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Playfulness as the antecedent of kindergarten children's prosocial skills and school readiness

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ABSTRACT

This study examined the interrelationships among playfulness, prosocial skills, and school readiness of Hong Kong kindergarten children across time. Participants were 106 local children (55.6% boys, mean age = 60.0 months) and their parents and teachers. At time 1, parents reported their child's age, gender, and playfulness. Six months later at time 2, teachers reported children's prosocial skills and school readiness. The structural equation model revealed that children's playfulness at time 1 significantly predicted their prosocial skills at time 2, and that their prosocial skills and school readiness at time 2 were positively associated. The indirect relationship between playfulness and school readiness as mediated through prosocial skills was significant, whereas the direct relationship was non-significant. These findings suggest that children's playfulness may contribute to school readiness by fostering prosocial skills. Practically, results highlight the utility of promoting children's playfulness and prosocial skills to support their formal school transition.

KEYWORDS

Playfulness; prosocial skills; school readiness; kindergarten children

Introduction

Playfulness of kindergarten children reflects their likeliness to engage in playful situations (Barnett 1991), and this characteristic may influence their participation in school peer play (Rentzou 2014) and development in prosocial skills (Newton and Jenvey 2011). Accumulating research has examined the relationship between playfulness and social development of kindergarten children (e.g. Barnett 2018; Fink, Mareva, and Gibson 2020; Fung and Chung 2022a), but the findings are inconclusive. Emerging evidence has also suggested that prosocial skills can support kindergarten children's formal school transition (e.g. Blair and Raver 2015; Campbell et al. 2016). However, limited research has investigated the relationships among playfulness, prosocial skills, and school readiness of kindergarten children, and even less has examined the associations with longitudinal data.

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Classic developmental theories (e.g. Piaget 1976; Vygotsky 1967) suggested that, through play, children can explore the context and acquire different knowledge and skills. In particular, school peer play provides children with a natural context to practise and develop their prosocial skills (Beaty 2014; Bodrova and Leong 2018). The Hong Kong Kindergarten Education Curriculum Guide (Curriculum Development Council 2017) highlights the importance of shaping children's social skills (p.89) to promote their readiness for formal school transition while these skills can be acquired and practiced through various daily activities such as peer play (p.64). Therefore, play has been widely accepted and commonly used as an effective way to foster children's holistic development and learning in Hong Kong kindergarten settings (Bautista et al. 2021; Lau and Li 2018). Nevertheless, early-year practitioners and teachers in Hong Kong are still ambivalent about implementing play in the daily curriculum and schedule, with concerns about feasibility, time and space constraints, and parental academic expectation (Bautista et al. 2021). Many Hong Kong parents hold positive attitudes toward play. Still, they have yet to be convinced that play is important to children's preparedness to enter formal schooling (Bautista et al. 2021). One of the primary reasons is a lack of empirical evidence demonstrating how play may benefit children's development such as prosocial skills and school readiness (Bautista et al. 2021; Fung and Cheng 2012). Considering that playfulness is a trait-like characteristic that governs children's play behaviors across contexts (Barnett 1991), the present study aimed to fill these gaps by examining the direct and indirect relationships of playfulness with prospective prosocial skills and school readiness in a sample of Hong Kong Chinese kindergarten children.

Playfulness and prosocial skills

Playfulness is a construct in child developmental research interlinked with play (Rentzou 2014). Playfulness indicates children's inclination to participate in playful situations and encounters beyond settings and materials (Barnett 1991). Kindergarten children's playfulness could be reflected by five indicators including physical spontaneity (motor coordination, dexterity, and propensity), social spontaneity (approaches of and tendency to social interaction), cognitive spontaneity (imaginativeness and inventiveness), manifest joy (expressiveness of emotions), and sense of humor (generation and appreciation of humorous atmosphere) (Barnett 1991). More playful children tend to exhibit higher capabilities to lead and enter group play, contribute interesting and imaginative play ideas, and create positive emotional exchanges among peers (Barnett 2018). Therefore, these children are more likely to take part in and benefit from school peer play (Fung and Chung 2022a). To engage successfully in peer play interactions in school, children are likely to show a variety of prosocial behaviors, including sharing play materials and taking turns, understanding others' perspectives and feelings, and offering help to those children in need (Fung and Cheng 2017; Fung and Chung 2022a). Helping children develop prosocial behaviors is essential for social competencies (Beaty 2014).

Previous research suggests that more playful children may engage in higher levels of peer play (e.g. Fink, Mareva, and Gibson 2020). Those children who engage in more peer play tend to exhibit better social development (e.g. Fung and Cheng 2017; Newton and

Jenvey 2011). However, the relationship between playfulness and social development remains unclear. For example, Fung and Chung (2022) reported that more playful children displayed lower peer problems. On the contrary, Fink and colleagues (2020) concluded that kindergarten children's playfulness was unrelated to teacher-reported social maturity and peer-rated social preference but that more playful children were likely to show lower levels of externalizing behaviors. Similarly, Barnett (2018) reported that kindergarten children's playfulness was unrelated to their prospective teacher-rated social competence at grade one. Therefore, the relationship between playfulness and social development among kindergarten children warrants further examination. The present study investigated how children's playfulness would be associated with their prosocial skills across time.

