriate behavior or acknowledgement of a correct response; when teachers praise students, they express 'positive teacher affect' and communicate information about the value of the praised behavior (Brophy, 1981). Empirical studies that have followed typically operationalize praise in a way similar to Brophy's definition, drawing a distinction between what is usually referred to as 'general' praise and 'behavior-specific' praise (Allday et al., 2012; Drake & Nelson, 2021; Floress et al., 2017a; Fullerton et al., 2009; Ingemarson et al., 2020; Jenkins et al., 2015; Royer et al., 2019). General praise is any positive feedback statement or statement of approval, also referred to as non-specific or generic praise (e.g., "Good job!"). Behavior-specific praise involves adding a description or specifically identifying the praised behavior (e.g., "Good job raising your hand!"). General praise and behavior-specific praise, as well as their opposites (i.e., negative feedback, such as criticisms and reprimands), can collectively be referred to as 'feedback statements.'

2.1.1 Criticisms of Praise

Despite a growing push for the regular practice of praise in schools, some do oppose the usage of praise with children. For example, Kohn (1993) views praise as an extrinsic, controlling motivator, and according to the Montessori method, praise is simply a ‘verbal reward,’ considered just as harmful as tangible rewards. The Montessori method encourages the use of ‘informational encouragement’ over praise (Davis, 2022), though we argue that the distinction the Montessori method draws between encouragement and praise is very similar to how the current literature distinguishes behavior-specific praise from general praise. Additionally, informational encouragement aligns with how we have chosen to operationalize our definition of praise in this study.

2.1.2 Operationalized Definition

Research suggests that behavior-specific praise is more impactful at improving student outcomes than general praise (Chalk & Bizo, 2004; Floress et al., 2017a; Jenkins et al., 2015), a point that will be discussed in greater detail later (see Section 2.3). While the evidence is promising, we argue that the current definitions of behavior-specific praise lack a necessary level of detail to capitalize on what makes specific praise successful. For example, Jenkins et al. (2015) postulated that there is a positive relationship between behavior-specific praise and student outcomes because behavior-specific praise provides children with ‘discriminable conditions,’ i.e., children can replicate desired behaviors in the future because the “specificity of the praise made it easy for the child to discriminate between behaviors” (p. 473). While most definitions of behavior-specific praise include stating *what* is being praised (e.g., “You are being so respectful, great job!” instead of simply, “Great job!”), they do not include stating *how* the child accomplished the behavior or *why* the behavior is valued. We argue that this level of precision helps children recognize the value of the praised behavior and is necessary for facilitating the internalization of an extrinsic motive, which moves the praise beyond classification as a ‘verbal reward.’ For these reasons, we have chosen to operationalize a revised definition of behavior-specific praise, which we have termed ‘precise praise.’

Precise praise is a specific, verbal praise statement that communicates information by clearly stating how and/or why the praised behavior is valued. For example, “Max is being a respectful student by listening to his peers and waiting for his turn to speak. Great job, Max!” This level of specificity not only communicates what is being praised (respectfulness), but how the child showed respect (listening and waiting). We have established four components of precise praise (see Figure 1 and below).

Individualized. Directed toward an individual child or a specific group of children, addressed by name or group.

Specific. Goes beyond simple acknowledgement by providing information about what the child did and offers evidence or specific examples of how and/or why that matters. Precise praise highlights behaviors, not traits, as behaviors are things that children can choose to do.

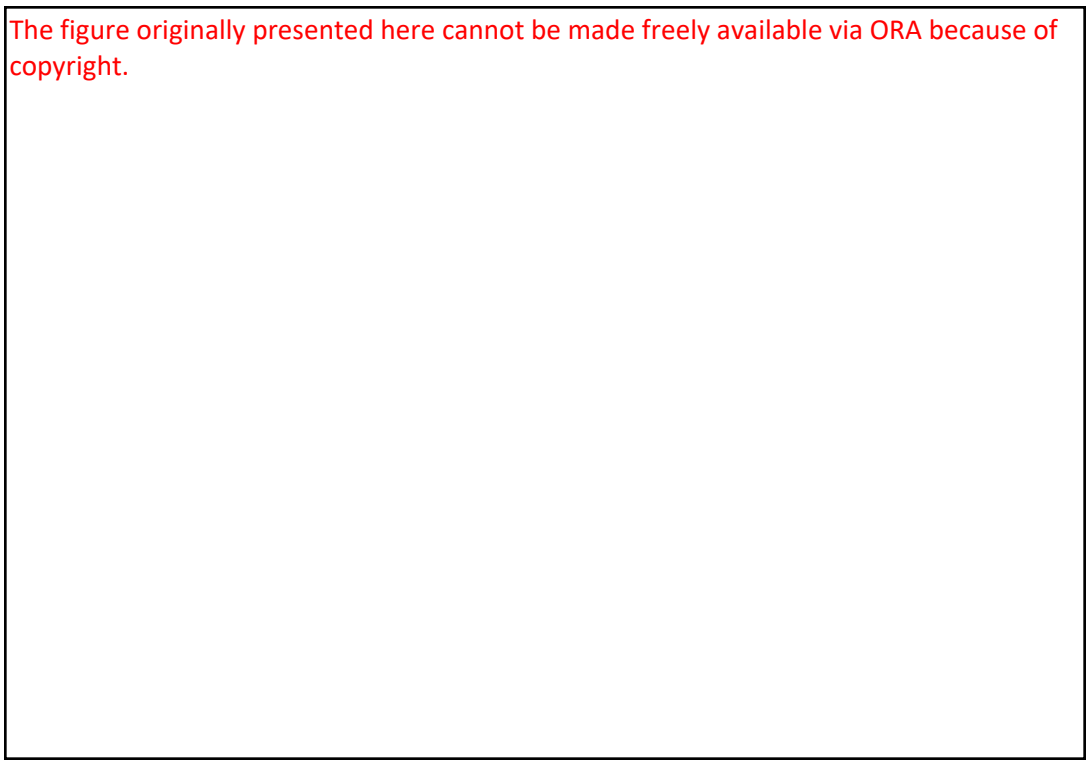
Strategic. Can be used to highlight and re-enforce desired academic and/or social-emotional behaviors and provides an opportunity for other children to benefit from the feedback. When children in the classroom hear precise praise, they are alerted to what behaviors are valued, why they are valued, and how to replicate the desired behaviors in the future.

Encouraging. Precise praise is delivered in a genuine tone. It encourages and motivates the child, and others in the room.

We believe that our definition of precise praise more closely captures the components of effective praise that Brophy outlined. Brophy (1981) argued that effective praise is contingent, specifies the ‘particulars of the accomplishment,’ provides information about the value of the accomplishments, attributes success to effort, and shows appreciation for the praised behavior.

Figure 1

Components of Precise Praise



2.2 Psychological Perspectives of Praise and Learning

Below we have summarized different perspectives of learning, behavior, and motivation. These theories provide frameworks for understanding how a teacher's praise may impact a child's behavior and development. Additionally, we touch upon the strengths and limitations of these theories, particularly within the context of the present study (i.e., U.S. early-education classrooms).

2.2.1 Attribution Theory

Heider (1958) was one of the first psychologists to conceptualize an 'attribution theory' as a way of describing *why* particular outcomes occur. For example, the question of 'why did I get a bad grade?' could be attributed to effort, ability, mood/condition, task

difficulty, amount of help/support, or luck (Weiner, 1979). In a Western context, ability and effort are the most commonly perceived explanations for an outcome (Graham & Chen, 2021), i.e., “I did well because I am smart” (ability), or “He didn’t do well because he is lazy” (effort). Teachers (knowingly or unknowingly) communicate attributional information when they praise their students. For instance, if two students have the same outcome on a test and one is praised while the other is given neutral feedback, the student who is praised is often considered to be of lower ability than the student who is offered neutral feedback (see Meyer et al., 1979, 1986, 2004). This conveys that the praised student had lower ability and thus needed to apply more effort, while alluding to the higher natural ability of the unpraised student. Young children under the age of ten, however, are often unable to ascertain attribution-related information when conveyed in this way (Barker & Graham, 1987; Kun, 1977; Nicholls, 1978), even though they can understand a distinction between effort and ability (Gipps & Tunstall, 1998). For example, if a young child was given neutral feedback while a similarly performing classmate was told “good job!”, the child given neutral feedback would not process that as an acknowledgement of their higher ability compared to their classmate. For this reason, theories of learning must consider how developmental trends impact how children process and interpret praise.

2.2.2 Behaviorism

Behaviorism is a theory of learning that views all behaviors as learned directly from interactions with the environment (Watson & Kimble, 1998). Simply put, behaviors are merely responses to environmental stimuli, and given a stimulus, a response could be predicted, or vice versa. From a behaviorist perspective, a teacher’s response to a child’s behavior impacts the child’s behavior development. For example, a child would learn that praised behaviors are ‘good’ behaviors and would be more likely to increase those behaviors (i.e., positive reinforcement). According to behaviorism, the reverse would also be true; scolded behaviors or punishment would decrease undesired behaviors (i.e., negative reinforcement). Research has shown, however, that controls, such as prizes,

punishments, and threats, while perhaps effective in the short term, are harmful to children’s motivation in the long term (Deci & Ryan, 2008; Patall et al., 2018; Reeve et al., 2004; Reeve & Jang, 2006; Skinner & Belmont, 1993). Additionally, critics of behaviorism argue that the theory can be quite reductionist in nature, and that it attempts to explain behavior without regard to children’s mental or cognitive processes (Moore, 2013). This may be especially true when understanding the impact of specific praise forms that communicate information and are unique to the situation in which the behavior occurred.

2.2.3 Social-constructivist Theory

In contrast to individualistic approaches to learning, like behaviorism, social-constructivist theory (Vygotsky, 1978) is a collectivist approach to learning, where the classroom, as a group of children, takes priority over the individual child. Social-constructivist theory suggests that learning occurs primarily in social and group settings through discourse and discussion. The social constructivist would argue that children learn best when a teacher honors their contributions to the classroom discourse, rather than when they are provided with direct praise (Morrone et al., 2004). There are some debates, however, of whether social-constructivist theory is dependent upon the cultural context. For example, Hong et al. (2001) concluded that Chinese people were more likely to focus on collective duties as part of their cultural identity, whereas Americans were more likely to focus on individual rights. Despite collectivist cultures existing within the U.S., such as those seen in Native American and many immigrant communities, individualistic styles of teaching are predominant in most U.S. classrooms (Faitar, 2006).

2.2.4 Self-determination Theory

Self-determination theory (SDT) is a theory of motivation and personality that posits that when three basic psychological needs (competence, autonomy, and relatedness) are satisfied, self-motivation for learning and overall well-being are yielded (Deci & Ryan, 195; Ryan & Deci, 2000). *Competence* is the need to feel skilled or

accomplished; *autonomy* is the need to feel in control of one’s behaviors; and *relatedness* is the need to feel connected to others (Ryan & Deci, 2000; Ryan & Powelson, 1991; Skinner & Belmont, 1993). According to SDT, a teacher’s actions and feedback statements may support, or thwart, students’ need satisfaction, and as Soenens & Vansteenkiste (2020) describe, the effectiveness of any motivating strategy, such as praise, must be considered within the framework of competence, autonomy, and relatedness need satisfaction. For example, when a teacher’s praise conveys ‘relevant and positive’ information, children are likely to feel more confident about their competencies and know how to approach tasks in the future, making the praise need supportive; however, when praise lacks information or is evaluative, it may be perceived as controlling and thus thwart need satisfaction (Soenens & Vansteenkiste; 2020). An experimental study of 72 teacher-student pairs confirmed the contextual nature of praise; when praise was delivered as informative feedback or as encouragement, it was positively correlated with students’ psychological need satisfaction (r = .38 & .42, respectively, $p < .01$), and though not statistically significant, praise delivered as a ‘contingent reward’ was negatively correlated with need satisfaction (r = -.11) (Reeve & Jang, 2006). Students are likely to have different intrinsic motivations, and so praise may need to be adapted not just to the context in which it is given, but also to the individual child it is given to, to support the internalization of extrinsic motives (Deci & Ryan, 2008). Precise praise can be adapted to support the motivation of varying students, so we argue that SDT is the best framework for conceptualizing the impact of teacher praise in the present study. Further, because psychological needs are considered global to all humans, regardless of age (Ryan & Deci, 2000), and given SDT’s emphasis on the individualized nature of self-motivation, this theory fits best within our setting of early education classrooms in the U.S. The hypothesized relationships between precise praise and SDT will be discussed in greater detail later in this chapter.

2.3 Associations Between Praise and Student Outcomes

As mentioned previously, many educators and researchers cite praise as a useful classroom strategy because it is feasible and nonintrusive; additionally, others note that praise is cost-effective and does not have the disadvantages associated with tangible reinforcers (Brophy, 1981; Zoder-Martell et al., 2019). Despite its practicality, praise should only be advanced as an effective teaching strategy if it is positively linked to student outcomes and there is evidence to support that teachers can be successfully trained to implement praise into their instructional practice. The evidence for associations between praise, student behavior, and academic performance are discussed below.

2.3.1 Student Behavior

Studies have shown there is a positive relationship between teachers’ praise usage and students’ on-task behavior (e.g., Caldarella et al., 2020). In a systematic review of literature on classroom management practices, Simonsen et al. (2008) identified twenty evidence-based teaching practices. The researchers stated that while praise was likely the simplest strategy that was reviewed, it had the largest evidence base, and that teacher praise supported increased on-task behavior, attention, compliance, positive self-talk, and cooperative play (Simonsen et al., 2008). The researchers also argued that the effects of praise are strengthened when the praise is specific and names the desired behavior. Indeed, studies have shown that when teachers are trained to incorporate behavior-specific praise into their teaching practice, students display higher levels of on-task behavior in both general and special education settings (Allday et al., 2012; Chalk & Bizo, 2004; Fullerton et al., 2009; Sutherland et al., 2000; Weeden et al., 2016). Additionally, a meta-analysis of behavior-specific praise training studies (N=28) found that trainings are generally successful at increasing teachers’ usage of behavior-specific praise and produce strong effect sizes (Tau-U = 0.85; 95% C.I. [0.79, 0.90]) (Zoder-Martell, 2019).

2.3.2 Academic Performance

Classroom management strategies aim to improve student behavior, or intervene to prevent undesired behaviors from occurring, so the majority of teacher praise research is concerned with measuring student behavior as the outcome. However, given the positive correlation between behavior and academic achievement (Moffett & Morrison, 2020), it seems probable that teacher praise may also have a positive relationship with academic performance, but the research in this area is limited. The systematic review of evidence-based teaching practices referenced above (Simonsen et al., 2008) also claimed that delivering praise increased students' correct responses, work productivity, and language and math performance, but the evidence in this area was based on only five studies. There is preliminary evidence from intervention studies to suggest that when teachers are trained to increase their praise usage, there are positive associations with their students' rates of correct responses and academic self-concept (see Chalk & Bizo, 2004; Sutherland & Wehby, 2001). However, a systematic review of teacher praise training studies (*N*=29) concluded that more research is needed to better understand how teacher praise is related to academic and instructional outcomes (Floress et al., 2017a). The present study adds to the literature by measuring student literacy performance as an outcome, in addition to other student outcomes.

2.4 Praise in Specific Contexts

2.4.1 The Importance of the Early Years

Evidence from the National Survey of Children's Health revealed that among U.S. children aged 3-17 years, 7.4% had a current behavioral/conduct problem (Ghandour et al., 2019), and longitudinal evidence has shown that early behavior problems are associated with behavior problems in later childhood and beyond (Bornstein et al., 2010). Additionally, children with behavior problems in early elementary are more vulnerable to other negative outcomes, such as poor academic performance and school dropout (Breslau et al., 2009; Darney et al., 2013). Despite the already high rate of behavior challenges that teachers must address, behavior problems are likely to have been exacerbated by school closures during the COVID-19 pandemic; a study of U.S. parents

(*N*=645) with young children found an increasing frequency of child behavior problems following pandemic-related restrictions (Gassman-Pines et al., 2020). Previously, we outlined the positive relationship between teachers’ praise usage and students’ behavioral outcomes, and praise may be particularly impactful for children in the early years as an intervention for behavior challenges and a prevention against later adverse outcomes.

2.4.2 Early Language and Literacy Instruction

Learning to read is possibly one of the most complex cognitive skills that children must master during their school careers (Rayner et al., 2011). Reading is the means by which children access learning across subjects, so kindergarten teachers play a critical role in establishing strong habits and positive attitudes toward reading, as formal reading education in the U.S. begins in kindergarten. Many children struggle with confidence when learning to read (e.g., Boyes et al., 2018), so specific praise forms, such as precise praise, that alert students to successful reading *strategies*, rather than highlighting reading *abilities* (or lack thereof), may be especially impactful during the early stages of language/literacy instruction. Accordingly, we have chosen to situate the present study specifically within the context of language/literacy instruction in the kindergarten classroom.

