

Kong, M. M. Y., & Au, T. K. F. (2018). The Incredible Years Parent Program for Chinese Preschoolers With Developmental Disabilities. *Early Education and Development*, 29(4), 494-514.

The Incredible Years Parent Program for Chinese Preschoolers with Developmental Disabilities

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The authors thank the Incredible Years parent program developer Prof. Carolyn Webster-Stratton for allowing us to use the program, certified Incredible Years trainer Kimberlee Shoecraft for reviewing our videos and for her detailed and helpful feedback, and CEO Virginia Wilson and Senior Clinical Psychologist Dr. Yvonne Becher at the Child Development Centre in Hong Kong for allowing us to conduct this research at the Centre. We are grateful to a team of dedicated research assistants and interns for assisting with data collection, coding, and analysis, and to Karen Ravn for her valuable comments on our manuscript. We are especially thankful to the participating families for their trust and support. Portions of this study have been presented in a poster at the Hong Kong ASD Conference 2017 and an invited lecture at the Montessori Asia Conference Hong Kong 2017. This study has not been published elsewhere and has not been submitted simultaneously for publication elsewhere.

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Abstract

Objective: To evaluate the effectiveness of Incredible Years Basic Parent Training in a community clinic setting in Hong Kong. *Background:* Incredible Years Basic Parent Training is a program designed to promote children's academic, social and emotional regulation skills and to reduce conduct problems for typically developing children. Developed in the West and shown to be effective there, it has not been tested in non-Western cultures, where the challenges for parents of children with developmental disabilities can be different.

Method: The Incredible Years program was slightly adapted to accommodate to cultural characteristics in Hong Kong. Parents of 52 preschool children with developmental disabilities were randomly assigned to either the Incredible Years program or waitlist control. The behaviors of the children and their parents were assessed before and after the 12-week intervention/waitlist period via self- and spouse/kin-reports and videotape-coding by observers blind to the intervention/waitlist status.

Results: Significant intervention benefits were found, including: (1) an increase in positive and reciprocal parent-child interaction; (2) a reduction in parental stress; and (3) a decrease in oppositional behavior by the children. The parents' attendance was high as were their satisfaction with the program and compliance with assigned homework.

Conclusion: Incredible Years Basic Parent Training, when implemented with cultural sensitivity, can be effective for—and well received by—Chinese parents of preschool children with developmental disabilities in a community setting.

Keywords: developmental disabilities; parent coaching; parent-child interaction; Chinese culture; Incredible Years Parent Training Program

The Incredible Years Parent Program for Chinese Preschoolers with Developmental Disabilities

Reports of children with developmental disabilities—including Autism Spectrum Disorders (ASD), developmental delay, language delay and Attention Deficit and Hyperactivity Disorder (ADHD)—have been rising in Hong Kong (Department of Health, 2014) as they have in the U.S. (Boyle et al., 2011). But tracking and comparing such prevalence across cultures is never easy. The same assessment tools and clinical norms may not always apply. For example, using tools and norms developed in the West (e.g., in Omaha, Nebraska) to diagnose Chinese children in Hong Kong might lead to a simplistic understanding of neurodevelopmental disorders (Norbury & Sparks, 2013). A case in point: the Autism Diagnostic Observation Schedule (ADOS: Lord, Rutter, DiLavore, & Risi, 1999) assesses children's social interaction by measuring whether children make appropriate eye contact. But this may not work well in Hong Kong where there are no established norms for how much eye contact is appropriate between children and unfamiliar adults. Eye contact can even show disrespect in some Asian cultures (Rivera & Adkinson, 1997).

The challenges that developmental disabilities present for children and their families are sometimes culture-specific too. For example, developmental disabilities can lead to problems in school, and those, in turn, can lead to stress in any family (McIntyre, Blacher, & Baker, 2006; Ho, Yeh, McCabe, & Lau, 2012; Mah & Johnston, 2012). But such stress may be magnified in cultures like the Chinese that value academic achievement especially highly (Chao, 1994).

In addition, attitudes about developmental disabilities can vary from culture to culture. Chinese parents, more than most, see such disabilities as embarrassing, perhaps shameful (Hu, Wang, & Fei, 2012; Wong et al., 2004), or even a punishment for the family (Mak & Chen, 2010). And they may suffer affiliate stigma (Mak & Cheung, 2008): a stigma experienced by family caregivers of individuals with disabilities (Mehta & Farina, 1988). Unfortunately and, of course, unwittingly, parents of children with developmental disabilities in Hong Kong may be contributing to their problems. For one thing, they may be convinced that their children will not succeed in school unless they learn English as well as Chinese. And so they may focus on “educational” English, teaching them numbers and color/shape names (Norbury & Sparks, 2013), during times when they could simply be having natural conversations together in their native language. Furthermore, Hong Kong parents may not spend as much time playing with their children as many parents in the West do, perhaps because circumstances restrict their free time (cf. Mbise & Kysela, 1990), but also because in the traditional Chinese culture it is unusual for adults to play with children. For these same reasons, Chinese parents may resist child-centered intervention programs that involve following the child's lead in play, talking positively about what the child is doing, or engaging in pretend play. But missing out on play time can undermine children's chance to develop age-appropriate language, emotional self-regulation, and social skills.

To date, the most widely used programs for helping parents of children with developmental disabilities have been developed and evaluated in the West. The National Institute for Health and Clinical Excellence (NICE) provides evidence-based guidelines to health care professionals for best practices in the U.K. NICE has rated the Webster-Stratton Incredible Years

Program and the Triple-P (Positive Parenting Program) to be both clinically effective and cost effective for training/educating parents of children with conduct disorders.

Both are Blueprints Programs, meaning independent panels of evaluation experts have concluded that, to some extent at least, they can change targeted behaviors and developmental outcomes. Blueprints Programs are rated as either *Promising* (meeting a minimum standard of effectiveness) or *Model* (meeting a higher standard of effectiveness). This impactful classification helps funding bodies select scientific, evidence-based programs instead of unproven or even harmful programs that waste scarce health resources. The Incredible Years Parent Training (IYPT) Program was rated as promising, satisfying standards of *Intervention specificity* (the program clearly identifies a target outcome), *Evaluation quality* (at least one high-quality randomized controlled trial or two high-quality quasi-experimental evaluations have been held), *Intervention impact* (in these evaluations the program yielded the intended outcomes, with no evidence of harmful effects), and *Dissemination readiness* (the program is currently available to the public for dissemination with fidelity).

Existing Parenting Interventions in Hong Kong for Children with Disabilities

Successful interventions for families of children with disabilities should help both the children themselves and their parents, who may experience deficits in social and emotional functioning (Lau et al., 2006) as well as high levels of stress due to the children's academic problems. A meta-analysis by Dyches, Smith, Korth, Roper, & Mandlco (2012) found a moderate association between positive parenting (authoritative parents who are responsive to the child's emotional need and at the same time setting and enforcing clear and predictable limits) and good behavior among children with developmental disabilities. Moreover, change in parenting strategies might be the mediator between intervention and child behavior outcomes (Gardner, Burton, & Klimes, 2006). Moreover, parent-child relationship predicted both parenting behavior and child behavior problems. How a parent responds to a child's behavior depends on the parent's relationship with the child, suggesting that interventions for families of children with developmental disabilities should aim at enhancing parent-child relationships and increasing the use of effective parenting strategies (Schuiringa, van Nieuwenhuizen, deCastro, & Matthys, 2015).