School readiness in relation to prosocial skills and playfulness

School readiness indicates a child's capacity to have a successful formal school transition (Fung et al. 2020). As a multidimensional concept, school readiness includes a wide range of academic skills such as language, literacy, and mathematics, and a variety of cognitive skills including focused attention, inhibitory control, and problem-solving (e.g. Duncan et al. 2007; Eisenberg, Valiente, and Eggum 2010; Portilla et al. 2014). The psychobiological framework of school readiness (Blair and Raver 2015) contended that children's higher-order cognitive skills are central to their school readiness. Consistently, first-grade teachers regarded cognitive skills of behavioral regulation and problem-solving as better indicators of children's school readiness than their academic skills (Gumpel 1999). In the present study, children's school readiness was viewed as their academic skills and cognitive capacities for problem-solving and behavior regulation, as reported by teachers.

Children's prosocial skills were proposed as the important predictors of their school readiness (Campbell et al. 2016). For example, children with superior prosocial skills can develop positive relationships with peers that help them to navigate through and engage in various teaching and learning activities (Galindo and Fuller 2010). Alternatively, advanced prosocial skills may enable these children to relate better with class teachers, motivating their acquisition and internalization of concepts and knowledge (Hernández et al. 2016). Increasing evidence has supported the predictive role of prosocial skills in school readiness (e.g. Denham and Brown 2010; Stacks and Oshio 2009; Ziv 2013). Nonetheless, little attempt has been made to investigate if more playful children would develop better prosocial skills, which may, in turn, support their school readiness. The present study has expanded the literature by examining the indirect relationship between children's playfulness and their subsequent prosocial skills and school readiness.

Contrary to the plenteous literature investigating the relationship between prosocial skills and school readiness, limited research has examined the direct relationship between playfulness and school readiness of kindergarten children. Proyer (2011) reported positive correlations between adults' playfulness and academic achievement and further suggested that playfulness may be a coping strategy that facilitated their academic performance. Although Saunders and colleagues (1999) also reported a positive relationship between playfulness and coping skills among kindergarten

children, the extent to which playfulness may directly promote children's school readiness remains an open question. Thus, the present study also examined the direct relationship between playfulness and school readiness of kindergarten children across time.

The present study

This study investigated the direct relationship between playfulness and school readiness and the indirect relationship as mediated through prosocial skills in a sample of Hong Kong Chinese kindergarten children. Based on the literature reviewed (e.g. Barnett 2018; Fink, Mareva, and Gibson 2020; Stacks and Oshio 2009; Ziv 2013), we propose a theoretical framework that more playful children may develop better prosocial skills. Perhaps children are more likely to engage in and benefit from their peer play activities. Further, children's advanced prosocial skills would contribute to their school readiness. Specifically, we expected the indirect relationship between playfulness at time 1 and school readiness at time 2 via prosocial skills would be positive and significant. Given the prior evidence suggesting a possible direct relationship (e.g. Proyer 2011; Saunders, Sayer, and Goodale 1999), we also anticipated that the relationship between playfulness at time 1 and school readiness at time 2 would be positive and significant.

Method

Participants

Participants were 106 Hong Kong children (55.6% boys, mean age = 60.0 months) and their parents and teachers from a local kindergarten located in the low-middle SES neighborhood. This local kindergarten was a partner school in a previous research project, and an invitation was made directly to the school principal. Most children in Hong Kong attend kindergarten for three years: K1 (3–4 years), K2 (4–5 years), and K3 (5–6 years). At time 1, 49 children were at K2, whereas 57 were at K3. 77.8% of the participating parental ages were between 31 and 40, 17.6% were between 41 and 50, and the remaining 4.6% were between 21 and 30. For parental education, 66.7% of them completed college or above, whereas 33.3% completed secondary school. Seventeen teachers participated in this study. Among the teachers, over 90% had a bachelor's degree in early childhood education, while the remaining possessed a diploma in early childhood education. Regarding teaching experience, 58% of the teachers had practised for more than four years.

Procedure

Ethical approval was given by the respective university. The principal of the participating kindergarten also provided written consent. Informed consent and questionnaire forms were subsequently sent to the parents of all K2 and K3 children via the kindergarten to invite their participation. Participating parents returned the completed consent form and questionnaire; the reporting consent rate was 59.2%. Class teachers of the children with positive parental consent were then invited to take part in this study, and all invited

teachers (17 in total) agreed to participate. At time 1 (start of the school year), parents reported their child's age, gender, and playfulness by completing a questionnaire that could be finished in 20 min. At time 2 (six months later), teachers reported their student's prosocial skills and school readiness through a questionnaire, which could be completed in 10 min. Completed questionnaires were locked in a separate research office which was only accessible to research personnel. Participants were represented by a code, and the list linking the participant's identity and the corresponding code was stored separately. Data from the completed questionnaires were stored in a password-protected computer accessible by the first author only. The parents and teachers received a supermarket coupon as a token of compensation for their time participation.