2.5 Natural Rates of Teacher Praise

Despite research supporting praise as an effective, practical, and easy-to-use teaching strategy, observational studies suggest that teachers’ natural praise rates are not always optimal. The results from two systematic reviews of observational studies of teacher praise are summarized in Table 1. The evidence on natural rates of general praise is mixed, likely due to the varying ways in which praise was operationalized in the studies, but what is evident is that teachers’ natural rates of behavior-specific praise are much lower than their natural rates of general praise. The literature base of natural praise rates is limited, however, and there have been calls for further research in this area, particularly for studies in early years classrooms (Floress & Jenkins, 2015). Further,

Zoder-Martell et al. (2019) argued that teachers 'seldom use' behavior-specific praise in the absence of direct training, so there is also a call for studies that provide professional learning opportunities for teachers, aimed at enhancing their understanding of classroom management practices and increasing their usage of effective praise (Drake & Nelson, 2021; Jenkins et al., 2015).

Table 1

Summary of Natural Teacher Praise Rates Found in Seven Studies of General Education Teachers

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Note. Table is adapted from tables in Jenkins et al. (2015), p. 467 and Drake & Nelson (2021), p. 2413. The adaptation presented in Table 1 includes only those studies that were conducted within general-education classrooms. Praise was operationalized in the same way in both original papers (general praise: any verbal or nonverbal acknowledgement of the student's actions; behavior-specific praise: praise that specifically identifies the desired student behavior).

[a]Indicates an average across grade levels. Praise rates ranged from 43.7 in early elementary to 8.4 in high school.

[b]Author reports on six studies, and praise rate is an average of reported rates.

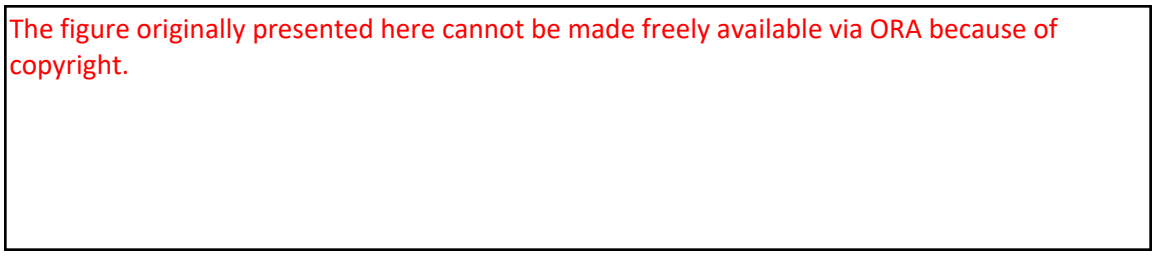
2.6 Change Models of Teacher Growth

We highlighted the call for more studies that provide professional learning opportunities to teachers related to classroom management practices and effective praise techniques. We have also summarized the evidence supporting relatively low natural rates of behavior-specific praise, yet the promising evidence that teachers can be trained to successfully increase their usage of behavior-specific praise. In this section, we will provide an overview of the literature on teacher professional growth, learning, training, and development, in general.

Professional growth signifies the process of expected and continual learning that teachers engage in throughout their careers (Clarke & Hollingsworth, 2002). As the body of research on evidence-based teaching practices continues to evolve, teachers require sufficient training to learn about and implement new evidence-based strategies, and a PD program is the vessel by which training is facilitated (Didion et al., 2020). Clarke & Hollingsworth (2002) argue that for PD to be successful, it must be sensitive to the ways in which teachers grow and change, and researchers over the last forty years have attempted to visualize the process of teacher growth with various ‘change models.’ A common visualization of teacher growth, which we will term the ‘implicit model,’ contends that the goal of PD should be to change a teacher’s attitudes or beliefs about their practice, which in turn will cause the teacher to change their practice, resulting in improved student learning. Various iterations of the implicit model have been created over the years, a version of which is drawn in Figure 2. More recently, Desimone (2009) expanded upon the implicit model by adding a set of five core features of teacher PD programs (content focus, active learning, coherence, duration, and collective participation), which she argued research and education policy at the time had reached a consensus on. The addition of a common conceptual framework for vital features of PD may help to move the field forward, but critics of the implicit model argue that it approaches teacher growth from a deficit perspective, i.e., the teacher has an incorrect belief or view that must be changed.

Figure 2

An Implicit Model of Teacher Professional Growth



Note. Figure was redrawn with modifications to the language in the boxes. Figure adapted from "Improving impact studies of teachers' professional development: Toward better conceptualizations and measures," by L. M. Desimone, 2009, *Educational Researcher, 38*(3), p. 185.

In a departure from the implicit model, Guskey (1986) claimed that teachers' beliefs and attitudes would only change once they saw the tangible benefits from a change in practice. Guskey proposed that PD should aim to change a teacher's practice, which would result in a change in student learning outcomes, which in turn would cause a change in the teacher's beliefs and attitudes. Arguing that Guskey's chain reaction model would benefit from a cyclical representation, showing that teacher growth is not strictly linear, Clarke & Hollingsworth (2002) proposed the 'interconnected model' (see Figure 3). The interconnected model posits that teacher growth occurs from exchanges between four domains (external, practice, consequence, and personal), mediated by enactment and reflection, and situated within the 'change environment.' The cyclical nature of the interconnected model, with multiple entry and exit pathways, acknowledges that teacher growth is individual, varied, and personal, and Clarke & Hollingsworth (2002) cite several studies that provide empirical evidence for the model. Another strength of the interconnected model is that it considers the change environment, which recognizes that a teacher's growth may be facilitated (or hindered) by the school's values, administration, peer support, access to resources, etc. However, the interconnected model is limited in that the supporting evidence was only provided from samples of Australian teachers. It is

possible that there are cultural contexts of change that are not captured by the current interconnected model.

Figure 3

An Interconnected Model of Teacher Professional Growth

Note. Figure was redrawn with simplifications to the language under each domain of practice; single two-way arrows were used in place of double one-way arrows to indicate bidirectional exchanges between domains. Figure adapted from “Elaborating a model of teacher professional growth,” by D. Clarke & H. Hollingsworth, 2002, *Teaching and Teacher Education, 18*(8), p. 951.

As part of a systematic review of early childhood teacher coaching programs and their effects (*N*=33), Yang et al. (2022) proposed what they termed the ‘sophisticated model of change’ (see Figure 4). While the various domains of the sophisticated model are less specific than those of the interconnected model, that is perhaps an advantage of the sophisticated model. For example, Yang et al. (2022) suggest that ‘teacher outcomes’

could capture changes in self-efficacy, knowledge, beliefs, competencies, and/or practice. This potentially allows for the model to sit within various cultural and situational contexts. The sophisticated model also draws a distinction between classroom and child outcomes (i.e., changes in classroom outcomes would foster individual child outcomes). While we argue that our current study sits best within the sophisticated model, the model would benefit from a consideration of critical features of PD, as proposed by Desimone (2009), as well as an acknowledgement of the change environment, as proposed by Clarke & Hollingsworth (2002). Taken together, it is worth addressing that the sheer nature of a model is prescriptive, which poses challenges for conceptualizing the individualized process of teacher growth and change.

Figure 4

A Sophisticated Model of Teacher Professional Growth

Note. Figure was redrawn with adjustments to the layout. Figure adapted from "Coaching early childhood teachers: A systematic review of its effects on teacher instruction and child development," by W. Yang, R. Huang, Y. Su, J. Zhu, W. Hsieh, & H. Li, 2022, *Review of Education*, *10*(1), p. 5.

2.7 Coaching as a Strategy for Professional Development

Above we stated that PD is the vessel by which training is facilitated to teachers. Because the knowledge base of effective teaching practices is constantly evolving, as well as shifting needs of children and young people, PD is necessary not just for new teachers entering the field, but also for veteran teachers (Didion et al., 2020). PD can take on a wide variety of formats, such as workshops, lectures, professional learning communities, coaching, online programs, self-guided resources, etc., and some suggest that combining multiple PD formats is the best way to achieve improved outcomes (Carlisle et al., 2011). The different types of PD can generally be organized into passive formats (e.g., lectures) and active formats (e.g., coaching). Recently, there has been a shift away from passive formats of PD in favor of more active PD formats (DeLuca et al., 2012), and research has suggested that coaching is more effective at evoking change in practice than other PD strategies (Kraft & Blazar, 2018; Yang et al., 2022). Coaching involves the teacher(s) working with an ‘instructional expert/coach’ (such as a master teacher or researcher), and generally includes four components: observation, consultation/feedback, goal setting, and reflection/practice (Downer et al., 2011; Elek & Page, 2019; Yang et al., 2022). As the ultimate goal of PD is to improve student learning (Kennedy, 2016), it is paramount that the impact of coaching is linked to improved student outcomes as well. Evidence from intervention studies, reviews of the literature, and meta-analyses confirm that quality coaching can result in both positive teacher outcomes (e.g., knowledge gains, instruction, teacher-child interactions, classroom environment) and student outcomes (e.g., academic performance, content knowledge, behavior) (Elek & Page, 2019; Heineke, 2013; Hu & van Veen, 2020; Kraft et al., 2018; McCollum et al., 2013; Yang et al., 2022). To quantify such effects, Kraft et al. (2018) conducted a meta-analysis of teacher coaching programs (N=60) and found pooled effect sizes of 0.49 SD ($p < .001$) and 0.18 SD ($p < .001$) on instruction and student performance, respectively. These results are sizeable and provide evidence for the use of coaching as a means to bring about positive teacher and student outcomes.

There is still limited understanding of *why* coaching is so effective (Didion et al., 2020); Hu & van Veen (2020) suggest that perhaps it is because coaching appeals to the

individual and personal nature of growth, in that it has the capacity to increase PD flexibility and respond to a teacher’s unique needs. There is, however, a wealth of evidence of *what* makes coaching effective. As highlighted in the implicit model of teacher growth, Desimone (2009) outlined five critical features (content focus, active learning, coherence, duration, and collective participation) that should be part of any teacher PD program. In a more recent meta-analytic review of teacher PD, Didion et al. (2020) re-summarized Desimone’s framework into three core features of PD: intensity, relevance, and participation. The three PD features are discussed below along with evidence from coaching studies.

Intensity. Intensity is most often referred to as the number of hours spent participating in PD but may also refer to the duration of the PD (i.e., weeks, months, years). While it is widely acknowledged that intensity matters, there is not consensus on the optimal number of contact hours. For example, a review of teacher PD programs (*N*=6) determined that only programs with more than 14 contact hours showed statistically significant, positive effects on student achievement (Yoon et al., 2007). However, in a review of 28 PD studies, Kennedy (2016) argued that higher intensity did not necessarily translate to higher effectiveness, and Allday et al. (2012) stated that for practical reasons, it is important to examine whether less intensive training can work. When looking at coaching specifically, Pianta et al. (2014) found a ceiling effect of coaching intensity in a study involving 170 preschool teachers. Further, using evidence from a review of early childhood coaching studies (*N*=53), Elek & Page (2019) argued that dosage may be dependent on context, i.e., discrete skills may require less time to learn than more complex instructional techniques, and coaching design should be sensitive to the goals of the coaching. In sum, intensity is an important consideration when designing a coaching PD, and the time to acquire the specific target skills must be factored in. The present study is rather low intensity (6-10 hours over 5-6 weeks), but we aimed to examine whether a discrete skill (precise praise) could be trained with rather low time commitment from teachers. Such research is needed, as teachers report time as one of their biggest barriers to PD participation (see Section 2.8).

Relevance. Relevance refers to the significance toward the teacher’s instructional practice and beliefs, also referred to as coherence (Desimone, 2009; Didion et al., 2020). Uptake of target strategies is likely to be much higher when PD is relevant and meaningful toward teachers’ own practices (Dingle et al., 2011). For example, in two different studies that involved coaching, researchers cited coaching that responded directly to what was happening in individual teachers’ classrooms as key to the success of the programs (Downer et al., 2011; McCollum et al., 2013). It is possible that coaching has an advantage over other PD forms in that coaching can be flexibly adapted to suit the relevant needs of the teacher participants. The coaching scheme of the present study (see Section 3.6.3) was designed to flexibly adapt to a teacher’s needs, with various coaching pathways, in order to increase relevance toward the teacher’s own practice.

Participation. Didion et al. (2020) argued that PD can be strengthened when ‘collaborative learning processes’ are included. Collaborative learning processes include active and/or collective participation modalities. Coaching is inherently a more active form of learning than listening to a lecture, for example, but the specific design features of a coaching program can exist on a spectrum from active to passive learning modes. For example, in a small-scale study of coaching discourse, Heineke (2013) noted that coaching sessions that encouraged more teacher talk promoted greater teacher learning. Additionally, several reviews of teacher PD and coaching studies have cited the importance of coaches who collaborate with teacher participants, and who encourage teachers to be active participants in their growth by promoting self-reflection (Elek & Page, 2019; Kennedy, 2016; Yang et al., 2022). The coaching scheme of the present study included collaborative and prescriptive coaching pathways, with the default being the collaborative pathway in order to involve teachers as key players in their growth.

2.8 Technology-based Coaching Tools

According to the 2013 Teaching and Learning International Survey, time was the most cited barrier to PD for teachers in the U.S. and internationally (OECD, 2014). Cost, lack of incentives, and limited availability of relevant opportunities were also mentioned

among the top reasons. Because PD is necessary for maintaining a highly skilled teacher workforce, we must look for creative solutions to PD barriers. Technology-based coaching tools are becoming an increasingly attractive alternative to more traditional PD modalities. Researchers argue that technology-based coaching is cost-effective, customizable, and efficient, and that it provides greater flexibility to both the teachers and the facilitators (McLeod et al., 2019; Rodgers et al., 2019). Video footage, web-mediated meetings, and virtual courses are some of the most commonly used technology-based coaching tools; below we review the evidence of how these tools can aid and enhance the coaching process.

Video footage. Most coaching programs have an observation phase that involves an in-person classroom observation by the instructional coach. Coaches will generally take written notes or use an observation scale, and then the notes will form the basis of the consultation/feedback phase of the coaching program. Video footage of the classroom can be collected in place of in-person observations, which provides flexibility to the coaches and allows for more ‘in situ’ observations (McLeod et al., 2019). Without the need to travel to various school sites to conduct observations, video footage allows coaches to work with teachers in far-reaching areas who may not normally have the opportunity to participate in PD. Video footage has an additional advantage over in-person observations in that it creates an unbiased record of the teaching that can be used during the feedback and reflection phases of the coaching process. In a small-scale intervention using video footage with pre-service teachers, Rosaen et al. (2008) noted that watching video clips from the classroom helped coaches’ observations be more evidence-based and facilitated specific, detailed ‘noticing’ by the teachers. ‘Noticing’ is a necessary component of critical self-reflection, and Rodgers et al. (2019) argued that video aids self-reflection by allowing teachers to see both exemplars and opportunities for change in video clips selected by the coach.

Web-mediated meetings. Web-mediated meetings can replace face-to-face meetings, common in the feedback/consultation phase of coaching. Studies that used

distance coaching with prekindergarten teachers found that teachers in the distance coaching groups had modest but statistically significant gains on both measures of teacher instruction and student achievement (e.g., Artman-Meeker et al., 2014; Downer et al., 2011). Many researchers find it challenging to scale-up coaching programs (Kennedy, 2016), but in the study conducted by Downer et al. (2011), which involved 161 teachers, the authors noted that the web-mediated approach was successful, scalable, and closely linked to practice. Similar to the advantages of video footage, web-mediated meetings may also help PD to be more time-effective and increase opportunities for teachers to participate in coaching.

Virtual courses. Previously we stated that combining multiple PD formats may be the best way to achieve improved outcomes (Carlisle et al., 2011), and many coaching programs include a workshop or lecture component as an orientation to the program. Some researchers have explored utilizing virtual courses in place of in-person orientation sessions. Virtual courses may take the format of live instructor-led courses, or self-guided video courses. In a large-scale intervention (N=262), where preschool teachers from four U.S. states where randomly assigned to different PD treatment groups, all teachers, regardless of treatment, received access to the same virtual course (Landry et al., 2009). The authors stated that scaling up the PD program across multiple states was made possible by the online modality. Further, the virtual course + coaching condition was found to be most effective at improving instruction and student learning ($p < .01$) (Landry et al., 2009). Virtual courses have the potential to reach a large audience of educators addressing the concern of limited availability of relevant PD opportunities, and when combined with coaching, virtual courses provide a promising approach to effective PD.