Parents in Hong Kong with children who have, or are at risk for developing, behavioral problems are offered the Level 4 Group Triple-P Program under the Hong Kong Health System at publicly funded Maternal and Child Health Centres, regardless of whether they have developmental disabilities. But while the program is effective at improving the behavior of children with behavioral concerns, it's unclear whether the program is effective at reducing their parents' stress. One study showed that it was (Leung, Fan, & Sanders, 2013), although with a smaller effect size than that for Chinese parents of typically developing children (Leung, Sanders, Leung, Mak, & Lau, 2003). But in another study, family stress and need, and satisfaction with being a parent remained unchanged (Au et al., 2014).

Local implementation of Triple-P, then, reduces behavioral problems for children with or without developmental disabilities. However, its benefits for the well-being of parents of children with developmental disabilities remain uncertain, perhaps because it places limited emphasis on coaching parents to support their children's development. The Group Stepping Stones Triple-P

program is a version of the original Triple-P program adapted especially for parents of children with disabilities. But only one of the nine sessions in this version focuses on promoting positive parent-child relationships and encouraging desirable behaviors (Sanders, Mazzucchelli, & Studman, 2009a, b). So even if it were to be translated and implemented in Hong Kong, there's little reason to believe that it would be of great use in reducing parents' stress.

A related program, the 8-session Happy Parenting program, has been developed locally in Hong Kong for parents of children with developmental disabilities (Leung, Chan, Lam, Yau, & Tsang, 2016). Parents have reported positive results: their children's behavior has improved and their own stress has gone down, along with their reliance on dysfunctional discipline strategies. It remains to be seen whether such self-reports will be corroborated by behavioral observations, and whether the reduction in children's problem behaviors will be accompanied by an increase in their social skills and academic performance. Establishing systematic fidelity checks across all facilitators will also be necessary for future evaluation of this program.

The Incredible Years Parent Training (IYPT) Program

Incredible Years Basic (core) Parent Training (IYPT Basic) is the other Blueprints Program recommended by the NICE guidelines. Developed in 1980 (Webster-Stratton, 1981), it has since been revised and updated to include four different curriculum designed to fit the developmental stage of the child: Baby Program (4 weeks to 9 months), Toddler Program (1- 3 years), Preschool Program (3-5 years) and School-Age Program (6–12 years) (Webster-Stratton, 2016). These programs are designed to teach important parenting skills that promote children's social competence, emotional regulation and academic achievement, and to reduce behavior problems. In the Basic preschool program, parents—in groups of 8 to 12—see at least 196 video vignettes. Drawn from a collection of over 300, with each lasting one to three minutes, the videos are intended to stimulate focused discussions and collaborative learning among the parents. The Basic preschool program begins by teaching parents to use child-directed interactive play, academic and persistence coaching, social and emotional coaching, and praise and incentive programs. Next, parents learn to set up predictable home routines and rules and to use a specific set of nonviolent discipline techniques—e.g., verbal commands, natural and logical consequences, time-outs. Finally, parents learn to teach their children problem-solving skills that can reduce frustration and enhance self-efficacy.

Evidence Supporting the Incredible Years Parent Program

The IY BASIC parent treatment program for children (ages 2–8 years) diagnosed with Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) has been efficacious in eight randomized control trials (RCTs) published by the program developer plus numerous replications by independent investigators (Webster-Stratton, 2016). A recent meta-analysis of 50 studies found that IY intervention groups outperformed control/comparison groups in improving child behavior in a diverse range of families, especially those with children who had the most severe disruptive behaviors, and the IY program was judged well-established (Menting, Orobio de Castro, & Matthys, 2013).

Not many studies of IY programs have been done with children with developmental disabilities. In one, with preschoolers in the U.S., IY outperformed care-as-usual in reducing

negative and inappropriate parent-child interactions and child problem behaviors (McIntyre, 2008a,b). Similar benefits were found for parents of Portuguese preschoolers with ADHD behaviors (Azevedo, Seabra-Santos, Gaspar, & Homem, 2013), and intervention benefits for both children and mothers remained significant one year after program onset (Azevedo, Seabra-Santos, Gaspar, & Homem, 2014). But perhaps these documented program benefits depended on the experience and staff support of group leaders. The program might be less effective if conditions were less optimal (Lau, Chan, Li, & Au, 2010). Suppose the program were translated, adapted, implemented and evaluated in a real-world community setting in another culture with realistic limitations on staff resources and funding. How effective would it be then?

Key Characteristics of the IYPT

IYPT is based on this core principle: a strong and positive parent-child relationship is a key to effective discipline. Strategies aimed at fostering a positive relationship foundation—such as positive parent attention, communication, and child-directed play interactions designed to build secure and trusting relationships—must be taught before disciplinary strategies to reduce misbehaviors. (Webster-Stratton, 2016). Target topics include effective play techniques (child-directed play), preparing children emotionally and socially for school (social and emotion coaching), and supporting educational achievement (academic and persistence coaching). Note that Hong Kong Chinese parents of children at risk for developmental delays reportedly found these topics among the most important (Lau, Chow, & Lo, 2006). The program also coaches parents on: collaborating with teachers, providing and receiving support, acquiring new problem-solving skills themselves, teaching problem-solving skills to their children, managing anger and conflict, dealing with problematic child behaviors (e.g., calming, ignoring, establishing logical consequences), using effective discipline methods (e.g., determining boundaries, rules, routines and responsibilities) (Webster-Stratton, 2016).

Note that the Triple-P Parent Program relies on instructional methods such as small group practices, seminars/conferences on positive parenting practices, feedback, role-play, rehearsal, modeling and didactic videos to explain psychological theories underpinning the strategies the program uses (e.g., direct teaching of what attention to give, and what not to). Only one session of Triple-P focuses on promoting children's socioemotional development, with the focus mainly on behavioral modification strategies for teaching children new skills (e.g., communication, problem-solving, self-care, and self-regulation skills) and managing child misbehaviors (Sanders, Mazzucchelli, & Studman, 2009b).

By contrast, the main instructional method of IYPT is the extensive use of video presentations to model positive parent-child interactions (Arkan, Üstün, & Güvenir, 2012). According to Bandura's (1977) social learning theory, parents' watching videos of adult-child interactions that promote prosocial behaviors and decrease inappropriate behaviors should improve the parents' behavioral interactions with their own children. And IYPT group leaders do not simply state and explain the concepts illustrated in the videos. They pose questions to engage the parents in a guided collaborative process so the parents come up with the key concepts themselves. Such video demonstrations and discussions may be especially helpful for parents with less verbally oriented children. This method may also promote cultural sensitivity and better generalization as it allows parents to express the pros and cons of applying the suggested parenting strategies in the local environment of Hong Kong.

Improving caregiver-child interaction and hence their relationship can lead to self-sustaining improvements in the child's developmental outcomes. For example, scaffolding young children diagnosed with ASD to achieve joint attention with adult caregivers led to better language and socioemotional developmental outcomes (Kasari, Freeman, & Paparella, 2006). We chose to translate and implement the IYPT because of its breadth and depth in helping parents to become better social, emotional, academic, and persistence coaches for their children, covering topics on child-directed play (following a child's lead, ideas and imagination rather than imposing the caregiver's own way on the child), descriptive commenting (describing their child's actions and naming objects that the child is looking at) and verbal responsiveness (scaffolding and expanding on what the child said).