Measures

Playfulness at time 1

Children's playfulness was assessed by parents' ratings on the Children's Playfulness Scale (CPS; Barnett 1991). The CPS consisted of 23 items under five subscales: physical spontaneity, social spontaneity, cognitive spontaneity, manifest joy, and sense of humor. This measure of playfulness was commonly employed in local (e.g. Fung and Chung 2021) and international (e.g. Barnett 2018; Rentzou 2014) research on kindergarten children, with acceptable construct validity and reliability (e.g. Fung and Chung 2022a; Keleş and Yurt 2017). The physical spontaneity (e.g. 'The child runs (skips, hops, jumps) a lot in play,' 'The child prefers to be active rather than quiet in play') and the cognitive spontaneity (e.g. 'The child invents own games to play,' 'The child assumes different character roles in play') subscales had four items, whereas the social spontaneity (e.g. 'The child plays cooperatively with other children,' 'The child assumes a leadership role when playing with others'), manifest joy (e.g. 'The child demonstrates exuberance during play,' 'The child shows enthusiasm during play'), and the sense of humor (e.g. 'The child gently teases others while at play,' 'The child enjoys joking with other children') subscales had five items. Parents rated the items on a 5-point scale: 1 (not at all like) to 5 (very much like), and reverse coding was applied such that a higher score reflects more playful in the concerning aspect. Children's playfulness was represented as a latent variable including the average scores of the five subscales. Cronbach's alphas of the physical spontaneity, social spontaneity, cognitive spontaneity, manifest joy, and sense of humor subscales were .70, .78, .71, .70, and .73, respectively.

Prosocial skills at time 2

Children's prosocial skills were assessed by the prosocial subscale of the Strengths and Difficulties Questionnaire (SDQ; Goodman 1997). The SDQ was employed in prior local research (Fung and Chung 2022a; Li, Lam, and Chung 2020) with fair reliability and validity (e.g. Du, Kou, and Coghill 2008; Lai et al. 2010). The prosocial subscale contained five items understanding children's awareness of others' perspectives ('Considerate of other people's feelings'), helping behaviors ('Often volunteers to help others (teachers, other children)'), and willingness to share ('Shares readily with other children (treats, toys, pencils, etc.)'). Teachers rated the items on a 5-point scale to indicate the extent to which the mentioned behavior correctly described the child: 1 (totally disagree) to 5 (totally agree). The average score represented prosocial skills. The Cronbach's alpha was .91.

School readiness at time 2

Children's school readiness was assessed by the Chinese version of Gumpel Readiness Inventory (GRI; Gumpel 1999). The Chinese GRI consisted of six items under three subscales: academic skills ('Counts forward and backward,' 'Demonstrates understanding of concepts such as before-after, bigger than-smaller than, more-less'), strategic working skills ('Is able to work independently without help from an adult,' 'Can break down a complex task into its constituent parts'), and role-governed skills ('Raises hand when s/he wants to participate,' 'Pays attention during class'). The Chinese GRI was validated in Hong Kong with demonstrated reliability, validity, and unidimensionality (Ho, Leung, and Lo 2013). GRI consisted of three subscales showing statistically unidimensional, computed as a single score. This score has been used to indicate children's school readiness (Fung and Chung 2022b; Fung et al. 2020). Teachers rated the items on a 5-point scale to indicate the child's frequency of showing the appropriate behavior: 1 (never) to 5 (always). The average score represented school readiness. The Cronbach's alpha was .87.

Data analysis plan

The structural equation model for predicting children's school readiness from playfulness and prosocial skills controlling for child age and gender was estimated with the lavaan package (version 0.6-5) in R (version 3.6.1; R Core Team 2020). A latent construct reflecting children's playfulness was indicated by five scores including physical spontaneity, social spontaneity, cognitive spontaneity, manifest joy, and sense of humor. Intraclass correlations were examined to understand the potential influences of the nested sampling structure (i.e. class teachers' ratings on children's prosocial skills and school readiness) on the outcome variables, and the values ranged between .103 and .131. To address the multilevel nature of the data, the lavaan.survey package (Oberski 2014) was employed to correct the parameter estimates and standard errors. This statistical approach for handling the non-independence due to the nested sampling structure was applied in recent research (e.g. Jackson and Cunningham 2017; Stühmann et al. 2020). Overall model fit of the structural equation model was evaluated by the Chi-square index (χ^2 , non-significant), comparative fit index (CFI $\geq .95$), non-normed fit index (NNFI $\geq .95$), root mean square error of approximation (RMSEA $\leq .06$), and standardized root mean square residual (SRMR $\leq .08$) (Hu and Bentler 1999). The significance of the indirect effect on playfulness, prosocial skills, and school readiness was estimated by using the bias-corrected bootstrapping approach (Hayes 2009).

Results

Preliminary analyses

Table 1 shows the descriptive statistics and bivariate correlations of the study variables. The data were complete with no missing value, and the skewness and kurtosis of all variables fell within the range of plus and minus one. The correlations among the five aspects of playfulness were positive and significant ($r_s = .32$ to $.61$, $p_s < .01$). Nevertheless, the

Table 1. Descriptive statistics, reliabilities, and bivariate correlations of study variables.