The combined usage of video footage, web-mediated meetings, and virtual courses make it possible to design fully remote coaching programs. Remote programs became a necessity throughout the COVID-19 pandemic. Although for this reason the present study was designed to be fully remote, a study examining remote coaching has the potential to also serve a useful role in the field, especially as researchers look to take

coaching programs to scale. Yang et al. (2022) called for future research to “examine the extent to which technology-driven support (e.g., virtual coaching) for coaching early childhood teachers can be effective” and argued that “technological advances have the potential to accelerate the expansion of effective coaching programs” (pp. 2, 37). The present study, while small-scale, adopts a fully remote design that, if proven successful, could easily be adapted to support large quantities of teachers.

2.9 Teachers’ Psychological Need Satisfaction

Teachers have been leaving the profession at an alarming rate in recent years, a trend that has only been exacerbated by the pandemic. A nationwide survey of 3,621 U.S. educators by the National Education Association revealed that 55% of educators are considering leaving the profession earlier than they had planned (GBAO, 2022). Further, the number of new teachers entering the field has dropped, leaving large numbers of vacant positions; data released by the National Center for Education Statistics (NCES) reported that 44% of public schools in the U.S. had at least one open teaching position (NCES, 2022). It is crucial that educational researchers are attuned to the stressors presently facing teachers, and the needs that teachers are communicating, when designing PD programs. While increased pay is certainly a top need shared by teachers, many educators have also expressed desires for greater autonomy, improved training when entering the field, greater access to continued PD, and more occasions to collaborate and build relationships with other educators (Department for Education, 2018; Podolsky et al., 2016). These desires expressed by teachers reflect the basic psychological needs of competence, autonomy, and relatedness, as outlined by SDT, and should be considered in the design of PD programs. The present study is the first, to our knowledge, to measure not only students’ psychological need satisfaction, but also teachers’ own psychological need satisfaction as a product of the PD design.

2.10 The Present Study

The primary aim of the present study was to increase kindergarten teachers' usage of precise praise following a short PD program and investigate the relationships between teachers' change in practice (i.e., increased precise praise usage) and students' psychological need satisfaction. Coaching was employed as the PD strategy utilizing a fully remote design; observations were facilitated via classroom video recordings, orientation to the program took the form of a self-guided video course, and one-on-one coaching sessions occurred over a web-mediated meeting platform. We hypothesized that the coaching program would be successful at increasing teachers' usage of precise praise, even after controlling for their 'expectations for change.' Teachers' expectations for change in their instructional practice were measured at the start of the coaching program and controlled for in analysis. This feature follows that of Gilligan et al. (2020), in which the expectation for the effectiveness of a training was measured and controlled for. Expectations for change in intervention research can be considered similar to the placebo effect, i.e., research participants expect their behavior to change so they change their behavior, but not necessarily as a function of the intervention (Green et al., 2019). Because expectations for change could potentially influence behavioral/instructional changes in the teachers, controlling for participant expectations substantially increases the rigor of our study design.

A video coding scheme was developed for this study to quantify teachers' precise praise usage at baseline, during the intervention, and after the intervention. Additionally, we hypothesized that teachers' change in practice would predict students' psychological need satisfaction measured at follow-up. The hypothesized relationships between teachers' precise praise usage and students' psychological need satisfaction are elaborated upon below.

Competence. Children's need for competence is fostered when the right amount of information is provided to effectively achieve desired outcomes (Ryan & Deci, 200). We hypothesized that precise praise would support a child's need for competence because it would communicate to the child that they are capable, even when faced with challenges.

Additionally, we postulated that precise praise of one child could support the competence need satisfaction of the other children in the classroom by alerting them to strategies and behaviors that promote success. As the study was situated within language/literacy instruction, competence was measured via a standardized assessment of early reading.

Autonomy. Children’s need for autonomy is supported when they feel they have freedom to determine their own actions, rather than being coerced (Ryan & Deci, 2000). There are a number of actions teachers can employ to support student autonomy, one being communicating the value of the activity or the task at hand (Patall et al., 2018; Reeve et al., 2004). We hypothesized that precise praise is autonomy supportive because it would communicate the value of a child’s demonstrated behavior by providing information to the child (and other children in the classroom) of a behavior that they can choose to do again in the future. When teachers support their students’ autonomy needs, the visible indicator is increased classroom engagement (Reeve et al., 2004); accordingly, autonomy need satisfaction was measured by teacher reports of classroom engagement.

Relatedness. Children are more likely to be motivated to learn when they feel like they belong or are connected to a community of learners (Skinner & Belmont, 1993). The quality of the interpersonal relationship between the teacher and children in the classroom is important and can be shown through involvement and affection (Ryan & Deci, 2000). We hypothesized that precise praise would help children feel noticed and valued by their teacher, fostering student-teacher relationships. We also postulated that precise praise would generally promote a positive classroom climate. Relatedness need satisfaction was measured by teacher responses on a student-teacher relationship scale.

As noted above, students’ psychological need satisfaction was measured at the classroom-level, rather than at the individual student-level. This research decision was based on the existing research on teacher praise that indicates that it is still unclear whether the relationship between specific praise and student outcomes translates to an entire classroom, and that future studies are needed that “measure the behavior of the classroom collectively” (Jenkins et al., 2015, p. 473). The present study adds to the

literature by investigating classroom-level benefits of precise praise. If shown to be effective, precise praise has the potential to be promoted as a simple classroom technique that can impact a wide range of students.

The secondary aim of the study was to investigate teachers’ own psychological need satisfaction based on their experiences in the coaching program. The coaching scheme, adapted from Hu & van Veen (2020), included phases of reflection, praise, critique, and experimentation, and question prompts in each phase were purposefully designed to be need supportive. Teachers’ psychological need satisfaction was measured using a theoretically-based questionnaire after the conclusion of the program.

Overall, the present study adds to the research on teacher praise by operationalizing a new definition of praise and exploring if teachers can be successfully trained to incorporate precise praise into their teaching practice following PD that is low dosage and fully remote. We attempt to understand the relationship between teachers’ precise praise usage and students’ psychological need satisfaction, in accordance with SDT, and we also measure teachers’ own psychological need satisfaction.

Chapter 3: Method

3.1 Study Aims

The aim of this study was to explore kindergarten teachers’ utilization of ‘precise praise’ following a short PD program, as well as to investigate students’ psychological need satisfaction as a function of teachers’ precise praise usage. Specifically, the study examined the relationship between teachers’ change in practice (i.e., increased precise praise usage) and their students’ literacy performance, classroom engagement, and relationships with their teacher. In doing so, this study considers the potential of precise praise as a teaching technique to meet students’ basic psychological needs of competence, autonomy, and relatedness, in accordance with SDT (Deci & Ryan, 2008). Further, this study addresses a gap in the literature by considering teachers’ own needs for competence, autonomy, and relatedness, by designing a PD program built on the aforementioned principles.

3.1.1 Research Questions

The research questions for this study were:

1. Is there a change in kindergarten teachers’ utilization of precise praise following their participation in a short PD program that includes a self-guided video course, coaching, and classroom video footage?
    i. Do some teachers respond better to the program than others? Specifically, do teaching experience, degree status, prior familiarity with precise praise, and classroom management confidence predict differences in teachers’ utilization of precise praise following the conclusion of the program?
    ii. Is there a main effect of time on teachers’ precise praise usage even after controlling for teachers’ own expectations for change?
2. Is teachers’ change in practice (i.e., increased use of precise praise) related to students’ psychological needs satisfaction of competence, autonomy, and relatedness?

   i. Does increased use of precise praise predict students’ competency as measured on a standardized literacy assessment?
   ii. Does teachers’ use of precise praise predict students’ autonomy as measured by teacher reports of classroom engagement?
   iii. Does teachers’ use of precise praise predict students’ relatedness as measured by teacher reports of student-teacher relationships?
3. Do teacher participants report experiencing their own needs of competency, autonomy, and relatedness as met during the PD program?

3.1.2 Philosophical Underpinnings

The student researcher is a former schoolteacher and principal, and as such, has adopted a pragmatic philosophy to research design and methodology. The balance between opportunities for teacher professional growth and practical PD within the demands of a teaching schedule heavily guided the development of the PD program on precise praise. A range of methods were utilized, such as a self-guided video course, remote coaching, and video observations, with an emphasis on practical outcomes relevant to teachers’ own practices (e.g., knowledge of a new skill). Heron (1996) argues that researchers demonstrate ‘axiological skill’ when they can articulate their values as a basis for what they are researching and how they are researching it. We have opted to make these philosophical perspectives explicit in order to reveal assumptions that were made about the research and choices that were applied to the purpose and design of the research.

3.2 Research Design

This study adopted a repeated-measures, within-subjects design to investigate teachers’ change in practice and classroom-level effects following a short PD program on precise praise. Additionally, a between-subjects design was used to investigate if there were any differences in uptake of the target strategy (precise praise) based on teacher characteristics. Using a video coding scheme developed for this study (see Section 3.4.1), precise praise usage was determined from classroom video footage taken at multiple

time-points. We also looked at teachers’ change in practice (i.e., the difference in their precise praise usage from baseline to follow-up), as teachers’ change in practice is what is likely to be impactful to students.

3.3 Participants

Participants were general-education kindergarten teachers teaching in public-charter schools in the southern and southwestern regions of the U.S. Public-charter schools are government-funded schools that are free and open to the public, but they operate independently from the state or district school system. Teacher participants came from seven elementary schools within the same public-charter school system, and thus they all utilized the same curriculum. In the U.S., kindergarten is the first year of formal schooling. Children typically start kindergarten when they are five years of age, but a family can apply for their child to start kindergarten one-year early. As such, it is not uncommon for American kindergarten classrooms to have a mix of children ranging from four to six years old.

3.3.1 Recruitment

The student researcher had an existing relationship with the participating school system. Senior level management was approached, and written permission was provided to the student researcher to reach out to the school principals. All school principals in the school system that had kindergarten as a grade-level at their school were contacted via email, and those that agreed to have their kindergarten teachers participate in the study circulated an interest form. Teachers who expressed interest were contacted by the student researcher via email. The teachers were provided with an information sheet (see Appendix A) and a digitized informed consent form (see Appendix B). While the PD program was designed to be sensitive to teachers’ time demands, it did still require a commitment outside of regular teaching duties, as well as usage of classroom video footage, which could be considered intrusive. Accordingly, an opt-in approach was utilized for the teacher participants. There were no exclusionary criteria to participation

in the program. Three of the teacher participants had existing professional relationships with the student researcher.

Classroom-level data for student outcome measures was summary data (i.e., no individual student-level data was generated or provided). The focus of this study was on the teachers, and video recordings were part of regular, mandated lessons. Accordingly, student participation in the teachers’ recorded lessons followed an opt-out approach. Families of children in classrooms of participating teachers were provided with an information sheet (see Appendix C) and a link to a digitized opt-out form (see Appendix D). One family chose to opt-out their child from participation in the study, and the student researcher and the child’s teacher worked together to make sure that the student was positioned in the classroom so that their incidental appearance in the video footage could be completely avoided.

3.3.2 Demographic and Background Information

Prior to the start of the study, all participating teachers were asked to complete a *Teacher and Classroom Characteristics Survey* (TCCS) developed specifically for this study to collect information on teacher demographics, teaching backgrounds, and classroom-level characteristics. The teacher participants (N=13) were all females holding at least a bachelor’s level degree, with five participants holding a master’s level degree. Four teachers indicated that they had taught for less than 3 years, five teachers had been teaching for 3-9 years, and four teachers indicated they had been teaching for 10 or more years. Teachers were asked about their experiences with PD, and their prior knowledge of precise praise. Eleven of the thirteen teachers reported participating in PD no more than three times per year. Two teachers reported participating in weekly PD, but it is likely this referred to participation in weekly faculty/staff meetings. Seven teacher participants had either never heard of the term ‘precise praise’ or had heard of the term but did not know the meaning. Of the remaining six participants, five participants reported being somewhat familiar with the meaning of precise praise and one participant reported being very familiar with the meaning.

3.3.3 Teaching Confidence: Curriculum and Classroom Management

To better understand the participants’ teaching confidence going into the program, teachers were asked about their familiarity with the language/literacy curriculum and their confidence with classroom management. Teachers were asked to report on how familiar they were with the concepts covered in the language/literacy curriculum on a scale of 0 (no prior knowledge) to 10 (expert); responses ranged from 8-10 (M=8.62, SD=0.65). The high mean score is not too surprising as teachers in this school system are required to undergo an intensive summer training on the language/literacy curriculum. Teachers were also asked how confident they feel managing the behavioral and social/emotional needs of their class on a scale of 0 (not at all confident) to 10 (extremely confident); responses ranged from 7-10 (M=8.15, SD=1.07).

3.3.4 Classroom Characteristics

Teacher participants were asked to report on information about the students in their classroom. Class size ranged from 18-32 students (M=27.85, SD=4.02). Teachers reported having 0-4 students receiving special education services (M=1.31, SD=1.44), and 0-6 English Language Learners (M=2.92, SD=1.94) in their classes. As kindergarten is the first formal year of schooling, the number of students initially identified as having special education needs is often low and may not be a true reflection of the actual number of students with additional needs.

3.4 Measures

3.4.1 Precise Praise Usage

Teachers took video recordings of their language/literacy instruction throughout and after the program (see Section 3.6.2), and the videos were analyzed to quantify the teachers’ precise praise usage. A coding scheme developed for this study coded feedback statements for feedback category, antecedent, type, and setting. The codes are elaborated upon below, and the complete coding scheme is presented in Appendix E.

Feedback category. Feedback statements to students were categorized as precise praise, positive feedback, or negative feedback. Precise praise is a specific praise statement that communicates information to the student (e.g., “Max is being a respectful student by listening to his peers and waiting for his turn to speak. Great job, Max!”). Positive feedback is defined as non-specific praise statements or statements of approval (e.g., “You’re so smart! or “Good job!”). Negative feedback is defined as any statement of disapproval in response to a behavior or action (e.g., “Stop calling out. I told you to raise your hand.”). Clarifications, instructions, or reminders were not coded as negative feedback (e.g., “No, that’s not the right answer” or “Put your paper down and sit over here, please”). At times, teachers used pre-defined, short statements to communicate information to their students. An example of this is acknowledging a student for sitting like a ‘STAR,’ where star stands for ‘sitting up straight, tracking the speaker, asking/answering questions, and respectful hands and feet.’ Statements where it was clear an acronym was being used to quickly communicate information already understood by the children in the class were coded as precise praise.

Antecedent. Following the way in which SDT outlines motivation for learning, each feedback statement was coded as autonomous or controlled. Autonomous statements are not tied to a reward or threat and provide genuine feedback on a student’s behavior(s) to acknowledge and/or correct. Controlled statements are linked to a reward (e.g., points, tokens, prizes) or a threat (e.g., loss of points, removal of a privilege). An example of a controlled statement is, “I’m looking for a student who will get a scholar dollar. Mia, you are listening, so you get a dollar!”

Type. Feedback statements were coded as to whether they acknowledged an academic behavior or a social-emotional behavior. Academic behaviors are actions or strategies used to respond to questions or attempt academic tasks (e.g., using resources available to answer a question; blending sounds to read a word). Social-emotional behaviors are actions that promote (or detract from) a positive classroom environment

(e.g., following instructions, sharing materials, persevering; or talking over a peer, kicking legs on the carpet).

Setting. Feedback statements were coded for whether they were delivered to an individual student, or to a group of students.

3.4.1.1 Calculation of Precise Praise Usage. Intra-teacher percentages (i.e., proportions) of precise praise, positive feedback, and negative feedback usage were calculated for each video recording. For example, if a teacher gave 20 feedback statements to students during an instructional period, and 3 of those statements were coded as precise praise, the teacher’s precise praise usage would be calculated as 0.15, or 15%. This calculation method follows that of Wallace et al. (2014), in which a target teaching behavior was identified, and the frequency of practices meeting a certain criterion was calculated as a percentage of the total. This method had several advantages. First, because video length varied, we would expect longer recordings to contain more feedback statements than shorter recordings, so by calculating intra-teacher percentages, video length could be controlled for. Second, the aim of this study was not necessarily to increase the amount of feedback that teachers gave to their students, but rather to encourage teachers to be mindful of the *type* of feedback that they provided to their students. Accordingly, intra-teacher percentages made more sense than taking simple frequency counts of praise statements (e.g., Caldarella et al., 2020). In addition to proportions, rates of feedback statements per hour were also determined. For example, if three precise praise statements were given in a 15-minute observation, the teacher’s precise praise rate for that time-point would be calculated as 12 statements/hour.

3.4.1.2 Coding Pilot. The four codes (category, antecedent, type, setting) were established a priori, as well as an additional fifth code (topic). Two videos were coded as a pilot, and adjustments were made to the coding scheme following the pilot, which included deletion of the ‘topic’ code. A full description of the coding pilot is available in Appendix E.

3.4.1.3 Interobserver Agreement. Two postgraduate students in education served as independent coders (referred to later as coder A and coder B). Following a training on the coding scheme, the coders were provided with one classroom video to code as a practice trial, after which the independent coders met with the student researcher to discuss their codes and any disagreements. After the practice trial, the independent coders were provided with a subset of the classroom videos (17%) to code in accordance with the coding scheme. Interobserver agreement (IOA) was calculated between the student researcher and each of the independent coders.