It seems likely that several IYPT key characteristics may be especially helpful to Chinese parents of children with developmental disabilities. First, the traditional Chinese culture emphasizes "teaching" and "training" children and considers children's academic achievement an important indicator of successful parenting (Chao, 1994). Compared to North American parents, Chinese parents are more likely to use punishment as a method of discipline and more likely to use high-power coercive strategies (Chen et al., 1998), so discouraging such approaches would seem especially important. Traditional Confucian principles require that children show respect to their elders, and, in return, the elders must teach and discipline the children. In order to maintain social harmony, particularly in the family (Chao, 1994), both parties must fulfill their expected roles.

Yet contemporary Chinese parents have become more open to Western parenting practices. Most parents of preschoolers in Hong Kong and Taiwan share a hybrid of Western and Eastern parenting ideologies: with elements of training and shame coming from the traditional Chinese culture and authoritative and autonomy ideas from the West (Lieber, Fung, & Leung, 2006). Based on the Confucian notion, Eastern parenting ideologies prescribe that parents should train the child to be socially and morally responsible and that shame serves as a key emotion in the socialization of children's social sensibilities. Western parenting ideologies include beliefs that parents should encourage and nurture children's self-esteem, independence, and expressions of opinions and feelings. Way et al. (2013) analyzed the narratives from 24 Chinese mothers of middle school students in Nanjing, Mainland China, and found that many Chinese mothers expressed goals for their children beyond academic success to include being happy, self-sufficient, and socially and emotionally well-adjusted. Most Chinese parents are now open and eager to broaden their parenting strategies to better equip their children to function flexibly in a world that is rapidly becoming more globalized. Will parent coaching programs developed in the West—fortified with cultural adaptations—serve them well?

The Current Study

While considerable empirical evidence in the West attests to the effectiveness of IYPT, the program has not been evaluated rigorously with Chinese parents of children with developmental disabilities. Our study is not only the first ever implementation of the IYPT in Asia, but is also the first anywhere to include micro-level behavioral coding of joint attention and verbal responsiveness as outcome measures in evaluating the IYPT. This study is also unique in using a Western program to investigate the applicability of teaching parents to use culturally-foreign parenting techniques (to coach children's academic, social and emotional

development) The research questions include: 1) Will the IYPT be effective in reducing stress for Chinese parents? 2) Will the program be acceptable to parents in Hong Kong? 3) Will the program promote the use of parenting strategies that are associated with positive developmental outcomes?

Method

Participants

Parents from 52 families, each with a 3- to 6-year-old with at least one diagnosed developmental delay/disability, were recruited from the Child Development Centre (CDC) in Hong Kong—a community clinic subsidized by the Social Welfare Department of the local government. The children had been diagnosed using DSM-IV-TR (American Psychiatric Association, 2000) and referred by psychologists or pediatricians in publicly funded or private practices. Their diagnoses included: ASD, Developmental Delay (speech, social, cognitive, and/or physical), ADHD Disorder, Pervasive Developmental Disorder, intellectual disabilities.

The 52 participating families were randomly assigned to either the intervention group ($n = 26$) or a waitlist-control group ($n = 26$). Five families dropped out of the study: one parent from the treatment group became uncontactable; the remaining four were from the waitlist-control group and could not continue because of family relocation and difficulties arranging childcare (see Figure 1 for the flowchart illustrating the research design). Participants who dropped out did not differ from the remaining participants on any of the following demographic measures: parental gender composition and marital status, parental employment status, private vs. public funding and child gender (Fisher's Exact tests $ps > .1$); parent's mean age, $F(1,42) = .32, p = .07$; child's mean age at pretest, $F(1,50) = .77, p > .3$. Among the remaining 47 parents who served as the target children's primary-caregivers, 40 (85%) were mothers (aged 29 to 46); 19 had been randomly assigned to the intervention group and 21 to the waitlist-control group. Seven (15%) were fathers between ages 28 and 42, with 6 in the intervention group and 1 in the waitlist control.

Potential baseline differences between the intervention and waitlist-control group were examined in two ways: for categorical data, with the Chi-square test and then, if any expected frequency was smaller than 5, the Fisher's Exact test; and for interval data with ANOVA. The two groups did not differ on any of the following demographic measures: parental gender composition and marital status, Fisher's Exact tests $ps > .1$; parental employment status, private vs. public funding, and child gender, Chi-square tests $X^2s < .001, ps > .3$; parent's mean age, $F(1,37) = .78, p > .3$; child's mean age at pretest, $F(1,45) = .04, p > .8$. However, the two groups of parents differed on education level, with 72% of the parents in the intervention group and only 55% in the waitlist control having received university-level education ($X^2(1, N = 46) = 7.05, p = .008$). In subsequent analysis, parental education level was included as a covariate in assessing intervention effects.

All 47 parents included in the study completed both the pretest and posttest assessment. The array and distribution of developmental disabilities were comparable in the intervention and

waitlist groups. Children's diagnoses and their comorbidity status, if any, are presented in Table 1.

The children who had been diagnosed with Developmental Delay (DD)—14 in the intervention group and 10 in the control—were further screened at a CDC downtown site with easy access via public transportation. Each child's developmental level was substantially behind the age norm in two or more developmental domains, including cognitive and intellectual, gross motor, fine motor, language, social and adaptive development (Petersen, Kube, & Palmer, 1998).

Procedure

The study received research ethics approval from both the University of Hong Kong and the clinical site (CDC). Children were recruited through health care professionals and teachers at the CDC. Eligible and interested parents were given an information packet, which included a cover letter describing the study, a demographic questionnaire, a registration form, and an informed consent form.

The 52 parents enrolled in this study were randomly assigned to either the intervention group ($n = 26$) or a waitlist-control group ($n = 26$). A clinic assistant who collected the pre-assessments conducted the random assignment by random lottery. Parents were assessed before and two weeks after the 12-week intervention/waitlist period (pretest and posttest respectively). Parents in the waitlist-control group received the intervention afterward; they did not receive any parenting services during the waiting period.

The sample socio-demographic characteristics are reported in Table 2. The participants were mostly employed married mothers, with approximately half receiving government subsidies.

Measures

Dyadic Parent-Child Interaction Coding System (DPICS). The DPICS system (Eyberg, Nelson, Duke, & Boggs, 2004) assessed the quality of parent-child interactions through observations of dyads in clinical setting, with good inter-rater reliability documented for Hong Kong Chinese families (Leung, Tsang, Ng, & Choi, 2017). We used DPICS III and added some variables (e.g., micro-level behavioral coding of joint attention and verbal responsiveness) to better assess the effectiveness of the IYPT for parents of children with special educational needs.