Variables	Correlations									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
1. Child gender	-									
2. T1 Child age (months)	.00	-								
3. T1 Physical spontaneity	-.07	.10	-							
4. T1 Social spontaneity	.07	.09	.58***	-						
5. T1 Cognitive spontaneity	.08	.10	.32**	.55***	-					
6. T1 Manifest joy	.03	.06	.53***	.61***	.52***	-				
7. T1 Sense of humor	-.17	.12	.45***	.50***	.52***	.46***	-			
8. T2 Prosocial skills	.15	-.13	.05	.20*	.21*	.28**	.05	-		
9. T2 School readiness	.27**	.14	-.01	.08	.10	.17	.00	.58***	-	
Mean	-	60.00	3.91	3.55	3.60	4.12	3.44	3.88	3.97	
SD	-	7.23	.74	.72	.75	.56	.73	.72	.73	
Minimum	-	40.00	1.75	1.80	1.67	2.00	1.60	2.00	2.00	
Maximum	-	78.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	
Skewness	-	-.10	-.57	-.10	-.40	-.32	.06	-.30	-.61	
Kurtosis	-	-.63	-.06	-.45	-.05	.89	-.54	-.39	-.19	
Cronbach's alpha	-	-	.70	.78	.71	.70	.73	.91	.87	

Note: * $p < .05$; ** $p < .01$; *** $p < .001$. T1 = time 1; T2 = time 2; For child gender, boy = 0 and girl = 1.

associations between school readiness and different aspects of playfulness were all non-significant. Prosocial skills were positively related to school readiness ($r = .58, p < .001$) and three indicators of playfulness including social spontaneity, cognitive spontaneity, and manifest joy ($r_s = .20$ to $.28, p_s < .05$).

Structural equation model for predicting school readiness

A confirmatory factor analysis was conducted to examine the measurement model of playfulness. The measurement model including the five indicators of physical spontaneity, social spontaneity, cognitive spontaneity, manifest joy, and sense of humor, adequately fitted the data: $\chi^2 (5, N = 106) = 11.25, p = .05, CFI = .97, NNFI = .94, RMSEA = .09$ (90% CI: .01, .19), SRMR = .04. The factor loadings of the five indicators were significant and substantial in magnitude (.72 - .86). The structural model for predicting school readiness from playfulness and prosocial skills controlling for child age and gender was presented in Figure 1, which fitted the data well: $\chi^2 (23, N = 106) = 30.98,$

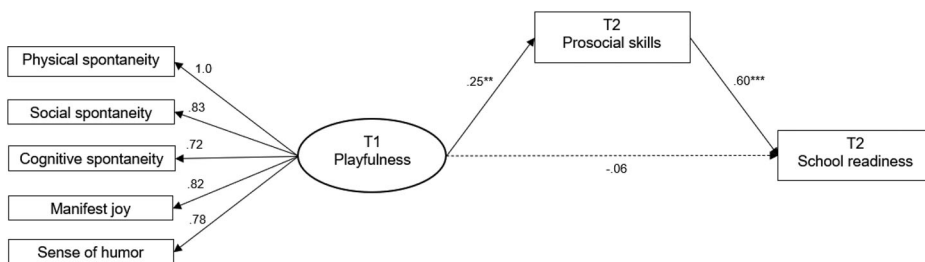


Figure 1. Structural equation model for predicting children’s school readiness from playfulness and prosocial skills controlling for child age and gender. Standardized coefficients are reported. Solid paths are statistically significant. Dashed paths are non-significant. T1 = time 1; T2 = time 2; * $p < .05$; ** $p < .01$; *** $p < .001$. Fit indices: $\chi^2 (23, N = 106) = 30.98, p = .12, CFI = .97, NNFI = .95, RMSEA = .06$ (90% CI: .00, .11), SRMR = .06, $R^2_{School\ readiness} = .42, R^2_{Prosocial\ skills} = .11$.

$p = .12$, $CFI = .97$, $NNFI = .95$, $RMSEA = .06$ (90% CI: .00, .11), $SRMR = .06$, $R^2_{School\ readiness} = .42$, $R^2_{Prosocial\ skills} = .11$. The relationships between (1) playfulness at time 1 and prosocial skills at time 2 ($\beta = .25$, $SE = .10$, $p < .01$), and (2) prosocial skills at time 2 and school readiness at time 2 ($\beta = .60$, $SE = .09$, $p < .001$) were both significant. Nevertheless, the direct relationship between playfulness at time 1 and school readiness at time 2 was non-significant ($\beta = -.06$, $SE = .09$, $p = .42$). The indirect relationship between playfulness at time 1 and school readiness at time 2 as mediated through children's prosocial skills at time 2 was significant ($\beta_{ind} = .15$, $p = .001$, 95% CI = [.07, .30]).

Discussion

This study examined the associations among playfulness, prosocial skills, and school readiness of Hong Kong Chinese kindergarten children. The results reveal that children's early playfulness positively predicted their prospective prosocial skills, while their prosocial skills and school readiness were positively associated. Importantly, the present findings have expanded the existing studies (e.g. Barnett 2018; Fink, Mareva, and Gibson 2020; Fung and Chung 2022a; Stacks and Oshio 2009; Ziv 2013) by demonstrating the possible mediating role of prosocial skills in the relationship between playfulness and school readiness of kindergarten children across time.

Indirect relationship among playfulness, prosocial skills, and school readiness

Aligned with the hypothesis, children's early playfulness positively predicted their later prosocial skills. Different aspects of playfulness can promote children's social participation in school play activities. Specifically, children with high levels of physical spontaneity may develop better motor planning, sequencing, and execution skills that enable them to enter social play effectively (Bar-Haim and Bart 2006). Likewise, children with advanced cognitive spontaneity may use their imagination and inventiveness to generate appealing play ideas and lead uncommon group play (Uren and Stagnitti 2009). Children showing high social spontaneity are able to engage and communicate with peers during play. Furthermore, those children demonstrating high levels of manifest joy and a sense of humor are more likely to express enthusiasm and generate a humorous atmosphere (Trevlas et al. 2003) that may contribute to the positive dynamic in group play. Taken together, children with high levels of playfulness may be more resourceful in initiating and gaining access to various peer play situations (Fung and Chung 2022a). These children may practise prosocial skills during play. At the same time, the advanced prosocial skills can also be manifested in non-play situations (e.g. volunteering to help teachers and peers in learning activities) and affect teachers' ratings on prosocial skills. Future research may explore whether heightened peer play participation might explain the relationship between kindergarten children's playfulness and prosocial skills.