3.4.2 Student Literacy Performance

Students’ performance on a standardized assessment of early reading was used as a measure of competence. All participating schools use the same external testing platform to measure students’ academic progress at three time-points during the school year (Fall-August/September, Winter-December/January, and Spring-May/June). The early reading assessment is a composite score of subtests measuring letter sounds, onset sounds, word segmenting, nonsense words, and sight word reading. Teachers’ class averages on the Winter and Spring early reading assessments were used as measures of student academic performance before and after the teacher PD program. Winter assessment (i.e., pre-test) occurred 3-4 months prior to the start of the PD program, and Spring assessment (i.e., post-test) occurred 1-2 weeks after the conclusion of the PD program. Teachers were informed in the information sheet that we would request their class’s performance and they consented to the collection of this data.

3.4.3 Classroom Engagement

A high level of classroom engagement is arguably an indication of autonomy-supportive teaching practices (Reeve et al., 2004), so to measure student autonomy, teacher responses on an adapted version of the *Classroom Engagement Scale* (CES; Barghaus et al., 2021) were collected before and after the PD program. We considered collecting student reports of autonomy-supportive teacher practices but given the very

young ages of the children (4-to-6-year-olds), we opted for teacher reports instead. The CES taps into both academic and social engagement and was validated on a large sample of U.S. kindergarten students (*N*=12,931). Teachers respond to 14 questions on a trichotomous rating scale, and an overall score is composed from an average of the responses. As reported by Barghaus et al. (2021), multilevel exploratory factor analysis indicated that the one-factor model produced an adequate fit (Cronbach’s $\alpha = 0.974$), and hierarchical linear modelling demonstrated concurrent validity of the CES with measures of academic and behavioral outcomes ($p < .001$).

An adapted version of the CES was created for this study. Because one of the values of the precise praise program was practical PD that could easily fit within a teacher’s schedule, the CES scale was adapted to be collected at the classroom-level, rather than at the individual student-level. Further, we hypothesized that precise praise, even given at the individual student-level, could potentially benefit all students in the classroom, so we were keen to gauge overall classroom engagement, rather than individual student engagement scores. The questions were altered to represent plural children (e.g., the original CES item “The child shows a positive attitude toward learning” was modified to: “The children show positive attitudes toward learning”). When responding to questions, teachers were asked to think about the children in their classroom *in general*. Additionally, to align with the scale used for measuring student-teacher relationships, the scale was adapted from a trichotomous scale to a five-point Likert-scale, with response options ranging from 1 (definitely does not apply) to 5 (definitely applies). Responses to the 14-items were averaged to give overall classroom engagement scores at two time-points. The adapted CES is available in Appendix F. We believe this adapted version is one of the first scales of its kind to quickly measure teacher reports of kindergarten student engagement at the classroom-level.

3.4.4 Student-Teacher Relationships

The *Student Teacher Relationship Scale-Short Form* (STRS-SF; Pianta, 2001) was used as a measure of teacher reports of their relationships with their students before

and after the PD program. STRS-SF is a 15-item questionnaire that measures a teacher’s relationship with an individual child, evaluating both ‘closeness’ (e.g., I share an affectionate, warm relationship with this child) and ‘conflict’ (e.g., This child and I always seem to be struggling with each other). Questions utilize a five-point Likert-scale with response options ranging from 1 (definitely does not apply) to 5 (definitely applies). In a study that looked at teacher-children relationships among U.S. preschool teachers, Whitaker et al. (2015) created a modified version of the STRS-SF to be used at the classroom-level, rather than at the individual child level. Again, this matched with the values and needs of our study, so the modified version was selected. The modified version of the STRS-SF was made in conjunction with the authors of the original scale; changes included altering the word “child” to “children” and using plural verbs and modifiers in place of singular ones (Whitaker et al., 2015). Cronbach’s α of the modified conflict and closeness scales was .73 and .72, respectively (Whitaker et al., 2015). When responding to questions, teachers were asked to think about their relationships with the children in their classroom *in general*. Responses to the conflict items were reverse-coded, and the 15-items were averaged to give overall student-teacher relationship scores at two time-points. The modified STRS-SF is available in Appendix G.

3.4.5 Teachers’ Expectations for Change

Before the PD program began, teachers were asked to report on their expectations for change following their participation in the program. On a scale of 0 (not at all) to 10 (a great deal), teacher responses for how much they expected their teaching practice to change ranged from 6-10 (M=8.00, SD=1.47).

3.4.6 Teachers’ Psychological Need Satisfaction

Our third research question considered teachers’ own psychological need satisfaction of competence, autonomy, and relatedness. To measure need satisfaction, teachers completed the *Basic Psychological Need Satisfaction and Frustration Scale* (BPNSFS; Van der Kaap-Deeder, 2020) at the end of the PD program. The 24-item scale

consists of six subscales that measure satisfaction and frustration of competence, autonomy, and relatedness, using a 5-point Likert-scale. The scale was validated on participants from four culturally diverse countries (Belgium, China, USA, and Peru; total N=1,051), and correlations among satisfaction and frustration of the three psychological needs were all significant in the expected directions ($p < .01$) (Chen et al., 2015). The BPNSFS was adapted by Aelterman et al. (2016) to create a domain-specific version for training contexts; the training version of BPNSFS is publicly available in English and Dutch but has not yet been formally validated. We used the training version of the BPNSFS as the basis for own adaptation. As some of the scale items were not deemed relevant for our study as it was an individual program rather than a group program (e.g., “I felt that I belonged to the group of participants”), one item in each of the six domains was removed, resulting in an 18-item questionnaire. For remaining items that referred to a group, ‘other participants’ was replaced with ‘the facilitator’ (e.g., “I felt close and connected to the other participants” was adjusted to read: “I felt close and connected to the facilitator”). Responses to the frustration items were reverse-coded, and scores for overall autonomy, relatedness, and competence were calculated by averaging the responses of each need. The adapted BPNSFS is available in Appendix H.

3.5 PD Materials

A self-guided video course was designed for this study. The video course was built in Microsoft PowerPoint and uploaded to YouTube via a secure link that was shared with the teacher participants. The video course had three learning objectives: (1) introduce SDT; (2) define ‘precise praise;’ and (3) explore the relationship between precise praise and SDT in the classroom. A classroom example (see Figure 5) was studied throughout the video course, and teachers were provided with opportunities to reflect on the presented ideas, analyze the example, and check their understanding of the concepts. The video course was piloted with a former colleague of the student researcher who has experience working in elementary schools as a teacher and school administrator (the pilot participant was not one of the teachers participating in the study). Feedback

provided over email deemed the video course to be effective at explaining the concepts presented, as well as at illustrating the link between SDT and precise praise. Microsoft Teams was utilized for the virtual coaching sessions. Email was also used to facilitate communication between the student researcher and the teacher participants.

Figure 5

Screenshot from the Self-Guided Video Course

Note. The picture above is part of the classroom example that was presented throughout the video course. Here, the teacher is shown delivering precise praise to a student. The ‘thought bubbles’ surrounding the student illustrate how precise praise can meet a student’s basic psychological needs.

3.6 Procedure

3.6.1 Modality

Due to ongoing health and safety concerns from the COVID-19 pandemic, we opted for a fully virtual format for this study. Though this format was decided out of necessity, we believe it offered a unique opportunity for exploring remote PD designs. In-person classroom observations by an unfamiliar observer are quite intrusive and may substantially alter the teacher’s and/or the students’ behaviors. While filming may have been a change to the normal classroom routine, teacher participants were able to discreetly set-up their phones on the provided tripods rather than have an additional individual in the room to record the class. We believe this increased the ecological validity of the classroom observations by more organically capturing the classroom environment. Additionally, because the coaching sessions also took a virtual format, teachers had greater flexibility with when and where they completed aspects of the program.

3.6.2 Classroom Video Recordings

Teachers were provided with a phone tripod and used their personal cell phones to complete the classroom recordings. Teachers were told to record only during periods of direct instruction (i.e., teaching content or leading an activity) during the language/literacy block. Teachers were instructed to set-up the camera so that they were the focus of the video and could be seen and heard, making sure to avoid any students who had opted-out from participation in the study in the sightline of the recording. The teachers were asked to teach just as they normally would, and record for the entirety of a direct instruction period, i.e., up until they transitioned to the next instructional activity. As such, the length of video recordings varied (generally between 5-20 minutes). Videos were uploaded to a secure folder shared with the student researcher.

3.6.3 The Professional Development Program

Figure 6 below is an overview of the precise praise PD program. The program lasted for 5-6-weeks and consisted of three phases. During phase 1 (baseline), teachers were provided with the teacher information sheet, informed consent, and parent/guardian

information sheet. Once the informed consent form was returned signed, teachers were instructed to share the parent/guardian information sheet and student opt-out form with their students' families via their weekly classroom newsletter. Families were asked to return the opt-out form within one week of its receipt if they wanted to opt-out their child from the study, but opt-out forms were accepted at any point during the baseline and intervention phases. Next, teachers were provided with the TCCS, CES, and STRS-SF, and then were given instructions to complete their two baseline classroom recordings. At this point, teachers knew they were participating in a PD program on feedback/praise, but they had not yet received any instruction or coaching.

Figure 6

Overview of the Precise Praise Professional Development Program

Phase 1: Baseline (2 weeks)	Phase 2: Intervention (2-3 weeks)	Phase 3: Follow-up (1 week)
Distribute: Teacher information sheet & consent form, parent/guardian information sheet, student opt-out form, phone tripod **Collect**: TCCS, winter literacy scores, CES, STRS-SF, classroom recordings (x2)	**Part A**: Self-guided video course, followed by third classroom recording **Part B**: Coaching session #1, using third recording as guide, followed by fourth classroom recording **Part C**: Coaching session #2, using fourth recording as guide	**Collect**: Classroom recording (x1), spring literacy scores, CES, STRS-SF, BPNSFS **Distribute**: Take-home resource pack and PD certificate

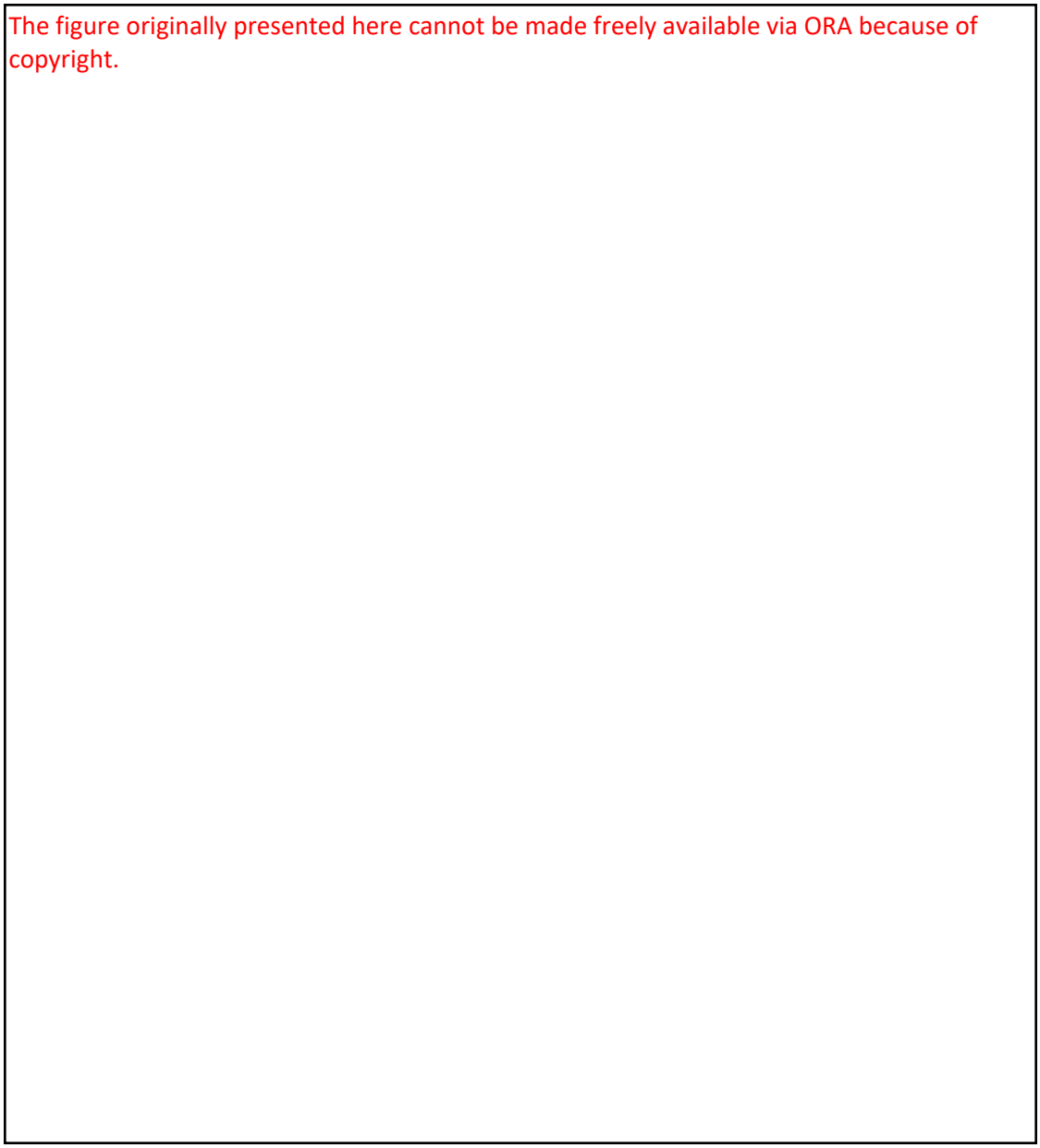
After the baseline classroom recordings had been uploaded, teachers moved to phase 2 of the program (intervention). The intervention consisted of three parts: one self-guided video course (Part A) and two live, virtual coaching sessions (Parts B and C). Time was built into the program to allow for reflection and experimentation in-between each of the parts, and as the program was designed to be flexible to teachers' schedules, the length of the intervention phase ranged from 2-3-weeks. After the video course (Part A), teachers were asked to reflect on what they had learned, consider how precise praise

could be incorporated into their teaching practice, and record the third classroom recording.

Parts B and C of the intervention were individual coaching sessions. The coaching sessions followed the flowchart shown in Figure 7, adapted from an observation-based coaching study conducted by Hu & van Veen (2020). The teachers’ most recent classroom recording was used as the focus of the coaching sessions, and the coach would view the relevant recording and take notes prior to the sessions. Coaching sessions began with a few minutes of social conversation; this helped establish the relationship between the coach and the teacher and allowed the teacher to feel more at-ease in the conversation. After initial conversation, the coach prompted the teacher to reflect on their most recent recording (e.g., “Tell me about your lesson. How did you feel about it?”). This step aimed to support teacher autonomy and allowed space for the teacher to exercise self-awareness. Next, the coach offered the teacher praise (e.g., “Last week we talked about ___, and I saw it perfectly incorporated into your teaching when you did ___.”). This step aimed to build confidence in the teacher’s own competencies and strengthen the teacher/coach relationship. Lastly, the coach displayed a pre-selected video clip from the classroom recording that presented an opportunity for change, and then facilitated a discussion around the clip. Discussion could follow two pathways, collaborative or prescriptive, and the subsequent turn-taking could fluctuate between the two pathways. The coach always initially defaulted to the collaborative pathway (e.g., “What did you notice in this video clip?”) but would move toward the prescriptive pathway (e.g., “When you said ___, the student responded by doing ___.”) if the teacher required more guidance or direction. Here, the objective was to increase the teacher’s awareness of a problem or an opportunity for change, and to strengthen the teacher’s competencies in using precise praise. At the end of each coaching session, the teacher was asked if they had any questions or anything else they would like to talk about. Finally, the teacher was asked to spend some time reflecting upon the coaching discussion and experimenting with their teaching practice, and then complete another classroom recording.

Figure 7

Flowchart of Coaching Pathways



Note. The figure above illustrates the framework that was used during the one-on-one coaching sessions. Adaptation included adjustment of teacher and coach actions and arrow pathways, and the incorporation of video footage into the coaching sessions. Figure adapted from “Decomposing the observation-based coaching process: The role of coaches in supporting teacher learning,” by Y. Hu & K. van Veen, 2020, *Teachers and Teaching, 26*(3-4), p. 291.

In phase 3 of the program, at a 1-week follow-up from the conclusion of the PD program, teachers took their final classroom recording and completed the BPNSFS, as well as the CES and STRS-SF for a second time. Teachers were notified that the questions in the CES and STRS-SF would be familiar from when completed during the baseline phase, but this time they should reflect on their experiences with their students over the past month (i.e., since the PD program began). All teacher participants were provided with a take-home resource pack of precise praise materials and a PD certificate (see Appendix I) as a thank-you for their participation in the program.