Each parent-child dyad was videotaped for subsequent behavioral coding in three standard 5-minute situations: playing with toys chosen by the child (Phase 1), playing with toys chosen by the parent (Phase 2), and getting the child to help clean up the toys (Phase 3). For each situation, parents were rated on six types of behaviors: Negative talk, Direct command, Indirect command, Labeled praise, Unlabeled and non-specific praise, Verbal responsiveness. Children were rated on four types: Affect, Responding to joint attention bid, Compliance, Non-compliance. These variables were primarily adapted from the DPICS-III (Eyberg et al., 2004; online Supplement 1), with codes for joint attention from Kasari et al. (2006; Supplement 2) and for parents' verbal responsiveness from McDuffie and Yoder (2010; Supplement 3).

Parent-child interactions were coded using The Observer XT (Version 11) software by Noldus (www.noldus.com), a software system that provides online, continuous, computer-assisted behavioral coding of variables. Behaviors were coded by trained independent observers, blind to experimental conditions and the recording time points (pretest baseline versus post intervention/waitlist period). Three independent coders focused on parent behaviors, and another three on child behaviors. They viewed the videotapes separately, in real time, but could pause to replay segments and enter their coding. They were trained on the same 10 videos, covering both experimental conditions (intervention versus waitlist control) and both recording time points (pretest versus posttest). The inter-coder reliability was high, and intraclassRs for the behavioral codes ranged from .72 to .96. The scores were converted into rates per minutes and averaged across 3 independent coders for further data analyses.

Joint attention skills. Kasari et al. (2006) identified joint attention—the sharing of attention with others through pointing, showing, and coordinated looks—as a critical intervention target for children with ASD. Joint attention was coded as an overall score for Phases 1 and 2 (i.e., playing with toys chosen by the child and by the parent, respectively): 0 = *no incidences of joint attention*; 1 = *one or two incidences*; 2 = *three or more incidences* (online Supplement 2 describes Parent’s Joint Attention Skills; Supplement 4 describes Child Joint Attention Skills).

Parental verbal responsiveness. Parents’ verbal responsiveness (McDuffie & Yoder, 2010) was coded to indicate how much they scaffolded children’s language development during parent-child dyadic play. Verbal responsiveness predicts early language learning both for typically-developing children (Bornstein, Tamis-LeMonda, & Haynes, 1999; Hoff & Naigles, 2002; Smith, Adamson, & Bakeman, 1988) and for children with developmental delays other than autism (Brady, Marquis, Fleming, & McLean, 2004; Mahoney, Boyce, Fewell, Spiker, & Wheeden, 1998).

We have simplified McDuffie and Yoder’s (2010) coding for verbal responsiveness into four levels of parental responses to a child’s focus of attention/communication acts: 0 = ignore; 1 = irrelevant; 2 = relevant response; 3 = elaborate response. These are highlighted briefly here; see online Supplement 3 for more details on definitions and examples of the parental verbal responsiveness variables.

Ignore. A score of 0 indicated that a parent missed an opportunity to scaffold a child’s language by ignoring the child’s attempt to communicate or by being unengaged in it.

Irrelevant. A score of 1 meant a parent responded but not in a relevant way.

Young children with developmental disabilities such as ASD generally do not benefit from incidental language input, perhaps because their joint attention skills are weak (Yoder & McDuffie, 2006). Verbal input can be more useful to them when it is related to their current focus of attention (i.e., what they are already looking at, touching, playing with, or talking about). If parents ignore their children’s focus of attention or give irrelevant responses to it, they miss good opportunities to scaffold the children’s language, social, and cognitive development.

Relevant response. A parent immediately repeating a word the child had stumbled over would earn a score of 2 because such a response can help maintain the child's attention and facilitate the child's language comprehension (Sokolov, 1993).

Elaborate response. A parent would get a score of 3 by giving a response that elaborated on the child's action. Some examples: *Follow-in commenting* (language input synchronous with the child's focus of attention and not demanding the child to respond; shown to support child development; Siller & Sigman, 2002). *Follow-in directive* (asking the child to modify what the child was doing; shown to predict spoken vocabulary growth 6 months later for children with ASD; McDuffie & Yoder, 2010). *Linguistic Mapping* (verbally describing a child's nonverbal acts; shown to predict language development in typically developing children as well as children with developmental delays other than autism; Goldin-Meadow, Goodrich, Sauer, & Iverson, 2007; Masur, Flynn, & Eichorst, 2005; Yoder & Warren, 1999, 2001). *Expansion* (enhancing a child's utterance by adding words or grammatical structure so the child can compare his/her own utterance with the more advanced adult rendition; Nelson, 1989; Yoder, Spruytenburg, Edwards, & Davies, 1995).

Parenting Stress Index. Parents completed the Chinese version of the 36-item Parenting Stress Index–Short Form (PSI-SF; Abidin, 1995); higher total scores indicated higher levels of parenting stress. This measure has been validated with Chinese mothers in Hong Kong (Tam, Chan, & Wong, 1994), with excellent internal consistency across items (Cronbach's $\alpha = .93$) comparable to that for a U.S. sample (Abidin, 1990). In the present study, the PSI reliability estimate was also high ($\alpha = .88$).

Child Behavior Checklist (CBCL). The oppositional defiant disorder (ODD) subscale of the CBCL was selected because child behavior problems constitute a major stressor for parents of children with developmental disabilities, and positive parenting strategies are negatively associated with child behavior problems (Achenbach & Rescorla, 2001; Dyches et al., 2012). It was completed by both the primary-caregiver parent and a family member (i.e., spouse/kin) who also took care of the child. The CBCL measures both the frequency and extent to which a child displays various behaviors. The Chinese version adopted here had good internal consistency in prior research (α s = .80 and .83 for the internalizing and externalizing subscales, respectively; Yang, Soong, Chiang, & Chen, 2000) and test-retest reliability ($> .80$ for individual subscales; Leung et al., 2006). In the present study, the Cronbach's α s for the ODD subscale were .79 and .78 respectively for the primary-caregiver parent and a second caregiver. The mean raw total scores on the oppositional defiant disorder subscale were used.

Client Satisfaction. Client satisfaction ratings on the helpfulness of the session, video vignettes, the clinician, group discussions, and role-playing were collected using a 4-point Likert scale, where 1 = *not helpful* and 4 = *very helpful* (Cronbach's $\alpha = .76$).

Homework Compliance. Using a 5-point Likert scale, we collected parents' ratings of how well they understood a strategy, how often they used it, how confident they were in using it, and how effective they thought it was, where 1 = *strongly disagree* and 5 = *strongly agree* (Cronbach's $\alpha = .83$).

Final Satisfaction Questionnaire. Parents' satisfaction with the entire program was assessed. The Consumer Satisfaction Questionnaire (CSQ; Forehand & McMahon, 1981) was adapted to assess parents' perceptions of the group leader's effectiveness, group dynamics, videotape vignettes, and usefulness of content and program method effectiveness. The 40-item questionnaire uses a 7-point scale, ranging from 1 = *very dissatisfied* to 7 = *greatly satisfied*. The scale has been used in prior evaluations of IYPT (e.g., McIntyre 2008a). Our Chinese translation subscales showed good internal consistency: overall program (10 items; $\alpha = 0.83$), teaching format (8 items; $\alpha = 0.82$), specific parenting techniques (12 items; $\alpha = 0.91$), and evaluation of parent group leaders (10 items; $\alpha = 0.95$).