Concurring with previous evidence underlining the predictive role of prosocial skills in school readiness (e.g. Blair and Raver 2015; Campbell et al. 2016), this study revealed a positive relationship between these skills and capacity. More importantly, the results demonstrated a significant indirect relationship between playfulness and school readiness via prosocial skills. The hypothesized model explained 11% and 42% variances in children's prosocial skills and school readiness, respectively. The present findings

extended our understanding of how kindergarten children's playfulness would possibly contribute to their future school readiness. For example, by developing better prosocial skills, playful children may adapt to the changing learning contexts in the kindergarten classroom and collaborate with peers in different learning activities more effectively (Galindo and Fuller 2010). Likewise, these children may develop harmonious relationships with teachers (Hernández et al. 2016). Having positive teacher-student relatedness may motivate them to regulate their cognition (e.g. attention, inhibition) and behaviors (e.g. impulsiveness), as reflected in their school readiness (i.e. academic and higher-order cognitive skills). Future work may include classroom adaptiveness and teacher-student relationships and investigate how these factors are associated with children's playfulness, prosocial skills, and school readiness.

The direct relationship between playfulness and school readiness

Unexpectedly, the direct link between playfulness and future school readiness was non-significant. Proyer (2011) reported a positive relationship between adults' playfulness and academic competence and further proposed that playfulness may function as a coping strategy for them to achieve academically. This proposition aligned with Saunders et al.'s (1999) results indicating the link between playfulness and coping among preschool children. In this study, however, children's advantages in playfulness did not translate into higher levels of school readiness. Adults may be able to use their playfulness to generate alternative mindsets or learning approaches to lower their anxiety in the face of stressful academic tasks (e.g. examination; Proyer 2011), but this coping may be too advanced for kindergarten children. Instead, the benefit of playfulness on kindergarten children's coping skills may manifest in the day-to-day peer interaction or conflict resolution, which was reflected in the positive association between playfulness and prosocial skills in the present findings. Given that the examination of the indirect relationship between predictor and outcome variables without a significant direct relationship is considered legitimate (Choe, Lee, and Read 2021; Hayes 2018), the findings point to the importance of including possible mediators in the examination of the relationship between playfulness and school readiness of kindergarten children. Apart from prosocial skills in the present investigation, future research may consider including other possible mediators that might explain the relationship between kindergarten children's playfulness and school readiness. For example, self-regulation and the underlying cognitive processes of executive functioning have been suggested to be important correlates of children's early play behaviors (Bodrova and Leong 2018) and school readiness (Blair and Raver 2015).

Limitations

The present study has at least three limitations. First, this study relied on informants' ratings of children's playfulness (i.e. parents), prosocial skills, and school readiness (i.e. teachers). As data collection was carried out during the COVID-19 pandemic, teachers had the reduced opportunity to observe children's play, and thus, parents were considered the appropriate informants of children's playfulness. Replication studies may use independent observational measures like the Test of Playfulness (Bundy et al. 2001) and

behavioral assessment of school readiness (e.g. reading, mathematics, self-control). Future research may investigate other elements, such as conflict resolution, communicative skills, relationship skills, self-knowledge, and self-management, to provide a more comprehensive perspective of children's social development. Second, although the present sample size met the minimum requirement of confirmatory factor analysis (Wolf et al. 2013) and parameter estimation (Kline 2010), the number of participants was small. Future research with a larger sample size is required to validate the present results by modeling children's prosocial skills and school readiness as latent factors. Lastly, this study used a correlational design, and the results indicated no direction of effects. Moreover, as both prosocial skills and school readiness were reported at time 2, the research design precluded inference about longitudinal mediation. Further longitudinal studies with repeated measures of prosocial skills and school readiness are needed to inform the causality better.

Conclusions and implications

Despite these limitations, the present study contributed to existing research by demonstrating the possible mediating role of prosocial skills in the relationship between playfulness and school readiness across time. More playful children may be able to develop better prosocial skills, which may, in turn, support their school readiness. Practically, the results of this study also suggest the utility of intervention efforts targeting kindergarten children's playfulness and prosocial skills to support their formal school transition. For instance, promoting parents' (Shen, Chick, and Pitas 2017) and teachers' (Pinchover 2017) levels of playfulness may be a promising approach to facilitating children's playfulness.

The present findings also support further implementing child-oriented play activities in the early childhood education and care settings to promote children's prosocial skills. For example, there is growing evidence to support the use of sociodramatic play (e.g. Fung and Cheng 2017; Uren and Stagnitti 2009) in the kindergarten context for children to practise their prosocial skills. The Tools of the Mind (Bodrova and Leong 2018), which highlights the positive role of sociodramatic play in children's social and cognitive development, is an evidence-based kindergarten program that promotes children's self-regulation and school readiness (Blair, McKinnon, and Daneri 2018; Diamond et al. 2019; Solomon et al. 2018). In particular, teachers should embrace children's spontaneous improvisation, flexible use of play materials (Canning 2010), and children's creative and imaginative play ideas (i.e. cognitive spontaneity) (Fung, Chung, and He 2021) to extend or change the direction of a continuous sociodramatic play. These approaches may support children's social development and school readiness in a more relaxed and appealing way.