3.7 Ethical Considerations

This study was granted approval by the Central University Research Ethics Committee (CUREC) (Appendix J). The student researcher completed an online course in research integrity and had also previously received professional training in coaching teachers. For this study, a local review was not considered necessary as the study was a straightforward, short-term research project, and permission for school participation had been granted directly from senior school officials. When responding to questionnaires/scales and uploading video recordings, teachers used unique ID numbers, and their data was pseudonymized. The research data was stored on the student researcher’s university account on a password protected personal laptop computer, and identifying information was destroyed at the conclusion of the study.

Chapter 4: Results

The aim of this study was to explore the effectiveness at increasing teachers’ usage of ‘precise praise’ following a short PD program, and to investigate student and teacher psychological need satisfaction following the conclusion of the program. The research questions were as follows:

1. Is there a change in kindergarten teachers’ utilization of precise praise following their participation in a short PD program that includes a self-guided video course, coaching, and classroom video footage?
    i. Do some teachers respond better to the program than others? Specifically, do teaching experience, degree status, prior familiarity with precise praise, and classroom management confidence predict differences in teachers’ utilization of precise praise following the conclusion of the program?
    ii. Is there a main effect of time on teachers’ precise praise usage even after controlling for teachers’ own expectations for change?
2. Is teachers’ change in practice (i.e., increased use of precise praise) related to students’ psychological needs satisfaction of competence, autonomy, and relatedness?
    i. Does increased use of precise praise predict students’ competency as measured on a standardized literacy assessment?
    ii. Does teachers’ use of precise praise predict students’ autonomy as measured by teacher reports of classroom engagement?
    iii. Does teachers’ use of precise praise predict students’ relatedness, as measured by teacher reports of student-teacher relationships?
3. Do teacher participants report experiencing their own needs of competency, autonomy, and relatedness as met during the PD program?

It is important to note that this study is exploratory in nature and the sample size was small, so the results must be interpreted with caution. Descriptive statistics from the

videorecorded classroom observations are presented below, followed by the results of each research question.

4.1 Classroom Observations

Trained coders coded the video observations for feedback category (precise praise, positive feedback, negative feedback), antecedent (autonomous, controlled, undetermined), type (academic, social-emotional, mixed), and setting (individual, group, mixed) during language/literacy instruction. Teachers were asked to record their instruction at five time-points: Times 1a and 1b (baseline), Time 2 (after the self-guided video course), Time 3 (after coaching session #1), and Time 4 (after coaching session #2 at a 1-week follow-up). Due to pandemic-related teacher absences, the second baseline recording was skipped for seven teachers, and thus observations at Time 1b are removed from analyses. Accordingly, Time 1a will simply be referred to as ‘Time 1’ moving forward.

A total of 58 observations were completed totaling 725 minutes (12.08 hours) of data. The length of observations ranged from 4.4–22.2 minutes, with the average observation length being 12.5 minutes. Interobserver agreement (IOA) was collected for 17% of the video observations. IOA between the student researcher and coder A was 73.1%, and between the student researcher and coder B was 73.4%.

Table 2

Descriptive Statistics of Teachers' Feedback Statements Across Time

Feedback Measure	Time 1 (*N* = 187)	Time 2 (*N* = 188)	Time 3 (*N* = 193)	Time 4 (*N* = 180)	Total (*N* = 748)
Category[a]					
Precise praise	11 (5.9)	47 (25.0)	44 (22.8)	60 (33.3)	162 (20.7)
Positive feedback	168 (89.8)	138 (73.4)	148 (76.7)	116 (64.4)	570 (76.2)
Negative feedback	8 (4.3)	3 (1.6)	1 (0.5)	4 (2.2)	16 (2.1)
Antecedent					
Autonomous	182 (97.3)	184 (97.9)	192 (99.5)	179 (99.4)	737 (98.5)
Controlled	4 (2.1)	3 (1.6)	1 (0.5)	1 (0.6)	9 (1.2)
Undetermined	1 (0.5)	1 (0.5)	0 (0)	0 (0)	2 (0.3)
Type					
Academic	156 (83.4)	147 (78.2)	150 (77.7)	128 (71.1)	581 (77.7)
Social-emotional	28 (15.0)	38 (20.2)	34 (17.6)	47 (26.1)	147 (19.7)
Mixed	3 (1.6)	3 (1.6)	9 (4.7)	5 (2.8)	20 (2.7)
Setting					
Individual	113 (60.4)	132 (70.2)	138 (71.5)	126 (70.0)	558 (68.0)
Group	68 (36.4)	48 (25.5)	48 (24.9)	47 (26.1)	211 (28.2)
Mixed	6 (3.2)	8 (4.3)	7 (3.6)	7 (3.9)	28 (3.7)

Note. Table shows frequency counts of each feedback code with percentages in parentheses. *N*= number of feedback statements recorded.

[a]Due to minimal feedback statements being coded as 'non-verbal,' verbal and non-verbal statements were combined within both the positive feedback and negative feedback categories.

Descriptive statistics of all feedback statements (*N*=748) are presented in Table 2. Overall, the amount of feedback statements that teachers delivered to their students remained relatively consistent over time, whereas the distribution of feedback among precise praise, positive feedback, and negative feedback categories appeared to change over time (i.e., reducing positive feedback statements in favor of more precise praise statements). The vast majority of feedback statements were coded as autonomous, with controlled statements (e.g., "Let me see who is sitting like a super star and might get a bear buck") occurring in less than 2% of all feedback statements. There were preferences for delivering feedback to academic behaviors (versus social-emotional behaviors) and to individual students (versus groups of students). Rates of teachers' feedback statements

across time-points are presented in Table 3. At baseline, teachers' natural rates of positive feedback were very high compared to their natural rates of precise praise. By the end of the intervention, teachers were, on average, delivering 25.09 precise praise statements per hour.

Table 3

Average Rates per Hour of Teachers' Feedback Statements Across Time

Feedback Category	Rate per Hour			
	Time 1	*Time 2*	*Time 3*	*Time 4*
Precise praise	4.12	15.37	16.80	25.09
Positive feedback	57.88	48.12	65.20	53.45
Negative feedback	2.90	1.18	0.55	1.86

Note. Rates are averages representing all teacher participants (*N*=13). Time 1=baseline, Time 2=after self-guided video course, Time 3=after coaching session #1, and Time 4=after coaching session #2 at 1-week follow-up.

4.2 Teachers' Usage of Precise Praise

4.2.1 Change Over Time

To answer the primary component of the first research question, *'is there a change in kindergarten teachers' utilization of precise praise following their participation in a short PD program?'*, we conducted a repeated-measures analysis of variance (ANOVA). A repeated-measures ANOVA is used when comparing two or more values with the same pre- and post-test, which in this case was measures of precise praise usage across four time-points. The null hypothesis (H_0) assumes that there are no differences in precise praise usage across time-points (i.e., $\mu_{T1}=\mu_{T2}=\mu_{T3}=\mu_{T4}$), while the alternative hypothesis (H_1) asserts that there are statistically significant differences in precise praise usage across time-points (i.e., one or some μ_{Tj} are different). The independent variable, time, is a nominal-scale variable containing four factors (Times 1, 2, 3, and 4), and the dependent variable, precise praise usage, is an interval-scale variable.

To determine precise praise usage, a teacher's feedback statements at each time-point were totaled, and the proportion of feedback statements that were coded as precise praise were calculated for each time-point, resulting in ratio-scale data. Descriptive statistics of precise praise usage at each time-point are presented in Table 4.

Table 4

Descriptive Statistics of Teachers' Precise Praise Usage as Proportions of Total Feedback Statements

Precise Praise	*M* (SD)	Min.	Max.	*Skew*	*Kurtosis*
Time 1	.05 (.06)	.00	.20	1.08	0.51
Time 2	.27 (.16)	.00	.50	-0.09	-1.01
Time 3	.24 (.19)	.00	.60	0.36	-1.03
Time 4	.37 (.17)	.18	.75	1.16	0.85

Note. Acceptable values for skew and kurtosis are generally cited as ±1 and ±3, respectively (Garson, 2012). There were no missing values.

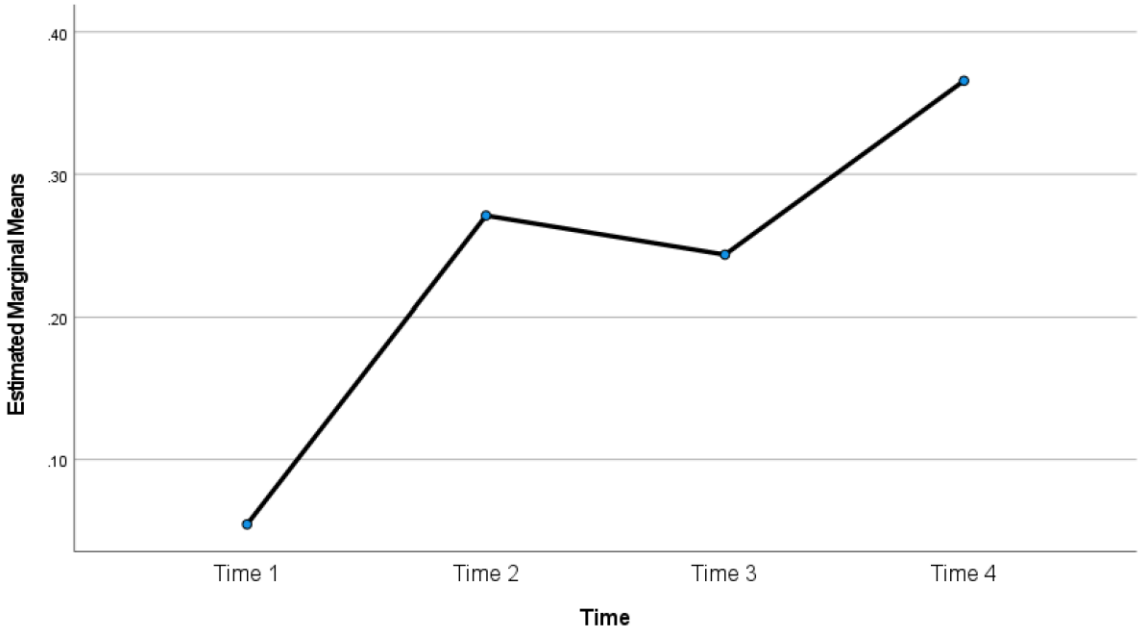
To proceed with the ANOVA, the following assumptions were checked. Inspection of the Q-Q plots of the dependent variable (precise praise usage) at each time-point indicated normal distributions, as did the skew and kurtosis values for all time-points (see Table 4). The assumption of sphericity was not violated according to Mauchly's test of sphericity ($\chi^2(5) = 4.20$, $p = .523$). The assumption of independent observations could be considered violated as teachers were nested within schools; however, Durbin-Watson statistic values close to 2 for all models suggested this was not a concern.

Results of the ANOVA confirmed that there were statistically significant differences in precise praise usage across the four time-points ($F(3, 36) = 11.63$, $p < .001$, $\eta^2 = 0.492$). Simple planned contrasts revealed that the overall change in precise praise usage from baseline to follow-up (Time 1 to 4) was statistically significant ($p < .001$), as were the changes from baseline to after the self-guided video course (Time 1 to 2) ($p <$

.001) and from after the self-guided video course to follow-up (Time 2 to 4) ($p < .05$). Change in practice over time is visualized in Figure 8. In sum, the data shows that teachers’ precise praise usage changed over the 5–6-week period of the precise praise PD program.

Figure 8

Teachers’ Average Precise Praise Usage Across Time



Note. Precise praise usage at each time-point refers to the mean proportion of feedback statements at the given time-point that were coded as precise praise.

4.2.2 Time x Group Analyses

To answer the secondary component of the first research question, *‘do some teachers respond better to the PD program than others?’*, we added various between-subjects factors to our model. We were interested in whether teaching experience, degree

status, prior familiarity with precise praise, or classroom management confidence would impact teachers' uptake of the PD strategies, so four subsequent ANOVAs were conducted, one for each between-subjects factor. We had also collected information on teachers' language/literacy curriculum confidence, but as the values were all very high with little variance, we opted not to pursue it as a between-subjects factor. The null hypothesis (H_0) assumes that levels of precise praise at the time-points are the same in different groups, while the alternative hypothesis (H_1) asserts that the levels of precise praise at the time-points are different in different groups.

Table 5

Descriptive Statistics of Characteristics of Teacher Participants

Between-Subjects Factor	*N*	Count (%)
Teaching experience	13	
Low experience (0-5 years)		6 (46.2)
High experience (6-10+ years)		7 (53.8)
Degree status	13	
Bachelor's degree		8 (61.5)
Master's degree		5 (38.5)
Prior precise praise familiarity	13	
Little to no familiarity		7 (53.8)
Some to high familiarity		6 (46.2)
Classroom management confidence	13	
Lower confidence (0-7)		5 (38.5)
Higher confidence (8-10)		8 (61.5)
Language/literacy curriculum confidence	13	
Lower confidence (0-7)		0 (0.0)
Higher confidence (8-10)		13 (100.0)

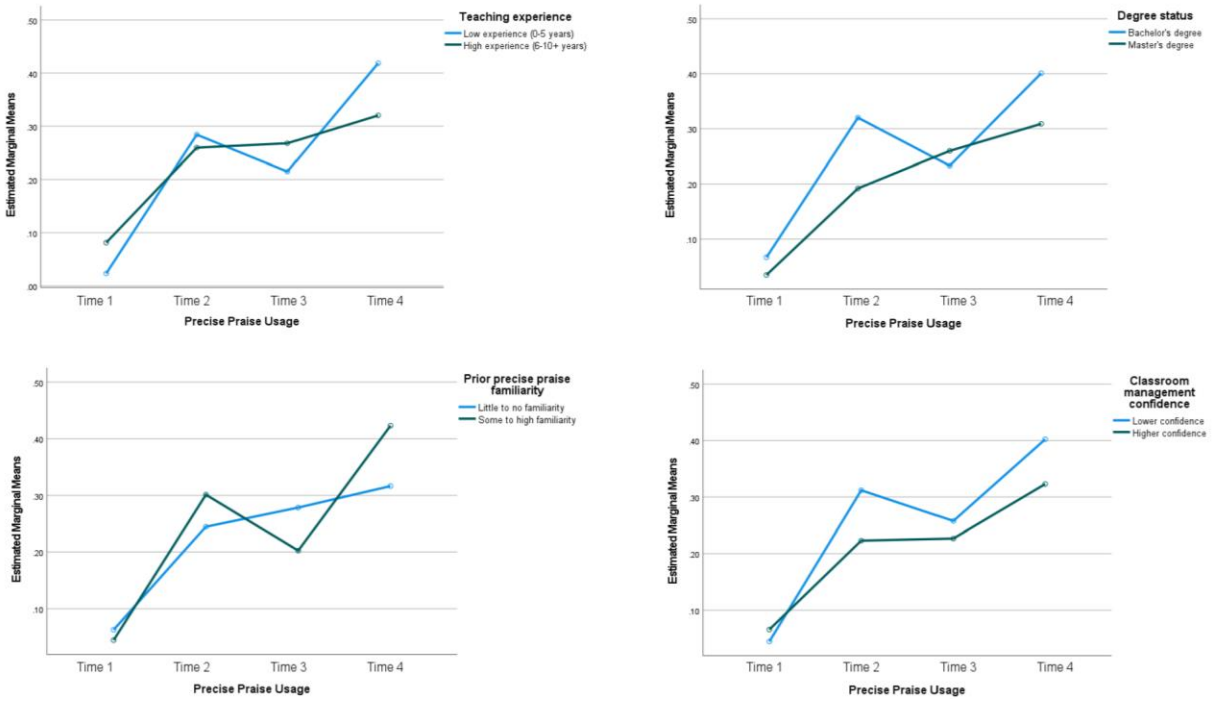
Note. Each teacher characteristic is based on a single-item in the *Teacher and Classroom Characteristics Survey* (TCCS) completed prior to the intervention. Teaching experience (0=Less than 1 year, to 4=10+ years), precise praise familiarity (0=Never heard the term, to 3=Very familiar with the term), classroom management confidence (0=Not at all confident, to 10=Extremely confident), and language/literacy curriculum confidence (0=No prior knowledge, to 10=Expert) were dichotomized into low/high groups for the purpose of this analysis.

In addition to the normality checks and assumptions covered in Section 4.2.1, the following additional assumptions were checked. The assumption of homogeneity of variance was not violated for any of the between-subjects factors according to Levene’s test ($p > .05$ for each time-point). The assumption of sphericity was also not violated for any of the between-subjects factors according to Mauchly’s test (all $p > .05$).