Intervention

The Basic IYPT (updated 2008 version; Webster-Stratton, 2008) was implemented for parents of children aged 3 to 6 years by an experienced clinical psychologist. We also referred to the published IYPT adaptations for children with developmental disabilities program outline (McIntyre, 2008a) and suggestions on tailoring the IYPT Basic according to children's developmental needs and family risk factors (Webster-Stratton, 2007). For highlights of the content and objectives of the IYPT in the present study, see online Supplement 5. Additional modifications were made to accommodate dual-career Hong Kong Chinese families of children with developmental disabilities/delays.

Tailoring the Program for Fast-Paced Dual-Career Chinese families. McIntyre (2008a) evaluated an IYPT program for children with developmental delay. It consisted of 12 weekly sessions (2 hours each) covering developmentally appropriate play, praise, rewards, limit setting, and ways to handle challenging behavior. Given the long working hours in Hong Kong, parents suggested at the pre-assessment that 12 two-hour sessions would be acceptable but perhaps near the upper limit in terms of time commitment. Per the parents' request, we spent more time on coaching techniques (e.g., social and emotion coaching), which the parents might have read about but never actually seen in use. The treatment sessions were conducted in the parents' native language, namely, Cantonese Chinese. Chinese subtitles were added to the IYPT video vignettes for the parents. Handouts and notes written in Chinese were provided. In the first session of the actual randomized trial, we found that Chinese parents had too small an emotion vocabulary for effective emotion coaching of their children, so we added practical examples in the emotion and social coaching handouts to assist role-play and generalization of the techniques. We also found that Chinese parents felt awkward about praising children enthusiastically—especially children lagging behind their peers—so we gave extra coaching and encouragement on the skills and language for praising their children productively. For instance, we encouraged parents to handle their child's developmental disabilities using the growth mindset (Dweck, 2006)—the idea that abilities can be developed through dedication and hard work, and therefore that effort and persistence are praiseworthy.

This mindset motivated parents to support their child's learning by breaking down challenging tasks into smaller parts and praising progress in each part. And the approach proved helpful, with 96% of parents giving ratings of 3 (Helpful) or 4 (Very Helpful) for the session in which it was introduced. All of the parents were satisfied or very satisfied with the facilitator's teaching at the end of that session. In their homework practice, parents were encouraged to practice praising their children for their hard work, persistence, and improvement—as opposed to

perfection—and most of them agreed or strongly agreed with statements that they understood how to use labeled praise (i.e. positively evaluating a specific behavior, activity, or product of the child) effectively to increase their child's good behaviors (96%). They also agreed that after the session they frequently used labeled praise at home (88%); that they felt confident and at ease when using labeled praise with their child (96%); that they believed that praising effectively increased their child's good behaviors (96%). The client satisfaction ratings and homework compliance ratings demonstrated that the Chinese parents in our study appreciated Dweck's (2006) concept of growth mindset and found this approach useful.

For motivation, in each session one parent was given a prize—e.g., a Stress Management CD—in recognition of punctuality, homework compliance, and participation in role-playing. After the posttest interview, in both the pilot study and the randomized controlled trial, parents were also given a packet of coupons for relaxing activities (e.g., a restaurant meal).

Intervention Content and Effective Therapeutic Process for Chinese Parents. The Clinician and group facilitators shared their impressions about the intervention content and which elements could best help Chinese families of children with developmental disabilities in weekly supervision. The Clinician nominated the sessions on praise and reward and controlling upsetting thoughts.

Some of the parents in our study were career women who had been high-achieving and successful throughout their lives. They felt extra shock and disappointment at having to raise a child with developmental disabilities because they had expected just the opposite. The situation was exacerbated at times by the education system in Hong Kong, which often aims to teach children skills beyond their developmental level. Praise, reward and time-out were concepts familiar to these parents, but they had trouble implementing them because of their expectations and attitudes toward their child. The Clinician needed to guide the parents' thinking throughout the whole program and help them apply these techniques through brainstorming, self-reflection exercises, and cognitive reframing. It was crucial for parents to recognize their children's developmental milestones in the areas of pre-academic skills, social skills, and behaviors in order to set realistic and age-appropriate goals for them.

In addition to invoking the concept of the growth mindset, the therapist introduced supplementary materials and ideas. For example, she used a press article, "Why praise can be bad for kids" (Murphy & Allen, 2007), to stimulate and challenge parents' thinking during group discussions. Many parents considered time-outs very harsh and hostile and disapproved of them. But the Clinician was able to alleviate their concerns and anxiety by explaining how time-outs can help children learn to regulate their emotions and calm down for a few minutes following a tantrum, and that enabled the parents to apply the technique flexibly and productively.

The intervention team felt that the homework assignments should be tailored especially to fit each unique parent/child situation. For example, the team made individualized reward and routine charts and wrote individualized role-play scripts in developmentally appropriate language. This made homework assignments clear and concrete and engaged each parent in a definite social contract with the intervention team for the week.

Treatment Integrity. The program was conducted by a Chinese-English bilingual clinical psychologist with 5 years of clinical experience at the start of the study. The Clinician reviewed the self-study guide and videotapes to acquire parent group leadership skills and completed the Incredible Years basic parent group leader training for program delivery. Two group facilitators with university-level education in psychology, supervised weekly by the clinical psychologist, assisted in role-play enactment, video-recording group sessions, and note-taking during group discussions.

All the intervention sessions were videotaped and received reviews and fidelity checks by the IY National Office in the U.S. as well as weekly self-evaluations by the group leader and peer evaluations by the group facilitators. The Clinician had as-needed consultations with professors of clinical psychology and developmental psychology at the University of Hong Kong during the study and met with the IYPT developer after the study to audit session videotapes and fidelity checklists. The IYPT manual (updated and revised by Webster-Stratton in 2008; Webster-Stratton, 2008) was closely followed, standardized materials and translated handouts for all parents were provided, weekly session checklists for all delivered sessions were completed for monitoring protocol adherence, and peer- and self-evaluation questionnaires were reviewed. The intervention fidelity check revealed that 100% of the planned intervention components had been implemented as intended in all the group sessions.

Results

Acceptability of the Incredible Years Parent Training

To assess the acceptability of the IYPT for the Hong Kong Chinese population, we collected parent feedback during weekly sessions, consumer satisfaction data following the last parent training session, and parent attendance data. Parents evaluated the content, videotape vignettes, teaching, and group discussion each week using a four-point scale, ranging from 1 = *not helpful* to 4 = *very helpful*.

Of the 19 mothers and 6 fathers assigned to the intervention group, 15 mothers (79%) and 3 fathers (50%) completed more than 80% of the 12 intervention sessions. All 25 of the parents in the intervention group completed the post-intervention assessments. On average, mothers attended 8.2 sessions, and fathers attended 9.4 sessions. No participant dropped out from the parenting program. In their weekly feedback, vast majorities of the parents (ranging from 76% to 100% of the attendees) gave separate Helpful or Very Helpful ratings (i.e., 3 or 4 on a 4-point scale) to the content, vignettes, facilitator, discussion and role-play in each of the 12 sessions. Similarly a large majority (ranging from 80% to 100%) gave Agree or Very Much Agree ratings (i.e., 4 or 5 on a 5-point scale) to statements that they understood the homework strategy, frequently applied it, felt confident about it, and found it effective.