Consent to participate

Informed consent was obtained from all participants in the study.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Ethics approval

Approval was obtained from the Human Research Ethics Committee of the Education University of Hong Kong (ref: 2019-2020-0391). All procedures performed in studies involving human participants were in accordance with the institution's ethical standards and the 1964 Helsinki Declaration.

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References

- Bar-Haim, Y., and O. Bart. 2006. "Motor Function and Social Participation in Kindergarten Children." *Social Development* 15 (2): 296–310. doi:10.1111/j.1467-9507.2006.00342.x.
- Barnett, L. A. 1991. "The Playful Child: Measurement of a Disposition to Play." *Play & Culture* 4 (1): 51–74.
- Barnett, L. A. 2018. "The Education of Playful Boys: Class Clowns in the Classroom." *Frontiers in Psychology* 9: 232. doi:10.3389/fpsyg.2018.00232.
- Bautista, A., J. Yu, K. Lee, and J. Sun. 2021. "Play in Asian Preschools? Mapping a Landscape of Hindering Factors." *Contemporary Issues in Early Childhood* 22 (4): 312–327. doi:10.1177/146394912111058035.
- Beatty, J. J. 2014. *Observing Development of the Young Child* (8th edition). New York: Pearson.
- Blair, C., R. D. McKinnon, and M. P. Daneri. 2018. "Effect of the Tools of the Mind Kindergarten Program on Children's Social and Emotional Development." *Early Childhood Research Quarterly* 43: 52–61. doi:10.1016/j.ecresq.2018.01.002.
- Blair, C., and C. Raver. 2015. "School Readiness and Self-Regulation: A Developmental Psychobiological Approach." *Annual Review of Psychology* 66 (1): 711–731. doi:10.1146/annurev-psych-010814-015221.
- Bodrova, E., and D. J. Leong. 2018. "Tools of the Mind: The Vygotskian-Based Early Childhood Program." *Journal of Cognitive Education and Psychology* 17 (3): 223–237. doi:10.1891/1945-8959.17.3.223.
- Bundy, A. C., L. Nelson, M. Metzger, and K. Bingaman. 2001. "Validity and Reliability of a Test of Playfulness." *The Occupational Therapy Journal of Research* 21 (4): 276–292. doi:10.1177/153944920102100405.
- Campbell, S. B., S. A. Denham, G. Z. Howarth, S. M. Jones, J. V. Whittaker, A. P. Williford, M. T. Willoughby, M. Yudron, and K. Darling-Churchill. 2016. "Commentary on the Review of Measures of Early Childhood Social and Emotional Development: Conceptualization, Critique, and Recommendations." *Journal of Applied Developmental Psychology* 45: 19–41. doi:10.1016/j.appdev.2016.01.008.
- Canning, N. 2010. "The Influence of the Outdoor Environment: Den-Making in Three Different Contexts." *European Early Childhood Education Research Journal* 18 (4): 555–566. doi:10.1080/1350293X.2010.525961.
- Choe, S. Y., J. O. Lee, and S. J. Read. 2021. "Parental Psychological Control Perceived in Adolescence Predicts Jealousy Toward Romantic Partners in Emerging Adulthood via Insecure Attachment." *Social Development*, doi:10.1111/sode.12514.