Results of the ANOVAs revealed that there were no significant interaction effects between precise praise usage and any of the between-subjects factors: teaching experience ($F(3, 33) = 0.924$, $p = .440$, $\eta^2 = .078$); degree status ($F(3, 33) = .736$, $p = .538$, $\eta^2 = .063$); prior precise praise familiarity ($F(3, 33) = 1.116$, $p = .357$, $\eta^2 = .092$); and classroom management confidence ($F(3, 33) = .413$, $p = .745$, $\eta^2 = .036$). For teaching experience, degree status, and classroom management confidence, F values <1 suggested that there was more variance within participants than between participants. For prior precise praise familiarity, the F value was >1, though not statistically significant. In sum, we accept the null hypothesis and conclude that there were no statistically significant differences between different teacher groups and teachers’ precise praise usage (see Figure 9).

Figure 9

Teachers' Average Precise Praise Usage Over Time by Teacher Characteristics



Note. Precise praise usage at each time-point refers to the mean proportion of feedback statements at the given time-point that were coded as precise praise.

4.2.3 Controlling for Expectations for Change

Lastly, we were interested in if there was still a main effect of time on teachers' precise praise usage after controlling for their 'expectations for change.' Before participating in the PD program, teacher participants were asked, *'how much do you expect your teaching practice to change from this PD program?'*, on a scale from 0 (not at all) to 10 (a great deal), with responses ranging from 2-10 (M=8.00, SD=1.47). We conducted a repeated measures ANCOVA with time as the independent variable and precise praise usage as the dependent variable, and we included teachers' expectations for

change as a covariate. As there were no significant interaction effects for any of the between-subjects factors, they were not included in the analysis.

In addition to the normality checks and assumptions covered in Section 4.2.1, the following additional assumptions were checked for an ANCOVA. The assumption of sphericity was not violated according to Mauchly’s test of sphericity ($\chi^2(5) = 4.87$, $p = .434$). Our covariate, though an ordinal-scale variable, was treated as interval-scale data as the following conditions were true: (1) the variable contained at least five populated categories; (2) the variable was approximately normally distributed according to inspection of the histogram, and skew and kurtosis values (0.19 and -1.40, respectively); and (3) the variable had an approximately linear relationship with the outcome. Lastly, the covariate was collected prior to the intervention and is unrelated to the independent variable, time.

The covariate (expectations for change) was mean-centered to reduce Type-I error rates (Schneider et al., 2015). The results of the ANCOVA revealed that there was still a main effect of time on teachers’ precise praise usage, even after controlling for their expectations for change: $F(3, 33) = 12.99$, $p < .001$, $\eta^2 = .541$. The interaction effect between teachers’ precise praise usage and their expectations for change was not significant: $F(3, 33) = 2.41$, $p = .085$, $\eta^2 = .179$. Unadjusted and covariate adjusted descriptive statistics of teachers’ precise praise usage are presented in Table 6. In sum, there is sufficient evidence to conclude that there are statistically significant differences in teachers’ precise praise usage across time-points, even after controlling for teachers’ own expectations for change.

Table 6

Unadjusted and Covariate-Adjusted Descriptive Statistics for Teachers' Precise Praise Usage

Time	Precise Praise Usage (Unadjusted)		Precise Praise Usage (Adjusted)	
	Mean	*SE*	*Mean*	*SE*
Time 1	.054	.018	.054	.016
Time 2	.271	.045	.271	.045
Time 3	.244	.054	.244	.056
Time 4	.366	.046	.366	.039

Note. Precise praise usage at each time-point refers to the mean proportion of feedback statements at the given time-point that were coded as precise praise. There were no missing values.

4.3 Students' Psychological Need Satisfaction

For our second research question, we were interested in whether teachers' change in practice predicted students' psychological need satisfaction. To answer this question, we ran three separate multiple linear regressions, one for each outcome variable (all continuous-scale) collected at follow-up: (1) literacy performance (i.e., competence); (2) classroom engagement (i.e., autonomy); and (3) student-teacher relationships (i.e., relatedness). Our predictor variables were teachers' change in practice (i.e., the difference in precise praise usage from baseline to follow-up) and the relevant student measure collected at baseline (i.e., literacy performance, engagement, or relationships). Teachers' change in practice was selected as the predictor variable rather than just teachers' precise praise usage at follow-up because the change in practice was likely to be most impactful to the students. Multiple linear regression models the relationship between multiple predictor variables and a continuous outcome variable, and as we were concerned with only two time-points for this analysis, i.e., baseline and follow-up, multiple linear regression was appropriate. Descriptive statistics of the predictor and outcome variables are presented in Table 7.

Table 7

Descriptive Statistics of Predictor and Outcome Variables for Students' Psychological Need Satisfaction

Measure	*N*	*M* (SD)	*Skew*	*Kurtosis*
Precise praise change[a]	13	0.31 (0.19)	0.96	1.54
Literacy performance[b]				
Baseline	13	59.08 (6.25)	0.43	-0.91
Follow-up	13	74.08 (9.53)	0.62	-0.65
Classroom engagement[c]				
Baseline	13	4.32 (0.43)	0.39	-0.94
Follow-up	13	4.48 (0.40)	-0.59	-0.39
Student-teacher relationships[d]				
Baseline	13	4.41 (0.25)	-0.05	0.02
Follow-up	13	4.52 (0.28)	0.14	-0.88

[a]Precise praise change was calculated as the difference between teachers' precise praise usage at follow-up (time 4) and baseline (time 1). Precise praise usage refers to the mean proportion of feedback statements at the given time-point that were coded as precise praise.

[b]Student literacy performance was measured from a composite score on a standardized assessment of early reading.

[c]Classroom engagement was measured using an adapted version of the *Classroom Engagement Scale* (CES; Barghaus et al., 2021).

[d]Student-teacher relationships were measured with the modified version of the *Student Teacher Relationship Scale-Short Form* (STRS-SF; Pianta, 2001; Whitaker, 2015).

Before proceeding, the following assumptions of multiple linear regression were checked. There were roughly linear relationships between each outcome variable and the predictor variables. Histograms of the predictor variables showed sufficient variation in the values. There did not appear to be any outliers, and the maximum values of Cook's distance were all <1, indicating no cases were having undue influence on the model (apart from one exception, discussed below). Scatterplots of the residuals showed roughly random distributions, indicating the assumption of homoscedasticity had not been violated. There were no issues with multicollinearity of the explanatory values (all tolerance values >0.20; all VIF scores <10), and P-P plots of the residuals indicated they were normally distributed.

4.3.1 Student Literacy Performance (Competence)

There was a statistically significant negative correlation between teachers’ precise praise change and literacy performance at follow-up (r = -.67, p = .006). The regression model predicted 93.7% of the variance in literacy performance (R^2 = .94, F(2, 10) = 73.87, p < .001), with both literacy performance at baseline (t = 8.79, p < .001) and teachers’ change in practice (t = -3.58, p = .005) being significant predictors.

4.3.2 Classroom Engagement (Autonomy)

There was a positive correlation between teachers’ precise praise change and student engagement at follow-up, though it was not statistically significant (r = .31, p = .154). The regression model predicted 75.6% of the variance in classroom engagement (R^2 = .76, F(2, 10) = 15.51, p < .001), though this was largely attributed to classroom engagement at baseline (t = 5.21, p < .001), rather than teachers’ change in practice (t = 0.68, p = .51).

4.3.3 Student-Teacher Relationships (Relatedness)

For student-teacher relationships only, residual statistics revealed that there was one outlier. However, upon further inspection of the outlier, it did not appear to be the result of incorrectly measured or entered data. Further, as this was an exploratory study with a small sample size, it is possible that with a larger sample, the value would not have been an outlier, so it was retained in the sample for analysis. There was a positive correlation between teachers’ precise praise change and student-teacher relationships at follow-up, though not statistically significant (r = .17, p = .285). The regression model predicted 59.1% of the variance in student-teacher relationships (R^2 = .59, F(2, 10) = 7.24, p = .011), though this was largely attributed to student-teacher relationships at baseline (t = 3.71, p = .004), rather than teachers’ change in practice (t = -.24, p = .818).

4.4 Teachers’ Psychological Need Satisfaction

For our final research question, we were interested in whether teacher participants reported experiencing their own needs of competence, autonomy, and relatedness as met during the PD program. Teacher responses on our adapted version of the *Basic Psychological Need Satisfaction and Frustration Scale* (BPNSFS; Van der Kaap-Deeder, 2020), completed after the conclusion of the PD program, are summarized in Table 8. Responses were very high, with mean values ranging from 4.53-4.96 (maximum possible value was 5.0). Additionally, teachers were asked to share their reflections from the PD program on an open-ended question: "*Please share any feedback and/or reflections you have regarding the precise praise program."* Supporting quotes from the teachers that related to feelings of competence, autonomy, or relatedness (as defined by SDT, see Section 2.2.4), are presented in Table 8 as well.

Table 8

Descriptive Statistics of Participating Teachers' Responses on the BPNSFS and Supporting Teacher Quotes (N=13)

Measure	*M (SD)*	Example quotes
Competence	4.53 (.41)	"I think [precise praise] will help with classroom management in the future in many different situations." "I feel more confident using precise praise in the classroom."
Autonomy	4.90 (.23)	"The advice and being able to see/hear feedback on my current practices helped me see and understand how/what changes I needed to make." "I plan to implement this from the beginning to end of next school year, as well as to videotape myself and reflect upon my practice." "I really enjoyed getting feedback based on my actual lessons."
Relatedness	4.96 (.14)	"The facilitator was an excellent communicator and thoroughly guided me through the program." "I thoroughly enjoyed my time with [the facilitator]."

Note. Quantitative responses were collected on an adapted version of the BPNSFS (Van der Kaap-Deeder et al., 2020). Need frustration items were reverse-coded and averaged with the corresponding need satisfaction items (see Chen et al., 2015). Qualitative responses were collected from an open-ended question.

Chapter 5: Discussion

The aim of the present study was to evaluate the effectiveness of increasing kindergarten teachers’ usage of precise praise in the classroom following a short, fully remote PD program. In doing so, we captured teachers’ natural usage of various feedback statements at baseline, as well as their change in practice during and after the coaching intervention. In line with self-determination theory (SDT), we explored whether a teachers’ increased precise praise usage could predict students’ psychological needs satisfaction of competence, autonomy, and relatedness, measured at follow-up via literacy performance, classroom engagement, and student-teacher relationship scores, respectively. Additionally, this study is the first, to our knowledge, to have captured teachers’ own psychological need satisfaction in parallel to the students’ psychological need satisfaction. The findings are discussed along with limitations, implications, and suggestions for future research.

5.1 Interpretation of Findings

5.1.1 Teachers’ Feedback Statements

A coding scheme was developed for this study to categorize teachers’ feedback statements as precise praise, positive feedback, and negative feedback. Because we were concerned with not only agreement on the feedback category (i.e., precise praise, positive feedback, negative feedback) for a given feedback statement, but also agreement on whether a feedback statement at any given time-point occurred at all, we decided that simple interobserver agreement (IOA) metrics between the student researcher and each independent coder would be appropriate for determining the reliability of the novel coding scheme. Given that this was a new coding scheme that attempted to capture a nuanced behavior like feedback, IOA was moderately high. This increases our confidence in the proportion and rate statistics of feedback statements that are reported on in this study.

While our research questions were not primarily concerned with teachers’ natural rates of praise, we were able to ascertain this information given the design of our study. At baseline, teachers’ positive feedback rate was 57.9 statements per hour (89.8% of all feedback statements at baseline were coded as positive feedback). While the natural rate of positive feedback found in our study may seem quite high, it is not that unexpected when compared to other studies that also focused specifically on early education teachers. For example, White (1975) calculated the natural praise rate of early elementary teachers as 43.7, and Floress et al. (2017a) calculated the natural praise rate of preschool teachers as 61.5. Our finding reinforces the fact that general praise usage by early years teachers is typically high, especially when compared to the trend of declining praise usage in the later years (White, 1975). In line with the current literature, which asserts that teachers seldom use specific praise forms in the absence of direct training (Zoder-Martell, 2019), the natural rate of precise praise at baseline for the teachers in our study was only 4.1 statements per hour (only 5.9% of all feedback statements at baseline were coded as precise praise). This finding underlines the need for training programs that specifically instruct teachers on more nuanced classroom management techniques, such as precise praise.

At baseline, teachers in the present study seldom used negative feedback (rate = 2.9; proportion = 4.3%) or controlled statements (proportion = 2.1%). While it is possible that the presence of the camera and participation in a research study altered the teachers’ behaviors, minimal usage of negative feedback and controlled statements may likely be attributed to the way in which the teachers from this sample were trained, as they all teach within the same school system. Accordingly, caution must be drawn when generalizing the findings to teachers from outside of this particular school system. In sum though, the literature base of teachers’ natural praise rates is limited (Drake & Nelson, 2021; Jenkins et al., 2015), especially in the early years (Floress & Jenkins, 2015), and the present study adds to our current understanding of teachers’ natural praise rates. According to Floress & Jenkins (2015), such information is helpful for school

professionals as it can be used as ‘mastery criteria,’ especially when supporting individual teachers with classroom management recommendations.

5.1.2 The Professional Development Program

Findings showed that teachers’ change in precise praise usage over time was statistically significant ($p < .001$), with a very large effect size ($\eta^2 = 0.492$). Specifically, changes from baseline to follow-up (Time 1 to 4), from baseline to after the self-guided video course (Time 1 to 2), and from after the self-guided video course to follow-up (Time 2 to 4) were all statistically significant. This suggests that the self-guided video course was effective, in its own right, at increasing teachers’ precise praise usage, and that there were further increases in teachers’ precise praise usage following the coaching sessions. Given that teacher-reported barriers to PD include time and cost (OECD, 2014), the results of the present study offer promising evidence that well-designed video courses can be used as relatively time- and cost-effective approaches to PD. Self-guided video courses provide teachers with the flexibility of when they choose to partake in PD; video courses can easily be delivered to large audiences of educators, and they are a resource that teachers can continue to come back to as they reflect on and experiment with their teaching practice. That said, the impact of the one-on-one coaching sessions must not be understated. Between the self-guided video course and the measure at follow-up, during which the two coaching sessions occurred, teachers increased their precise praise usage from a rate of 15.4 to 25.1 statements per hour (proportional change of 25% to 33% of all feedback statements). This continued growth during and after the coaching sessions points to the importance of both ‘in situ’ observations (McLeod et al., 2019) and relevant feedback given to teachers on their own teaching practices (Dingle et al., 2011).

The nonsignificant interaction effects of the time *x* group analyses suggested that the precise praise PD program worked equally well for all teachers, regardless of their teaching experience, degree status, prior familiarity with precise praise, or classroom management confidence. This is promising evidence, especially as school leaders and researchers look to design PD that can meet the needs of a heterogenous teacher

workforce (Didion et al., 2020). Research has suggested that coaching is more effective at evoking change in practice than other PD strategies (Kraft & Blazar, 2018; Yang et al., 2022), and it is possible this is true because coaching can flexibly adapt to suit the relevant needs of the participating teachers (Hu & van Veen, 2020). For example, in the present study, while all teachers started on the collaborative coaching pathway, the coach had flexibility to use question prompts from the prescriptive coaching pathway, when needed. This approach acknowledged that the teachers in the program were coming with different experiences, strengths, and weaknesses, while honoring their universal needs for feeling competent and autonomous in their learning journeys. In line with Clarke & Hollingsworth (2002)’s assertion that teacher growth is individual, varied, and personal, we can speculate that our PD program worked equally well for all of the teacher participants because it recognized this nature of growth. That said, all our teacher participants had very high confidence with their language/literacy instruction, which was the target subject of our intervention, so we were unable to test for interaction effects between precise praise usage and instruction confidence. It is possible that our findings would not generalize to teachers with lower instruction confidence, and future research would benefit from investigating how the precise praise PD program translates to teachers with lower instruction confidence, as well as to other subject areas.

Lastly, findings showed that teachers’ change in precise praise usage over the 5–6-week intervention period was still statistically significant, even after controlling for their expectations for change ($p < .001$). This is an important finding, and a unique feature of the present study; by controlling for expectation effects, any causal inferences that may be made from training studies are enhanced (Boot et al., 2013; Gilligan et al., 2020). While we do not attempt to make a causal claim in the present study, the study design affords us more confidence in concluding that participation in the precise praise PD program led to increases in teachers’ precise praise usage.