Following the last intervention session, parents completed a Consumer Satisfaction Questionnaire using a 7-point scale, ranging from 1 = *very dissatisfied* to 7 = *greatly satisfied*. The mean ratings were: overall program 5.98 ($SD = 0.16$, range = 5.76-6.24); teaching format = 5.99 ($SD = 0.34$, range = 5.21-6.24); specific parenting techniques = 6.00 ($SD = 0.23$, range =

5.37-6.32); evaluation of parent group leaders = 6.15 ($SD = 0.12$, range = 5.95-6.32). The average score across all 40 items was 6.03 ($SD = 0.22$, range = 5.21-6.32), indicating general satisfaction.

Preliminary Analyses

Parents randomly assigned to the intervention condition versus waitlist control did not differ on various demographic variables except for parental education level ($X^2(1, N=46) = 7.05$, $p = .008$), which was then included as a covariate in subsequent analyses on intervention effects. Importantly, self-reported parenting stress levels (primary-caregiver; spouse/kin as the other caregiver in the family) and parent-child relationships did not differ significantly at baseline assessment ($F(1,45) = .29$, $p > .5$; $F(1,43) = 3.42$, $p > .07$; $F(1,43) = .06$, $p > .8$, respectively).

Intervention Effects

To assess intervention effects, analyses of covariance (ANCOVA) were conducted on all outcome measures with Bonferroni adjustment for multiple comparisons ($\alpha = 0.05$). The main independent variable was experimental group status, and the dependent variables were post-intervention/waitlist period (posttest) scores, with corresponding pretest scores and parental educational level as covariates. About 5.6% of the data were missing and were estimated using SPSS multiple imputation with five imputations (Rubin, 1987). To estimate the magnitude of intervention effect, effect sizes (Cohen's d) were calculated, where $d = 0.3$ denotes a small but effective change, 0.5 denotes a medium effect size, and 0.8 and above denotes a large effect size.

Observed Changes in Parent-child Interaction. Frequencies of the six parent behaviors during parent-child interactions were measured for the three play situations (i.e., play with toys chosen by the child, play with toys chosen by the parent, and clean-up) and converted into rates per minute. Specifically, parents in the intervention group increased their labeled praises specific to child behavior ($F(1, 42) = 15.10$, $p < .001$, $\eta_p^2 = .26$, $d = 1.41$), and unlabeled non-specific praises ($F(1, 42) = 4.95$, $p = .03$, $\eta_p^2 = .11$, $d = .58$) more than parents in the waitlist control. They also made fewer low-level verbal responses (i.e., they ignored or made irrelevant responses less often) in their conversations with their child ($F(1, 42) = 4.18$, $p = .047$, $\eta_p^2 = .09$, $d = .47$). Moreover, children of parents in the intervention condition were more likely to reciprocate their parents' initiation of joint attention ($F(1, 42) = 9.46$, $p = .004$, $\eta_p^2 = .184$, $d = 1.17$) than those in the waitlist control. The covariate parental education did not significantly contribute to any of the experimental condition effects for parent-child interaction: parents' increase in labeled praises ($F(1, 42) = 0.22$, $p = .64$, $\eta_p^2 = .005$) and unlabeled non-specific praises ($F(1, 42) = .193$, $p = .663$, $\eta_p^2 = .005$), parents' decrease in low-level verbal responses ($F(1, 42) = .024$, $p = .877$, $\eta_p^2 = .001$), and children's increase in responsive joint attention ($F(1, 42) = .017$, $p = .898$, $\eta_p^2 < .001$).

Taken together, reliable and measurable benefits of the IYPT in parent-child interactions, with medium to large effect size, can be detected by unbiased observers via video-coding. Compared to waitlist-control parent-child dyads, parents who had participated in the IYPT program displayed more behaviors that supported child learning and better parent-child

relationships, and their children became more responsive (i.e., more successful in responding to parents' joint attention bids) in their parent-child interactions (Table 3).

Reduced Parenting Stress. An ANCOVA with parenting stress at posttest as the dependent measure (with pretest parenting stress and parental educational level as covariates) revealed a significant experimental condition effect, documenting intervention benefits with a small effect size in reducing parenting stress after 12 sessions of the IYPT program ($F(1, 41) = 6.25, p = .017, \eta_p^2 = .132, d = .38$; Table 4). The covariate parental education did not significantly contribute to the parents' decreased stress ($F(1, 41) = .104, p = .749, \eta_p^2 = .003$).

Child Behaviors. An ANCOVA with child oppositional behaviors reported by the primary-caregiver parents (using the CBCL) at posttest as the dependent measure (with the corresponding pretest measure and parental education as covariates) revealed a significant group difference with a medium effect size, documenting a significant decrease in oppositional behaviors for children of parents in the intervention group, compared with the waitlist control ($F(1, 42) = 5.947, p = .019, \eta_p^2 = .124, d = .51$; Table 4). Furthermore, an analogous ANCOVA on the primary caregivers' spouse/kin-reports revealed, with a medium to large effect size, that this intervention benefit could also be detected by another caregiver in the family ($F(1, 42) = 11.23, p = .002, \eta_p^2 = .211, d = .73$; Table 4). The covariate parental education did not significantly contribute to the decrease in child problem behaviors reported with CBCL by the primary caregivers ($F(1, 42) = 1.395, p = .244, \eta_p^2 = .032$), but it did for the spouse/kin reports ($F(1, 42) = 9.937, p = .003, \eta_p^2 = .191$).

Discussion

This is the first randomized controlled trial study in an Asian society to evaluate the acceptability and effectiveness of The Incredible Years Basic Pre-school Parent Program (Webster-Stratton & Reid, 2010), which has received a considerable amount of rigorous empirical support in Western societies. Specifically, this study focused on Chinese parents of 3- to 6-year-olds with developmental disabilities in Hong Kong and tested if and how well this program could reduce parental stress and improve the kind of parent-child interaction that would support child development. The results—based on behavioral observations, self-reports, and other-reports—converged to indicate significant intervention benefits in reducing parenting stress and child behavior problems, increasing supportive parenting practices, and improving parent-child interaction. Together, these results suggest that the IYPT program, with some cultural tailoring, is relevant and effective for Hong Kong Chinese parents of young children with developmental disabilities.

The Incredible Years Parenting Program was effective both in reducing stress for Chinese parents and in reducing child behavior problems.

Our study was the first to document that, with modest cultural tailoring, the Incredible Years Basic Parent Program can help reduce parenting stress—a major problem for Chinese parents with preschoolers at risk for developmental disabilities. Compared to the waitlist control

group, parents in the intervention group reported significantly lower parental stress after completing the program. These results are consistent with previous research conducted with ethnically diverse families in the U.S. (e.g., Azevedo et al., 2013; Kim, Cain, & Webster-Stratton, 2008), although not with Lau, Fung, Ho, Liu & Gudiño's (2011) pilot study on Chinese-American families.

Because the program was administered in a group format, we are mindful that social support and peer learning may have accounted for some of the observed benefits. Further research using a general parent support group as a placebo control group or even the Triple-P as a treatment-as-usual control would be informative. Perhaps, on the other hand, the group format should actually be seen as a strength rather than a potential design confound of the program since it can reduce participant isolation, enhance support networks, and even alleviate some of the affiliate stigma (Mak & Cheung, 2008) that Chinese parents of children with developmental disabilities often experience.