- Curriculum Development Council. 2017. Kindergarten education curriculum guide: Joyful learning through play, balanced development all the way. https://www.edb.gov.hk/attachment/en/curriculum-development/major-level-of-edu/preprimary/ENG_KGECG_2017.pdf.
- Denham, S. A., and C. Brown. 2010. "Plays Nice With Others": Social-Emotional Learning and Academic Success." *Early Education & Development* 21 (5): 652–680. doi:10.1080/10409289.2010.497450.
- Diamond, A., C. Lee, P. Senften, A. Lam, and D. Abbott. 2019. "Randomized Control Trial of Tools of the Mind: Marked Benefits to Kindergarten Children and Their Teachers." *PloS One* 14 (9): e0222447–e0222447. doi:10.1371/journal.pone.0222447.
- Du, Y., J. Kou, and D. Coghill. 2008. "The Validity, Reliability and Normative Scores of the Parent, Teacher and Self Report Versions of the Strengths and Difficulties Questionnaire in China." *Child and Adolescent Psychiatry and Mental Health* 2 (1): 8–8. doi:10.1186/1753-2000-2-8.
- Duncan, G. J., C. J. Dowsett, A. Claessens, K. Magnuson, A. C. Huston, P. Klebanov, L. S. Pagani, et al. 2007. "School Readiness and Later Achievement." *Developmental Psychology* 43: 1428–1446. doi:10.1037/0012-1649.43.6.1428.
- Eisenberg, N., C. Valiente, and N. Eggum. 2010. "Self-regulation and School Readiness." *Early Education & Development* 21: 681–698. doi:10.1080/10409289.2010.497451.
- Fink, E., S. Mareva, and J. L. Gibson. 2020. "Dispositional Playfulness in Young Children: A Cross-Sectional and Longitudinal Examination of the Psychometric Properties of a new Child Self-Reported Playfulness Scale and Associations with Social Behaviour." *Infant and Child Development* 29 (4): e2181. doi:10.1002/icd.2181.
- Fung, C. K. H., and D. P. W. Cheng. 2012. "Consensus or Dissensus? Stakeholders' Views on the Role of Play in Learning." *Early Years* 32: 17–33. doi:10.1080/09575146.2011.599794.
- Fung, W., and R. W. Cheng. 2017. "Effect of School Pretend Play on Preschoolers' Social Competence in Peer Interactions: Gender as a Potential Moderator." *Early Childhood Education Journal* 45 (1): 35–42. doi:10.1007/s10643-015-0760-z.
- Fung, W. K., and K. K. H. Chung. 2021. "Associations between Overexcitabilities and Playfulness of Kindergarten Children." *Thinking Skills and Creativity* 40: 100834. doi:10.1016/j.tsc.2021.100834.
- Fung, W. K., and K. K. H. Chung. 2022. "Association between Children's Home Play Opportunity and School Readiness: Object and Social Mastery Motivation as Mediators?" *Early Education and Development*, 1–12. doi:10.1080/10409289.2022.2153354.
- Fung, W. K., and K. K. H. Chung. 2022. "Parental Play Supportiveness and Kindergartners' Peer Problems: Children's Playfulness as a Potential Mediator." *Social Development*, doi:10.1111/sode.12603.
- Fung, W. K., K. K. H. Chung, and M. W. He. 2021. "Association between Children's Imaginational Overexcitability and Parent-Reported Creative Potential: Cognitive and Affective Play Processes as Potential Mediators." *The Journal of Creative Behavior* 55 (4): 962–969. doi:10.1002/jocb.501.
- Fung, W. K., K. K. H. Chung, I. C. B. Lam, and N. X. Li. 2020. "Bidirectionality in Kindergarten Children's School Readiness and Emotional Regulation." *Social Development* 29 (3): 801–817. doi:10.1111/sode.12434.
- Galindo, C., and B. Fuller. 2010. "The Social Competence of Latino Kindergartners and Growth in Mathematical Understanding." *Developmental Psychology* 46 (3): 579–592. doi:10.1037/a0017821.
- Goodman, R. 1997. "The Strengths and Difficulties Questionnaire: A Research Note." *Journal of Child Psychology and Psychiatry* 38 (5): 581–586. doi:10.1111/j.1469-7610.1997.tb01545.x.
- Gumpel, T. P. 1999. "Use of Item Response Theory to Develop a Measure of First-Grade Readiness." *Psychology in the Schools* 36: 285–293. doi:10.1002/(SICI)1520-6807(199907)36:4<285::AID-PITS2>3.0.CO;2-M.
- Hayes, A. F. 2009. "Beyond Baron and Kenny: Statistical Mediation Analysis in the new Millennium." *Communication Monographs* 76 (4): 408–420. doi:10.1080/03637750903310360.
- Hayes, A. F. 2018. *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach* (Second edition). Guilford Press.