5.1.3 Students’ Psychological Need Satisfaction

Teachers’ change in practice (i.e., increased precise praise usage) was not a statistically significant predictor of students’ psychological needs satisfaction of competence, autonomy, or relatedness. However, there were positive correlations between teachers’ change in practice and both classroom engagement (i.e., autonomy) and student-teacher relationships (i.e., relatedness) that were approaching significance (r = .31 and .17, respectively). It is possible that teachers’ change in practice would predict students’ psychological need satisfaction had the post-intervention measure occurred at a longer time-delayed follow-up. While the teachers in our program were successful at changing their own behaviors, it is probable that more time was needed for students to notice and react to the instructional changes. For example, previous early education PD programs that found positive impacts on student outcomes took measurements of children’s behaviors 1-2 years after the coaching programs had begun (Landry et al., 2006; Pianta et al., 2017). Secondly, the statistically significant inverse relationship between teachers’ change in practice and students’ literacy performance was surprising. However, we suspect that this inverse relationship may likely be due to compensatory teacher behavior. For example, the teachers of the lower-performing classes may have used more praise as a way of motivating and encouraging their students to ‘catch up’ to their higher-performing peers in other classes/schools. This ‘differential treatment’ has been noted in the literature on special education teachers, where research suggests that special education teachers tend to use more praise statements than their general education counterparts (Derevensky & Leckerman, 1997; Floress et al., 2017b). Future research with longitudinal evidence may help us better understand the unique relationships between teachers’ precise praise usage and their students’ psychological needs satisfaction.

5.1.4 Teachers’ Psychological Need Satisfaction

Teachers’ responses on the *Basic Psychological Need Satisfaction and Frustration Scale* (BPNSFS; Van der Kaap-Deeder, 2020) confirmed that teachers experienced their own psychological needs as met during the PD program (response

means ranged from 4.53-4.96, with the maximum possible value being 5.0). Responses on an open-ended questionnaire provided further support for teachers’ need satisfaction, where feelings of competence, autonomy, and relatedness emerged in the responses. These results provide initial evidence that PD programs can be need satisfying, and we can speculate that when teachers’ psychological needs are satisfied in training and work environments, the teachers may be more likely to experience overall job satisfaction.

5.2 Limitations

There were several limitations in the present study, the majority of which stemmed from conducting educational research amidst the COVID-19 pandemic. While schools had fully reopened for in-person instruction at the time of the study, the teachers were still operating under some pandemic-related conditions, such as providing resources to the special online program (for students with health exceptions) and attending to additional duties related to the health/wellness of the students. Combined with coming out of two years of balancing both synchronous and asynchronous instruction, teachers (not just of the present study, but in general) are facing unprecedented stress levels (GBAO, 2022), which made recruitment for the present study challenging. The small sample size of the present study is inevitably a limitation when attempting to make causal claims and limited our ability to have a control group. Future studies can expand upon the present study by comparing the effects of the precise praise PD group to a business-as-usual control group, as well as perhaps to other treatment groups that vary in PD dosage.

Secondly, because we were focusing on very young children (ages 4-6 years) and utilizing a fully remote research design, we were limited in the ways in which we could collect student outcome measures. As such, we opted to collect teacher reports of classroom engagement and student-teacher relationships instead of directly measuring student engagement and relationships, either through observation or student reports. It is possible that the teachers would have felt it necessary to mark socially acceptable responses, thus biasing the results. However, if we are to view teachers as experts in their field and active participants in the research, then perhaps there is space to question

common standards of reliability. For example, Sellbom et al. (2018) argue that self-report measures may be more reliable than observations because they do not require ‘judgement calls’ by external observers, who, in the case of educational research, would be foreign to the day-to-day happenings of the classroom environment. What this study does reveal, however, is the need for valid and reliable teacher report measures of student engagement that can be taken at the classroom-level (rather than individual student-level), as classroom-level measures decrease the amount of time and work required from teachers. Our adapted CES is the first scale, to our knowledge, developed to measure teacher reports of kindergarten student engagement at the classroom-level. Future research into the validation of this tool would allow teachers to play active roles in the research process in valid, reliable, and time-sensitive ways.

Lastly, and unrelated to challenges faced from the pandemic, caution must be taken when generalizing the results of the present study outside of early education teachers in the U.S. While the participants in our study consisted of a diverse group of teachers (in terms of race, age, experience, etc.) and represented various regions across the southern and southwestern U.S., it is possible that our results would not generalize to other populations of teachers, and that a different PD approach would be needed. In the U.S., there has been a push for more positive approaches to behavior management (Jenkins et al., 2015), and this was evidenced in our teachers’ very high natural rates of positive feedback at baseline. An appreciation for the benefits of precise praise and uptake of its usage was very quick within our sample of teachers (the PD program occurred over only 5-6-weeks), but this perhaps would not be the case in cultures where general praise is not already a common component of the classroom discourse. Uptake of precise praise is likely dependent on multiple factors unique to the teacher that intersect with the teacher’s culture and societal values. For example, in collectivist societies, that are more aligned with a social-constructivist approach to learning (Morrone et al., 2004), it is possible that teachers would need more time to understand the benefits of precise praise, reflect, and experiment with its usage in the classroom. Further, while we found positive correlations between teachers’ precise praise usage and classroom engagement

and student-teacher relationships, it is possible that the same would not be true in other cultures, especially where praise may feel foreign or even uncomfortable to the students. Additionally, given the behavioral needs of young children, our study was situated within an early education context as we hypothesized that precise praise would potentially be most impactful to this age-group. However, some research suggests that praise may not be perceived well as students become older, likely due to the attributional-related information that is attached to praise for older children (Meyer et al., 1979, 1986, 2004). Future studies could help determine if precise praise is an effective teaching strategy outside of the early education/elementary school years context.

5.3 Implications

5.3.1 Applied Implications

Based on previous work in the field, Didion et al. (2020) identified three core features that make PD successful: intensity, relevance, and participation. Following Didion et al.’s framework of effective PD, the present study provides evidence that fully remote PD designs can be effective, and we argue that the success of the precise praise PD program was largely due to its fully remote design.

There has been debate over the optimal number of contact hours, i.e., *intensity*, that is necessary to impart change on a teacher’s practice (Allday et al., 2012; Kennedy, 2016; Yoon et al., 2007). Elek & Page (2019) speculated that discrete skills may require less time to learn, and thus require a lower PD dosage, and the present study substantiates that claim. The precise praise PD program was effective at increasing teachers’ precise praise usage in the classroom, while being sensitive to the time commitment required from teachers (approximately 6-10 hours over 5-6 weeks). One participant commented, “This was fantastic. I really appreciated that it did not take a lot of time to record videos and get feedback.” We believe that the fully remote design of our PD enabled it to be both low intensity and effective, as it allowed teachers to complete many components in their own time.

Secondly, as previously discussed, the ‘in situ’ video observations and flexibility of the coaching pathways allowed our PD program to directly respond to what was happening in individual classrooms, increasing the coaching *relevance* toward teachers’ own practices (Downer et al., 2011; McCollum et al., 2013). A teacher participant remarked, “I really enjoyed getting feedback based on my actual lessons that you watched.” The coach was able to conduct up to five observations per teacher in less than two months because there was not the need to travel to various school sites to conduct in-person observations. As such, the coach was able to become more quickly acquainted with each teacher’s needs and provide relevant feedback during the coaching sessions.

Lastly, PD is effective when it includes the active *participation* of the teacher participants, especially when their growth is promoted through self-reflection (Elek & Page, 2019; Kennedy, 2016; Yang et al., 2022). Self-reflection of knowledge, beliefs, and teaching practices is an important part of professional growth that is captured in many of the change models of teacher growth (Clarke & Hollingsworth, 2002; Desimone, 2009). Given our remote design, classroom observations took the form of video recordings; this created unbiased records of teachers’ practices that could be used during the one-on-one coaching sessions to aid teachers’ reflective processes. On utilizing classroom video footage, a teacher stated, “Being able to see…my current practices helped me see and understand how/what changes I needed to make.” In sum, the present study provides evidence that remote PD can be effective at evoking change in teachers’ practices when measured against the framework of effective PD, as outlined by Didion et al. (2020).

5.3.2 Theoretical Implications

Another major contribution of the present study is that it adds to our current understanding of how teachers experience professional growth, and is the first, to our knowledge, to consider teachers’ own psychological need satisfaction in the design of the PD program. Above we argued that the success of the precise praise PD program was largely due to its fully remote design, and we assert that another component of the success was that the PD program accounted for teachers’ psychological need satisfaction

in its design. Various change models have attempted to visualize the process of teacher professional growth. While the order in which the components of growth occur varies in the different models, all models encompass the following: (1) a source of learning/information, i.e., the PD program; (2) teacher-level outcomes, such as changes in beliefs, attitudes, practice, etc.; and (3) student-level outcomes (Clarke & Hollingsworth, 2002; Desimone, 2009; Guskey, 1986; Yang et al., 2022). We advance that future change models of teacher professional growth should contain an additional component, *teachers' psychological need satisfaction*, and that this component should come prior to the component of learning/information. In other words, we argue that teachers' psychological need satisfaction should be accounted for within the design of any PD program. Doing so values teachers as professionals who are agents of their own change and may increase the effectiveness of PD and training programs.

5.4 Suggestions for Future Research

Future research is needed to address the limitations of the present study, such as increasing the sample size of teachers, utilizing a control group to improve the rigor of the design, expanding the PD program to other cultural and grade-level contexts, and collecting longitudinal data of student outcomes at a delayed follow-up to confirm a linkage between teachers' precise praise usage and students' psychological need satisfaction. Increasing the sample size of teachers would inevitably require additional instructional coaches, and so an interesting future direction would be to develop a new component of the PD program that is for ‘training the trainers,’ and to track coach/trainer success throughout the duration of the study. It would be useful to understand if differences in teacher success in the program are linked to the instructional coach that they worked with. Quantitative knowledge of what makes an instructional coach successful (or unsuccessful) could move the field of teacher PD forward in meaningful ways, and as Yang et al. (2022) argue, taking remote early education coaching programs to scale is an important next step within the field.

5.5 Conclusions

The present study aimed to increase kindergarten teachers’ utilization of precise praise in the classroom following a short, fully remote PD program grounded in SDT. In doing so, we collected information on teachers’ natural utilization of different feedback statements and measured their change in practice over time. In line with current literature, the teacher participants of the present study had a high rate of general positive feedback at baseline, but rarely incorporated precise praise into their regular practice before the PD program. However, the results of the present study indicated that the precise praise PD program was successful at increasing teachers’ precise praise usage over the 5–6-week intervention period, and this change was statistically significant even after controlling for teachers’ own expectations for change. We also explored whether a teachers’ increased precise praise usage could predict their students’ psychological needs satisfaction of competence, autonomy, and relatedness. Future research will be needed to confirm whether precise praise is a statistically significant predictor of students’ psychological need satisfaction. Such evidence could advance precise praise as an easy-to-use, learnable, and impactful teaching strategy.

In sum, the development of the precise praise PD program represents a significant effort to create an effective, fully remote coaching program that is psychologically need satisfying in its design. From the start of the study, we adopted a pragmatic philosophy to research design and methodology. We firmly believed that teachers should be provided with opportunities for professional growth that are sensitive to the demands of their time, and practical within the constraints of a teaching schedule. As educational researchers, we have the power to decide how we position ourselves in relation to the teacher participants that we work with. In an SDT framework, we choose to view teachers as competent professionals, autonomous agents of their own change, and ultimately, people deserving of connection and relatedness to those who hope to learn from them.

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Appendix A: Teacher Information Sheet

Teachers and Precise Praise

Ethics Approval Reference: CIA-22HT-024

Dear Teacher,

I am writing to enquire about conducting some research with you this academic year. I am a master's research student at the University of Oxford, supervised by [redacted]. In my research study, *Self-determination in the kindergarten classroom: understanding the role of the teacher's utilization of 'precise praise,'* I will explore teachers' change in their usage of 'precise praise' in the classroom following coaching, and the relationship that this change has to children's achievement and engagement, and classroom climate.

The research will take place in kindergarten classrooms in April 2022. I am not aiming to change what or how you choose to teach, and I will not be making any judgements about your teaching. My research focus is on teachers' utilization of precise praise.

By participating in the research, you would be contributing to research that will expand our understanding of teacher professional development and teacher praise.

I will ask you to video record yourself for 5-20 minutes during 4-7 of the Language & Literacy blocks of your class and to participate in 2-3 virtual coaching sessions hosted over Microsoft Teams. The video camera will focus on you throughout and any incidental images of students will not be seen by anyone else or used for research. The video recordings (uploaded securely via Microsoft Forms) will be used in the coaching sessions, as well as to understand the impact of the professional development program. You will also be asked to fill out general questionnaires on teacher/classroom characteristics, the level of your class engagement, and the climate in your classroom. We will collect existing classroom achievement data from two FastBridge testing sessions. Throughout the video and coaching phase of the study you may withdraw at any point by emailing me. Withdrawal will not be possible once the data has been collected and anonymized.

What happens to the data provided?

During the study, video recordings of the teacher will be made. Recordings will be securely stored in a password protected, encrypted file and will only ever be shown to other members of the research team.

All participants, including students, teachers and the school, would be made anonymous in all research reports. The data collected would be kept strictly confidential, available only to my supervisor and myself and not used other than specified without the further consent of all involved being obtained. All recordings would be destroyed at the end of the research period, and kept in locked conditions until then. I have enclosed copies of the information for parents/guardians with this letter.

I will send a brief report on the research to you at the end of the study, and you are welcome to see this. I will not identify the school, teacher, or any students in any reports of the research.

Will the research be published?

The research may be published in academic journals. The University of Oxford is committed to the dissemination of its research for the benefit of society and the economy and, in support of this commitment, has established an online archive of research materials. This archive includes digital copies of student theses successfully submitted as part of a University of Oxford postgraduate degree programme. Holding the archive online gives easy access for researchers to the full text of freely available theses, thereby increasing the likely impact and use of that research.

The research will be written up as a student's thesis. On successful submission of the thesis, it may be deposited both in print and online in the University archives to facilitate its use in future research. If so, the thesis will be openly accessible.

Who is conducting this research?

The research is organised by [redacted] of the University of Oxford, who is a MSc Education (Child Development and Education) student. [redacted].

Ethics

This study has been reviewed by, and received ethics clearance through, the University of Oxford's Central University Research Ethics Committee, CIA-22HT-024. Any research with students will be conducted with care and sensitivity.

Oxford University has strict ethical procedures on conducting ethical research with teachers and students, consistent with current British Educational Research Association guidelines. Before beginning the research, I would inform parents/guardians about the research and offer parents/guardians the opportunity to refuse to participate. Throughout the research, students and parents/guardians will be able to refuse to participate at any time. If a family chooses to opt-out from the study, we will work together to make sure the child is placed in area of the room where they will not incidentally enter the video frame.

What if there is a problem?

If you have a concern about any aspect of this study, please contact [redacted] and we will do our best to answer your query. I/we will acknowledge your concern within 10 working days and give you an indication of how it will be dealt with. If you remain unhappy or wish to make a formal complaint, please contact the Chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter as soon as possible:

Chair, **Social Sciences & Humanities Inter-Divisional Research Ethics Committee**; Email: ethics@socsci.ox.ac.uk; Address: Research Services, University of Oxford, Wellington Square, Oxford OX1 2JD

Data Protection

The University of Oxford is the data controller with respect to any personal data collected, and as such will determine how this personal data is used in the study. The University will only process personal data for the purpose of the research outlined above. Research is a task that is performed in the public interest. Further information about your rights with respect to personal data is available from: http://www.admin.ox.ac.uk/councilsec/compliance/gdpr/individualrights/.

If you would like to take part in the study, please click the link in the email for the consent form. If you need more information about what is involved, please do not hesitate to contact me.

Thank you for your time and attention. I look forward to hearing from you.

Yours Sincerely,

[redacted]

Appendix B: Teacher Informed Consent Form

(n.b. Form was provided in a digitized format.)

CONSENT FORM FOR TEACHERS

Central University Research Ethics Committee (CUREC) Approval Reference: CIA-22HT-024

Self-determination in the kindergarten classroom: understanding the role of the teacher's utilization of 'precise praise'

		Please initial e box
1	I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
2	I understand that my participation is voluntary and that I am free to withdraw at any time (during the video and coaching phase of the study), without giving any reason, and without any adverse consequences or penalty.	☐
3	I understand that research data collected during the study may be looked at by authorised people outside the research team. I give permission for these individuals to access my data.	☐
4	I understand that this project has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee.	☐
5	I understand who will have access to personal data provided, how the data will be stored and what will happen to the data at the end of the project.	☐
6	I understand how this research may be written up and published.	☐
7	I understand how to raise a concern or make a complaint.	☐
8	I understand that researchers will observe lessons and other aspects of my teaching, as detailed on the information sheet, and discussed and agreed with the researchers.	☐
9	I consent to being audio/video recorded.	☐
10	I understand how audio/video recordings will be used in research outputs.	☐
11	I agree to take part in the study.	☐

Name of Participant	dd / mm / yyyy Date	Signature

Appendix C: Family Information Sheet

Teachers and Precise Praise
INFORMATION SHEET FOR PARENTS / GUARDIANS

Ethics Approval Reference: CIA-22HT-024

In partnership with researchers at the University of Oxford, your student's school has agreed to take part in a research study. We would like to invite your child, along with the rest of their Kindergarten class, to be involved in this study, which is focussed on the lead Kindergarten teacher, not individual students. We very much hope you would like your child to be involved, but before you decide, it is important that you understand why the study is being done.