Another likely reason for the decrease in parenting stress could be the parents' perceived decrease of child misbehavior. No analogous improvement was reported in the waitlist-control group, hence offering an independent replication of treatment effects for Hong Kong Chinese families. The effect size ranging from medium to large ($d = .51$ for primary caregiver, and $d = .73$ for spouse/kin reports) is larger than the small effect previously reported in a meta-analysis (mean effect size of $d = .27$; Menting et al., 2013).

As noted earlier, child behavior problems constitute a major stressor for parents of children with developmental disabilities (Dyches et al., 2012), and reducing these problems can, in turn, reduce parents' stress. This may be especially true for Chinese parents who are influenced by traditional Confucian principles that often call for high-power coercive strategies to teach and discipline children (Chao, 1994; Chen et al., 1998). An illustration: our video data transcripts (online Supplement 6) showed that parents who had received the intervention learned to use labeled praises to shape their child's behaviors, instead of using criticisms and intrusive demands to correct misbehaviors. The video transcripts also showed that parents who had the intervention used a richer vocabulary to praise their child's play skills, their memory capacity and skills, and their behaviors (e.g., sitting still, being focused).

Other possible reasons why the program helped decrease parenting stress: using Dweck's growth mindset to help parents cognitively reframe their child's behaviors; giving door prizes chosen to reduce parental stress (e.g., Stress Management CD), which could increase parents' awareness of their stress levels and self-care.

Parents giving more praise and less irrelevant verbalization; children responding more to parental joint-attention bids.

After the intervention, parents offered more labeled praises and wasted less time on irrelevant talk. Parent-child dialogues became more positive, child-centred and sensitive to the child's needs. The parents' new approach was reinforced when their children responded to their joint-attention bids, making the joint-play more reciprocal and enjoyable. For example (online Supplement 6), video transcripts showed that before the intervention, parent-child joint attention rarely happened—mainly because the child seldom shifted his attention to look at his parent and

was in general quite unresponsive when the parent tried to direct his focus. After the intervention, the child became more responsive (e.g., pointing at a toy and making some sounds in reply to the parent's joint-attention bid). The improvement in joint attention suggests that even though children with developmental concerns did not receive any direct intervention, they nonetheless benefited from their parents' participation in the intervention.

Strengths of the Study

This is the first report to document the cultural adaptation of the Incredible Years Basic Parent Program to a Chinese audience. As mentioned, we spent extra time on techniques that are culturally foreign for Chinese parents (coaching, praising; cf. Mbise & Kysela, 1990)—techniques some parents had read about but never seen actually used in the Chinese context. The Clinician and group facilitators felt that Chinese parents needed substantial support in role-play enactments and home assignments completion. Some practical strategies to assist these parents include brainstorming possible words to use during the role-plays and assisting parents to prepare scripted role-play to use in class and to practice at home. This preparation work assisted parents to coach their child in a language that is developmentally-appropriate. It also maximized parents' confidence to participate in role-play in the program sessions and increased their ability to apply the parenting skills at home. Personalizing home exercises also made application of skills more concrete and served as a weekly social contract to enhance parents' commitment for homework completion and participation in group discussion. .

Blinded observations of parent-child interactions during a structured play activity revealed significant real-time improvements in child joint attention and parents' verbal responsiveness that were not captured in parents' self-reports. Eyberg and Robinson (1981) stated that direct observations of parent-child interaction are probably much more sensitive for detecting behavioral change than self-report questionnaires and perhaps also represent a more ecologically valid assessment of parent-child interaction and relationships. This view was further supported by Menting et al.'s (2013) meta-analysis showing that the mean effect size, as measured by Cohen's *d*, for reduction in disruptive behaviors based on observations was .37—somewhat larger than the mean effect sizes of .30 based on parents' self-reports.

Two other studies have reported behavioral changes for parents of children with special needs following the IYPT. Azevedo et al. (2013) reported improvements in positive parenting (a composite of labeled and unlabeled praise, positive affect, physically positive behavior and problem-solving) after a 14-week intervention for parents of preschoolers with ADHD. McIntyre (2008a) found that the IYPT intervention reduced parents' inappropriate commands.

Our study offers promising evidence that The Incredible Years Basic Parent Training can enhance socioemotional development for children with developmental concerns beyond Western cultures. It can help children achieve joint attention more successfully with their caregivers, reflecting better social awareness and motivation for social interaction, which in turn can support socioemotional development and encourage parents to have further positive interactions. No effects were observed in children's ability to initiate joint attention, perhaps should be expected based on prior research showing how challenging it is to improve this ability in young children who have social understanding deficits (Hwang & Hughes, 2000; Kasari, 2002). To achieve

sustainable gain would probably require a longer program or longer sessions—giving parents more time to role-play coaching techniques (particularly on verbal elaboration).

In the current study, we combined parent and child behaviors and their dialogues across three situations (child-directed play, parent-directed play, and clean up) to get more reliable measures. Whether these parents could flexibly apply various strategies acquired in the IYPT in each of these situations, and other situations as well, remains to be explored in future research with richer assessments and larger samples for more statistical power.

Limitations and Recommendations

This study has several limitations. First, the modest sample size ($N = 52$) limited its statistical power to detect small effects. Follow-up research with a larger sample size, preferably conducted by another research team to yield an independent replication, could increase statistical power and allow more detailed analysis on intervention benefits for parents of children with different diagnoses (e.g., children with ASD, children with ADHD, and children with comorbid diagnoses).

Second, self-selection bias might decrease the generalizability of these findings. Highly motivated parents willing to spend a good deal of time and effort might have self-selected to join this study, so the findings might not generalize well to less motivated parents. Third, only immediate posttest measures were taken, it remains for future research to explore the sustainability of the intervention effects. Fourth, this study only had one group in each condition. Future studies should include multiple groups in each condition, preferably conducted by different group leaders and co-leaders for better generalization of the findings. Finally, as this study was an exploratory study, the current intervention received reviews and fidelity checks by the I.Y. National Office after the study. Future studies would benefit from consultations prior to the start of the study.

Clinical Implications

Children and adults with intellectual and other developmental disabilities are seven times more likely to be diagnosed with a severe behavior disorder or mental health diagnosis than their typically developing peers (Brown, McIntyre, Crnic, Baker, & Blacher, 2011). This dual diagnosis of cognitive and behavioral impairments places a good deal of strain on parents and teachers (McIntyre et al., 2006), and it is of serious concern to healthcare-providers.

The present findings suggest that The Incredible Years Program can be effective for such client groups, not only in Western cultures in which the program was developed, but also in an Asian society that highly values academic and other achievements and inadvertently puts families of children with developmental disabilities/delays under tremendous stress.

Early identification of high-risk families is crucial for effective prevention and intervention success. Children's improvements in behaviors and social skills as a result of this kind of parent coaching intervention may well translate into long-term mental health and social functioning benefits for the children, including better school attainments and fewer problem behaviors. It is of considerable clinical significance to continue this line of research to maximize our ability to

help parents best facilitate language and socioemotional development in young children with developmental disabilities (National Scientific Council on the Developing Child (2007a, b).