- Hernández, M. M., N. Eisenberg, C. Valiente, S. K. VanSchyndel, T. L. Spinrad, K. M. Silva, R. H. Berger, et al. 2016. "Emotional Expression in School Context, Social Relationships, and Academic Adjustment in Kindergarten." *Emotion* 16 (4): 553–566. doi:10.1037/emo0000147.
- Ho, D. S. T., C. Leung, and S. K. Lo. 2013. "Validation of the Gumpel Readiness Inventory for Preschool Children in Hong Kong." *Research in Developmental Disabilities* 34: 3066–3076. doi:10.1016/j.ridd.2013.05.039.
- Hu, L., and P. M. Bentler. 1999. "Cutoff Criteria for fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus new Alternatives." *Structural Equation Modeling: A Multidisciplinary Journal* 6: 1–55. doi:10.1080/10705519909540118.
- Jackson, S. L., and S. A. Cunningham. 2017. "The Stability of Children's Weight Status Over Time, and the Role of Television, Physical Activity, and Diet." *Preventive Medicine* 100: 229–234. doi:10.1016/j.ypmed.2017.04.026.
- Keleş, S., and Ö Yurt. 2017. "An Investigation of Playfulness of pre-School Children in Turkey." *Early Child Development and Care* 187 (8): 1372–1387. doi:10.1080/03004430.2016.1169531.
- Kline, R. B. 2010. *Principles and Practice of Structural Equation Modeling*, Third Edition. New York: Guilford Publications.
- Lai, K. Y. C., E. S. L. Luk, P. W. L. Leung, A. S. Y. Wong, L. Law, and K. Ho. 2010. "Validation of the Chinese Version of the Strengths and Difficulties Questionnaire in Hong Kong." *Social Psychiatry and Psychiatric Epidemiology* 45 (12): 1179–1186. doi:10.1007/s00127-009-0152-z.
- Lau, M. M., and H. Li. 2018. "Is Whole-day Kindergarten Better than Half-day Kindergarten? A Mixed Methods Study of Chinese Educators' Perceptions." *Children and Youth Services Review* 93: 365–377. doi:10.1016/j.childyouth.2018.07.007.
- Li, X., C. B. Lam, and K. K. H. Chung. 2020. "Linking Maternal Caregiving Burden to Maternal and Child Adjustment: Testing Maternal Coping Strategies as Mediators and Moderators." *Journal of Developmental and Physical Disabilities* 32 (2): 323–338. doi:10.1007/s10882-019-09694-0.
- Newton, E., and V. Jenvey. 2011. "Play and Theory of Mind: Associations with Social Competence in Young Children." *Early Child Development and Care* 181 (6): 761–773. doi:10.1080/03004430.2010.486898.
- Oberski, D. 2014. "Lavaan.Survey: An R Package for Complex Survey Analysis of Structural Equation Models." *Journal of Statistical Software* 57: 1–27. doi:10.18637/jss.v057.i01.
- Piaget, J. 1976. *The Child and Reality*. London: Penguin Books.
- Pinchover, S. 2017. "The Relation between Teachers' and Children's Playfulness: A Pilot Study." *Frontiers in Psychology* 8: 2214–2214. doi:10.3389/fpsyg.2017.02214.
- Portilla, X. A., P. J. Ballard, N. E. Adler, W. T. Boyce, and J. Obradović. 2014. "An Integrative View of School Functioning: Transactions between Self-Regulation, School Engagement, and Teacher–Child Relationship Quality." *Child Development* 85: 1915–1931. doi:10.1111/cdev.12259.
- Proyer, R. T. 2011. "Being Playful and Smart? The Relations of Adult Playfulness with Psychometric and Self-Estimated Intelligence and Academic Performance." *Learning and Individual Differences* 21 (4): 463–467. doi:10.1016/j.lindif.2011.02.003.
- R Core Team. 2020. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. <https://www.R-project.org/> Assessed 18 December 2020.
- Rentzou, K. 2014. "Preschool Children's Social and Nonsocial Play Behaviours. Measurement and Correlations with Children's Playfulness, Behaviour Problems and Demographic Characteristics." *Early Child Development and Care* 184 (4): 633–647. doi:10.1080/03004430.2013.806496.
- Saunders, I., M. Sayer, and A. Goodale. 1999. "The Relationship between Playfulness and Coping in Preschool Children: A Pilot Study." *The American Journal of Occupational Therapy* 53 (2): 221–226. doi:10.5014/ajot.53.2.221.
- Shen, X., G. Chick, and N. A. Pitas. 2017. "From Playful Parents to Adaptable Children: A Structural Equation Model of the Relationships between Playfulness and Adaptability among Young Adults and Their Parents." *International Journal of Play* 6 (3): 244–254. doi:10.1080/21594937.2017.1382983.

- Solomon, T., A. Plamondon, A. O'Hara, H. Finch, G. Goco, P. Chaban, L. Huggins, B. Ferguson, and R. Tannock. 2018. "A Cluster Randomized-Controlled Trial of the Impact of the Tools of the Mind Curriculum on Self-Regulation in Canadian Preschoolers." *Frontiers in Psychology* 8: 2366–2366. doi:[10.3389/fpsyg.2017.02366](https://doi.org/10.3389/fpsyg.2017.02366).
- Stacks, A. M., and T. Oshio. 2009. "Disorganized Attachment and Social Skills as Indicators of Head Start Children's School Readiness Skills." *Attachment & Human Development* 11 (2): 143–164. doi:[10.1080/14616730802625250](https://doi.org/10.1080/14616730802625250).
- Stühmann, L. M., R. Paprott, C. Heidemann, T. Ziese, S. Hansen, D. Zahn, C. Scheidt-Nave, and P. Gellert. 2020. "Psychometric Properties of a Nationwide Survey for Adults with and Without Diabetes: The "Disease Knowledge and Information Needs - Diabetes Mellitus (2017)" Survey." *BMC Public Health* 20 (1): 192. doi:[10.1186/s12889-020-8296-6](https://doi.org/10.1186/s12889-020-8296-6).
- Trevas, E., V. Grammatikopoulos, N. Tsigilis, and E. Zachopoulou. 2003. "Evaluating Playfulness: Construct Validity of the Children's Playfulness Scale." *Early Childhood Education Journal* 31 (1): 33–39. doi:[10.1023/A:1025132701759](https://doi.org/10.1023/A:1025132701759).
- Uren, N., and K. Stagnitti. 2009. "Pretend Play, Social Competence and Involvement in Children Aged 5–7 Years: The Concurrent Validity of the Child-Initiated Pretend Play Assessment." *Australian Occupational Therapy Journal* 56 (1): 33–40. doi:[10.1111/j.1440-1630.2008.00761.x](https://doi.org/10.1111/j.1440-1630.2008.00761.x).
- Vygotsky, L. 1967. "Play and its Role in the Mental Development of the Child." *Soviet Psychology* 5 (3): 6–18. doi:[10.2753/RPO1061-040505036](https://doi.org/10.2753/RPO1061-040505036).
- Wolf, E. J., K. M. Harrington, S. L. Clark, and M. W. Miller. 2013. "Sample Size Requirements for Structural Equation Models." *Educational and Psychological Measurement* 73 (6): 913–934. doi:[10.1177/0013164413495237](https://doi.org/10.1177/0013164413495237).
- Ziv, Y. 2013. "Social Information Processing Patterns, Social Skills, and School Readiness in Preschool Children." *Journal of Experimental Child Psychology* 114 (2): 306–320. doi:[10.1016/j.jecp.2012.08.009](https://doi.org/10.1016/j.jecp.2012.08.009).