What are we trying to find out?
The ways that teachers provide feedback to their students are important in helping them succeed in school. We are investigating how teachers provide feedback to their students, specifically praise, and the relationship that praise has to the classroom environment and outcomes. We have chosen to work with your child's teacher, and they have agreed to be a part of this professional development study. The research will help to improve the role of teacher praise with similar groups of students.

Why has my child been invited to be involved in this research?
We are inviting your child because they are in the kindergarten class of a participating teacher. All pupils in their class are invited to be involved in this research.

What will my child be asked to do?
Your child's teacher will plan and run lessons according to the standard school curriculum, meaning students will be following their usual kindergarten lessons. In April 2022, your child's teacher will participate in a professional development program and some of their lessons will be video recorded. The video camera will only record the actions of the teachers. If your child is accidentally filmed or named, the images/names will be cut from the recording and will never be used for research or be seen by anyone other than members of the research team. The students will not have to do anything that they would not normally do in their lessons.

Does my child have to be involved?
No. You can ask questions about the study before deciding whether to allow your child to be involved. If you do agree to their involvement, you may withdraw your child at any time, without giving a reason and without any effect on their education, by advising the teacher or researchers of this decision. If your child is not involved in the research, they will be placed where they cannot be incidentally observed or recorded.

What are the advantages / disadvantages of taking part?
Professional development and growth are important for all teachers, and your child may benefit from their teacher's participation in the program. There are no risks to participation.

What happens to the data provided?
During the study, video and voice recordings of the teacher will be made. There is a possibility that your child's image and/or voice may be incidentally recorded as part of this. Recordings will be securely stored in a password protected, encrypted file and will only ever be shown to other members of the research team. Opt-out forms will be retained by the researcher for the duration of the study, and for as long as the school determines appropriate after research activities have concluded at the school.

We will ensure all other data collected in the study is de-identified as soon as possible after collection. Audio and/or video recordings, notes, and all other data will be stored in a locked cabinet in a locked office in the University of Oxford and/or on password protected digital files. At the end of the study, recordings will be erased. The researcher and supervisor will have access to the research data. Responsible members of the University of Oxford may be given access to data for monitoring and/or audit of the research.

We will send a brief report on the research to your child's school at the end of the study, and you are welcome to see this. We will not identify the school, teacher, or any students in any reports of the research.

Will the research be published?
The research may be published in academic journals. The University of Oxford is committed to the dissemination of its research for the benefit of society and the economy and, in support of this commitment, has established an online archive of research materials. This archive includes digital copies of student theses successfully submitted as part of a University of Oxford postgraduate degree programme. Holding the archive online gives easy access for researchers to the full text of freely available theses, thereby increasing the likely impact and use of that research. The research will be written up as a student's thesis. On successful submission of the thesis, it may be deposited both in print and online in the University archives to facilitate its use in future research. If so, the thesis will be openly accessible.

Who is conducting this research?
The research is organised by [redacted] of the University of Oxford, who is a MSc Education (Child Development and Education) student. [redacted]

Ethics
This study has been reviewed by, and received ethics clearance through, the University of Oxford's Central University Research Ethics Committee, CIA-22HT-024. Any research with students is conducted with care and sensitivity.

What if there is a problem?
If you have a concern about any aspect of this study, please contact [redacted] and we will do our best to answer your query. I/we will acknowledge your concern within 10 working days and give you an indication of how it will be dealt with. If you remain unhappy or wish to make a formal complaint, please contact the Chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter as soon as possible:

Chair, **Social Sciences & Humanities Inter-Divisional Research Ethics Committee**; Email: ethics@socsci.ox.ac.uk; Research Services, University of Oxford, Wellington Square, Oxford OX1 2JD

Data Protection
The University of Oxford is the data controller with respect to any personal data collected, and as such will determine how this personal data is used in the study. The University will only process personal data for the purpose of the research outlined above. Research is a task that is performed in the public interest. Further information about your rights with respect to personal data is available from: http://www.admin.ox.ac.uk/councilsec/compliance/gdpr/individualrights/.

What should I do next?
If you would **NOT** like your child to take part in this study, please CLICK HERE. Please remember that you may withdraw your child at any time, without affecting their education and without giving a reason, by notifying the researcher.

If you would like to discuss the research with someone beforehand (or if you have questions afterwards), please contact:

[redacted]
Department of Education
University of Oxford
15 Norham Gardens
Oxford, OX2 6PY
[redacted]

Appendix D: Student Opt-Out Form

(n.b. Form was provided in a digitized format.)

Teachers and Precise Praise

OPT-OUT FORM

Ethics Approval Reference: CIA-22HT-024

If you **DO NOT** want your child to be included in the above-named research study, please fill out the form below by [dd/mm/yyyy].

If we do not receive an opt-out form from you by this date, your child may be included in this study, as described in the accompanying information sheet.

I, the undersigned, hereby DO NOT give permission for my child to be included in the study titled Self-determination in the kindergarten classroom: understanding the role of the teacher's utilization of 'precise praise'

Name of child: _____

Name of parent/guardian: _____

Signature: _____ Date: _____

Name of researcher: [redacted]

Appendix E: Video Coding Scheme

Video Coding Scheme

Code	Options	Description
Feedback	• PP (0) • PF-V (1) • PF-NV (2) • NF-V (3) • NF-NV (4) *Note.* PP=Precise Praise; PF=Positive Feedback; NF=Negative Feedback (V/NV indicates verbal vs. nonverbal) *Note.* If a teacher gives verbal feedback *with* a thumbs up or a clap, it should be coded as verbal. Nonverbal feedback is solely nonverbal, with no accompanying speech.	**Whether the feedback was precise praise or positive/negative feedback.** • *Precise Praise* is defined as a specific praise statement that communicates information (i.e., Katie used fingerspelling to help her sound out the word. Great job, Katie! Thank you, Max, for being a respectful student by listening to your peers and waiting your turn to speak). ○ *Note.* Some teachers use pre-defined, short phrases that communicate information (e.g., STAR, SHINE), and these should be coded as Precise Praise (i.e., Jack is sitting on the carpet like a STAR student!). • *Positive feedback* is defined as non-specific praise statements or statements of approval, both verbal (i.e., Great job! So smart! Really great answer!) and nonverbal (i.e., a thumbs up with a smile). ○ *Note.* Statements of acknowledgement (i.e., Thank you for being patient) are coded as positive feedback unless additional information is included to make it Precise Praise (i.e., Thank you for being patient by waiting for your turn and not shouting out the answer). • *Negative feedback* is defined as any statement of disapproval in response to a behavior or action, both verbal (i.e., I told you to stop doing that) and nonverbal (i.e., snapping at a student off-task). ○ *Note.* Clarifications or reminders of instructions are not coded (i.e., No, that's not the right answer; Remember, I said that when you're done you should put your paper here; Sit down here, please).
Antecedent	• Autonomous (0) • Controlled (1) • Undetermined (2)	**How the feedback was used to motivate the student based on the context in which the feedback was given.** • *Autonomous statements* are not linked to a reward or threat (i.e., I'm looking for a SHINE student. Mia, you are a SHINE student sitting with a calm body on the carpet. Great job!). Autonomous statements are used to motivate students by genuinely commenting on their exhibited behavior. • *Controlled statements* are linked to a reward or threat (i.e., I'm looking for a SHINE student who will get a scholar dollar. Mia, you get a dollar!).

		○ *Note*. Examples of control items include: taking away/offering extra recess, taking away/adding 'points,' offering rewards (e.g., tickets, dollars, prizes, etc.), asking the child to 'clip up/clip down' on the clip chart, etc. ▪ *Note*. 'Points' in the example above refers to points on a behavior chart, for example. If a game is being played that includes the tallying of points, that would not be considered a controlled statement.
Type	• Academic (0) • Social-emotional (1) • Mixed (2)	**Whether the feedback referred to an academic versus a social-emotional behavior.** • *Academic behaviors* are actions or strategies used to respond to questions or to attempt academic tasks (i.e., using context clues, blending sounds, fingerspelling, using a complete sentence, using a key term). Academic behaviors that receive negative feedback are behaviors that hinder learning (i.e., copying the answer from a friend). • *Social-emotional behaviors* are actions that promote a positive classroom environment (i.e., following instructions, sharing materials, persevering). Social-emotional behaviors that receive negative feedback are behaviors that undermine a positive classroom environment (i.e., talking over a peer, kicking legs on the carpet, shouting out an answer instead of raising hand).
Setting	• Individual (0) • Group (1) • Mixed (2)	**Whether the feedback was delivered to an individual student or to a group of students.** • *Note*. In cases where the feedback starts at the group level, but then is narrowed to specific students, the 'mixed' code is used (i.e., I see lots of students using neat handwriting. Thank you, Mia. Thank you, John.)
Notes	Qualitative	Direct quote of the feedback that was given or other situational notes that would be relevant.

Note. Use the accompanying 'Video Coding Tracker' sheet to code videos. Select an empty tab in the sheet and rename the tab by the video's ID number (all video ID numbers follow the format XXX-X). Use the drop-down menus in the cells to select the appropriate codes. Refer to this guide for examples.

Appendix E: Video Coding Scheme (continued)

(n.b. Summary of changes to the video coding scheme following the video coding pilot)

Video Code	**Summary of Changes**
Category	We noticed that feedback was given to students both verbally and nonverbally. Nonverbal feedback took both positive forms (e.g., a smile with a thumbs-up) and negative forms (e.g., snapping at a student displaying undesired behavior). As such, we opted to develop separate codes to acknowledge these distinctions (e.g., PF-V for 'positive feedback-verbal' and PF-NV for 'positive feedback-nonverbal'). As precise praise relies on the communication of specific information to students, nonverbal precise praise was not considered possible, so only one code (PP) was used for precise praise statements.
Antecedent	Games involving points were used as instructional activities in the videos. A clarification was made to the coding scheme to distinguish between points in a game (not controlled) and points for good/bad behavior (controlled). A third option for 'undetermined' was also added.
Type	There were times when a teacher would combine feedback types into one statement (e.g., "Kennedy is sounding out the words on her paper and she is patiently waiting her turn to share by not shouting out. Nice job, Kennedy!"). A 'mixed' category was added for these instances.
Setting	There were cases where feedback started at the group level, but then narrowed to specific students (e.g., "I see lots of students focusing on forming their letters properly and using neat handwriting. Great job, Aaron! Great job, Haley!"). A 'mixed' category was added for these situations.
Topic	Topic refers to lesson topic (i.e., phonics, reading, writing, grammar, other). Because teachers were asked to end the recording at the end of an instructional activity, there were not instances where the lesson topic changed throughout a recording, so this code was removed, and each video was labeled by the lesson topic instead.

Appendix F: *Classroom Engagement Scale* (CES; Barghaus et al., 2021)

(n.b. Adapted version for this study is shown below. Participants were provided with a digitized version.)

STUDENT ENGAGEMENT IN THE CLASSROOM

Please reflect on how much each of the statements below currently applies to the children in your classroom. All children are individual, but in responding, please think about the children in your classroom in general during the past month. Use the scale below to choose the appropriate response for each item.

Definitely does not apply 1	Not really 2	Neutral, not sure 3	Applies somewhat 4	Definitely applies 5

The children in my classroom…						
1.	Respect the school environment and materials.	1	2	3	4	5
2.	Show positive attitudes toward learning.	1	2	3	4	5
3.	Work and play cooperatively with each other.	1	2	3	4	5
4.	Handle conflict appropriately.	1	2	3	4	5
5.	Make appropriate movements between activities.	1	2	3	4	5
6.	Listen and follow directions.	1	2	3	4	5
7.	Respect the rights, diversity, feelings, and property of others.	1	2	3	4	5
8.	Can work independently.	1	2	3	4	5
9.	Complete work on time.	1	2	3	4	5
10.	Strive for quality work.	1	2	3	4	5
11.	Demonstrate consistent effort.	1	2	3	4	5
12.	Accept responsibility for choices and actions.	1	2	3	4	5
13.	Organize themselves, materials, and belongings.	1	2	3	4	5
14.	Participate in group activities.	1	2	3	4	5

Adapted from the Classroom Engagement Scale (Barghaus et al., 2021).

Appendix G: *Student Teacher Relationship Scale-Short Form* (STRS-SF; Pianta, 2001)

(n.b. Adapted version for this study is shown below. Participants were provided with a digitized version.)

YOUR RELATIONSHIPS WITH CHILDREN IN THE CLASSROOM

Please reflect on how much each of the statements below currently applies to your relationship with the children in your classroom. All relationships are individual, but in responding, please think about your relationships with the children in your classroom in general during the past month. Use the scale below to choose the appropriate response for each item.

Definitely does not apply 1	Not really 2	Neutral, not sure 3	Applies somewhat 4	Definitely applies 5

1.	I share an affectionate, warm relationship with the children.	1	2	3	4	5
2.	The children and I always seem to be struggling with each other.	1	2	3	4	5
3.	If upset, the children will seek comfort from me.	1	2	3	4	5
4.	The children are uncomfortable with physical affection or touch from me.	1	2	3	4	5
5.	The children value their relationship with me.	1	2	3	4	5
6.	When I praise the children, they beam with pride.	1	2	3	4	5
7.	The children share information with me about themselves even if I don't ask.	1	2	3	4	5
8.	The children easily become angry with me.	1	2	3	4	5
9.	It is easy to be in tune with what the children are feeling.	1	2	3	4	5
10.	The children remain angry or are resistant after being disciplined.	1	2	3	4	5
11.	Dealing with the children drains my energy.	1	2	3	4	5
12.	When the children are in a bad mood, I know we're in for a long and difficult day.	1	2	3	4	5
13.	This children's feelings toward me can be unpredictable or can change suddenly.	1	2	3	4	5
14.	The children are sneaky or manipulative with me.	1	2	3	4	5
15.	The children openly share their feelings and experiences with me.	1	2	3	4	5

Adapted from The Student-Teacher Relationship Scale – Short Form (Pianta,1992) by Whitaker, R.C., Dearth-Wesley, T., & Gooze, R. A. (2015).

Appendix H: *Basic Psychological Need Satisfaction and Frustration Scale* (BPNSFS; Van der Kaap-Deeder, 2020)

(n.b. Adapted version for this study is shown below. Participants were provided with a digitized version.)

BASIC PSYCHOLOGICAL NEED SATISFACTION AND FRUSTRATION SCALE

The next statements tap into your experiences during the Precise Praise professional development program. Please indicate for each of the statements to what extent they are true for you.

1 Not at all true	2 Not really true	3 Sometimes true/ sometimes not true	4 Somewhat true	5 Very true

1. I felt a sense of choice and freedom in the things I thought and did.
2. I felt forced to do things I would not choose to do.
3. I had doubts about whether I could apply the proposed strategies.
4. I felt close and connected to the facilitator.
5. I felt like the suggestions given reflected what I wanted for myself.
6. I felt insecure about my abilities to put the proposed strategies into practice.
7. I had the impression that the facilitator had less respect for my opinion.
8. I felt confident that I could apply the proposed strategies well.
9. I felt connected with the facilitator.
10. I felt competent to achieve the proposed goals.
11. I felt that the relationships with the facilitator were just superficial.
12. I felt capable at applying the proposed strategies into practice.
13. I felt pressured to think and act in a certain way.
14. I felt disappointed with how I handled the exercises and tasks.
15. I experienced a good bond with the facilitator.
16. Most exercises and tasks I did felt like 'I had to'.
17. I felt that facilitator was rather cold and distant towards me.
18. I felt like the content of the program really interested me.

Adapted from Van der Kaap-Deeder, J., Soenens, B., Ryan, R. M., & Vansteenkiste, M. (2020). Manual of the Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS). Ghent University.

Appendix I: Sample Teacher PD Certificate

Appendix J: CUREC Approval

Dear [redacted]

Title: Self-determination in the kindergarten classroom: understanding the role of the teacher's utilization of 'precise praise'

Ref: CIA-22HT-024

The above application has been considered on behalf of the Departmental Research Ethics Committee (DREC) in accordance with the procedures laid down by the University for ethical approval of all research involving human participants.

I am pleased to inform you that, on the basis of the information provided to the DREC, the proposed research has been judged as meeting appropriate ethics standards, and accordingly, approval has been granted.

Please continue to follow all current guidance issued by CUREC during the pandemic, notably COVID-19: CUREC guidance on research involving human participants, https://researchsupport.admin.ox.ac.uk/governance/ethics/coronavirus

If relevant please also check the CUREC website for their best practice research guides, these can be very useful in refining the writing up of ethical considerations in your research – see https://researchsupport.admin.ox.ac.uk/governance/ethics/resources/bpg

Good luck with your research study,

Best wishes

Hamish Chalmers
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