Simply put, this is the first study conducted in a major Asian city, namely Hong Kong, to systematically evaluate the effectiveness of the Incredible Years Basic Parent Training (IYPT Basic) for Chinese parents of preschoolers with developmental disabilities/delays. This study focused on an evidence-based and well-researched intervention model. The intervention emphasized collaboration and the development of positive parenting strategies to help parents learn to be positive role-models for their children and to promote children's self-regulatory skills (e.g., using slow-breathing techniques during time-outs to help children calm down). The low dropout rate and high attendance and levels of satisfaction together endorse the acceptability of the Incredible Years model in an Asian community. This was a randomized controlled trial (RCT) study adopting a multi-method (e.g., questionnaires, interview, and behavioral observation) and multi-informant (e.g., parents, spouses, and child) comprehensive approach, all of which gives credence to the validity and reliability of its promising findings.

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Tables:

Table 1. *Diagnoses of Children*

Table 2. *Demographic Characteristics of Treatment and Waitlist-Control Participants (N =47, with 25 participants in treatment group and 22 participants in control group)*

Table 3. *Changes in Observed Behaviors from Pre- to Post-test in Parent-child Interaction for the Intervention versus Waitlist-Control Group*

Table 4. *Changes in Primary-Caregiver (PC) Parent Reports and Their Spouse/Kin Reports from Pre- to Post-test for the Intervention versus Waitlist-Control Group*

Figure:

Figure 1. Flowchart of the Research Design

Online Supplementary Materials: <https://figshare.com/s/58ec8e4a35f60bcb9676>

Supplement 1: *Definitions of Parent-child Behavior Codes*

Supplement 2: *Definitions of Parent's Joint Attention Skills*

Supplement 3: *Definitions and Examples of the Parent's Verbal Responsiveness Variables*

Supplement 4: *Definitions of Child's Joint Attention Skills*

Supplement 5: *Highlights of Content and Objectives of the IYPT in the Present Study*

Supplement 6: *Sample Video Data Transcripts*

Table 1: Diagnoses of Children

Diagnosis Categories	Number of Children (Percentage)	
	Treatment (<i>n</i> = 25)	Waitlist (<i>n</i> = 22)
Autism Spectrum Disorder	7 (28%)	7 (32%)
Developmental Delay (speech, social, cognitive and/or physical)	6 (24%)	7 (32%)
Attention-Deficit Hyperactivity Disorder	0 (0%)	1 (4%)
Autism Spectrum Disorder with comorbidity	2 (8%)	3 (14%)
Developmental Delay with comorbidity	8 (32%)	3 (14%)
Attention-Deficit Hyperactivity Disorder with comorbidity	2 (8%)	1 (4%)

Note. Children's diagnoses have been grouped according to DSM-V (American Psychiatric Association, 2013)

Table 2: Demographics Characteristics of Treatment and Waitlist-Control Participants (N =47, with 25 participants in treatment group and 22 participants in control group)

Characteristics of Parent		Number (Percentage)		F	p
		Treatment (n = 25)	Waitlist (n = 22)		
Gender	Male	6 (24%)	1 (5%)	3.61	.064
	Female	19 (76%)	21 (95%)		
Age mean (SD)		38.38 (3.87)	37.39 (3.01)	.78	.383
Marital status	Married	23 (92%)	19 (86%)	.38	.542
	Divorced	2 (8%)	3 (14%)		
Employment status	Employed	15 (60%)	14 (64%)	.001	.980
	Unemployed	10 (40%)	8 (36%)		
Education level	Tertiary education	18 (72%)	12 (55%)	7.97**	.007
	Secondary education	6 (24%)	10 (45%)		
Source of fund	Received government subsidy	12 (48%)	13 (59%)	1.05	.312
	Private fund	13 (52%)	9 (41%)		
Characteristics of Children					
Gender	Male	19 (76%)	16 (72%)	.06	.803
	Female	6 (24%)	6 (27%)		
Age mean at time 1 (SD)		55.92 (10.88)	56.52 (11.00)	.04	.850
Age mean at intervention (SD)		56.52 (11.10)	60.63 (10.67)	1.67	.203

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3: Changes in Observed Behavior from Pre- to Post-test in Parent-Child Interaction for the Intervention versus Waitlist-Control Group

		Treatment <i>M (SD)</i>	Waitlist <i>M (SD)</i>	<i>F</i>	η_p^2	<i>p</i>
Parent Categories						
Negative talk (NTA)	Pre	0.44 (0.50)	0.27 (0.21)	1.24	.03	.272
	Post	0.21 (0.20)	0.30 (0.29)			
Direct Command (DC)	Pre	0.91 (0.51)	1.10 (0.63)	1.14	.03	.292
	Post	0.73 (0.44)	1.04 (0.70)			
Indirect Command (IC)	Pre	0.79 (0.58)	0.64 (0.39)	3.49	.08	.069
	Post	0.88 (0.46)	0.58 (0.51)			
Labeled Praise (LP)	Pre	0.02 (0.04)	0.06 (0.18)	15.10***	.26	<.001
	Post	0.19 (0.16)	0.05 (0.08)			
Unlabeled Praise (UP)	Pre	0.21 (0.30)	0.17 (0.21)	4.95*	.11	.032
	Post	0.39 (0.36)	0.21 (0.23)			
Low Verbal responsiveness (VR0)	Pre	0.08 (0.08)	0.15 (0.17)	4.18*	.09	.047
	Post	0.06 (0.09)	0.20 (0.22)			
Initiating Joint Attention (PJI)	Pre	1.74 (0.27)	1.67 (0.32)	3.42	.08	.071
	Post	1.68 (0.32)	1.56 (0.34)			
Child Categories						
Affect	Pre	1.32 (0.36)	1.47 (0.41)	2.17	.05	.148
	Post	1.50 (0.31)	1.43 (0.38)			
Responding to joint attention_bid (CJR)	Pre	1.44 (0.37)	1.61 (0.30)	9.46*	.18	.004
	Post	1.60 (0.32)	1.38 (0.31)			

Compliance (CO)	Pre	0.84 (0.53)	0.86 (0.51)	1.00	.02	.332
	Post	0.80 (0.55)	0.97 (0.69)			
Non-compliance (NC)	Pre	0.28 (0.29)	0.28 (0.25)	.32	.01	.571
	Post	0.32 (0.33)	0.34 (0.28)			

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4: Changes in Primary-Caregiver (PC) Parent Reports and Their Spouse/Kin Reports from Pre- to Post-test for the Intervention versus Waitlist-Control Group

Checklist Measure (Reporter)		Treatment <i>M (SD)</i>	Waitlist <i>M (SD)</i>	<i>F</i>	η_p^2	<i>p</i>
PSI-SF (PC Parent)	Pre	103.64 (20.73)	106.73 (18.29)	6.25*	.13	.017
	Post	94.91 (13.78)	104.47 (13.36)			
CBCL- Oppositional (PC-Parent)	Pre	4.24 (2.55)	5.51 (1.89)	5.95*	.12	.019
	Post	3.43 (1.28)	5.84 (2.87)			
CBCL- oppositional (Spouse/Kin)	Pre	4.26 (2.43)	5.55 (2.83)	11.23**	.21	.002
	Post	2.55 (1.78)	5.57 (2.34)			

Note. * $p < .05$, ** $p < .01$.

Figure

Figure 1. *Flowchart of the Research Design*

