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Broadening the reach of evidence-based parenting interventions: Evaluation of a brief online version of the Triple P – Positive Parenting Program

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Abstract

Every year 14% of children in Australia develop serious emotional or behaviour problems that can have detrimental long-term effects for the children themselves, for their families and for society. Behavioural family interventions are effective in the prevention and treatment of these problems, but have not yet had large-scale societal impact because only a small proportion of families actually receive evidence-based interventions. To address this problem, parenting programs need to be made available at different levels of intensity, across a variety of settings and in a variety of formats. One increasingly accessed forum for parents is the Internet, however, little is known about the potential of web-based programs to strengthen parenting. This thesis argues that one way to improve parents' access to parenting programs is by offering a low-intensity, self-directed online parenting program. To date no such intervention has been evaluated for parents of children with behaviour problems.

This series of research is comprised of three empirical studies: 1) a consumer survey seeking to establish the feasibility of online parenting support for a broad range of parents; 2) a randomised controlled trial testing the efficacy of a brief online parenting program (Triple P Online Brief [TPOL Brief]) in reducing dysfunctional parenting and child behaviour problems; and 3) an investigation of the predictors of use and outcomes of TPOL Brief.

Chapter 1 reviews the relevant literature and provides a rationale for the current research series. The role of parenting interventions in the prevention and treatment of child behaviour problems is examined and their current limitations are discussed. Evidence for the efficacy of various intervention formats is reviewed, and brief, low-intensity online parenting programs as part of a public health approach are proposed as a way of broadening the reach of parenting interventions. The chapter highlights challenges and unanswered questions regarding online parenting support and describes the study aims.

Chapter 2 presents data from a cross-sectional survey of 459 Australian parents of 2-12 year old children. The survey examined 1) parents' access to and use of the Internet, 2) parents' use of different sources of parenting information, especially online sources, and 3) preferred delivery modalities for receiving information about parenting. In order to investigate if online parenting support favours well-educated, middle class families or is suitable for a broad range of parents, the study examined the extent to which use of web-based parenting information and perceived usefulness ratings of online programs could be predicted by a range of variables, in particular families' socio-demographic characteristics. Results indicate that the majority of parents use parenting websites (65%) and social media (45%) for parenting information and that providing

parenting support online may be a viable way to reach a broad range of families, even those typically less likely to access other forms of parenting support.

Chapter 3 details a randomised controlled trial demonstrating the efficacy of TPOL Brief for families with early onset conduct problems, compared to an Internet-use-as-usual control group. Two hundred families with 2-9 year old children participated and were assessed prior to commencement of the intervention, at 8-weeks post intervention commencement and at 9-month follow-up. Families of the intervention group reported high parent satisfaction, and significantly improved parental confidence, lower use of ineffective parenting strategies and improved child behaviour, with small to medium effect sizes.

Chapter 4 investigates a range of family and program-related factors as potential predictors of the improvements in child behaviour and parenting practices reported in the RCT. Greater improvement in parenting style was predicted by higher pre-intervention levels of ineffective parenting. Higher baseline levels of child behaviour problems, older parental age and more intense conflict over parenting pre-intervention were associated with greater improvement in child behaviour. Family demographics (e.g., parent education, employment), parental adjustment (e.g., parental stress, anger) and program related factors (e.g., number of completed modules) were not significant predictors of treatment outcomes, indicating that TPOL Brief is efficacious for a broad range of users.

The final chapter integrates the research findings and examines their contribution to the wider literature. Implications are discussed and suggestions made for future research.

Overall, this research adds to the knowledge base about use of the Internet to more effectively reach, engage and assist a broad range of families with evidence-based parenting support. It confirms the feasibility of online parenting support and provides preliminary evidence that a brief web-based intervention is in line with consumer preferences and can bring about significant improvements in parenting and child behaviour, particularly for families with higher pre-intervention levels of problems. Findings support the inclusion of low-intensity online interventions in a public health approach to parenting support with the aim of increasing the accessibility and reach of parenting programs, and thereby influencing the population prevalence of child behaviour problems.

Declaration by author

This thesis is composed of my original work, and contains no material previously published or written by another person except where due reference has been made in the text. I have clearly stated the contribution by others to jointly-authored works that I have included in my thesis.

I have clearly stated the contribution of others to my thesis as a whole, including statistical assistance, survey design, data analysis, significant technical procedures, professional editorial advice, and any other original research work used or reported in my thesis. The content of my thesis is the result of work I have carried out since the commencement of my research higher degree candidature and does not include a substantial part of work that has been submitted to qualify for the award of any other degree or diploma in any university or other tertiary institution. I have clearly stated which parts of my thesis, if any, have been submitted to qualify for another award.

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Contributions by others to the thesis

My supervisors, Professor Matthew R. Sanders, Associate Professor Alina Morawska and Dr Karen Turner contributed to the conception and design of the research series, and provided critical feedback on written work.

Dr Julie Rusby coordinated the coding of behaviour observations at the Oregon Research Institute, Eugene, OR, USA.

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Keywords

parenting, child emotional and behavioural problems, evidence-based parenting program, behavioural family intervention, Triple P, web-based intervention, brief intervention, randomised controlled trial, public health

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TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

LIST OF ABBREVIATIONS

ABS: Australian Bureau of Statistics

ADHD: Attention Deficit Hyperactivity Disorder

BFI: Behavioural Family Intervention

CAPES: Child Adjustment and Parent Efficacy Scale

CD: Conduct Disorder

CONSORT: Consolidated Standards of Reporting Trials

CSQ: Client Satisfaction Questionnaire

DASS-21: Depression, Anxiety, Stress Scales-21

DBD: Disruptive Behaviour Disorders

ECBI: Eyberg Child Behaviour Inventory

FBQ: Family Background Questionnaire

IUAU: Internet-use-as-usual control group

MI: Multiple Imputation

ODD: Oppositional Defiant Disorder

PAI: Parental Anger Inventory

PCPTOS: Parent–Child Play Task Observation System

PPC: Parent Problem Checklist

PS: Parenting Scale

RCI: Reliable Change Index

RCT: Randomised controlled trial

SDQ: Strengths and Difficulties Questionnaire

SES: Socio-economic status

SPSS: Statistical Package for the Social Sciences

Triple P: Positive Parenting Program

TPOL: Triple P Online

TPOL Brief: Triple P Online Brief

CHAPTER 1:
INTRODUCTION

The quality of parenting a child receives is one of the most fundamental influences on their development, mental health and wellbeing. Lack of a positive relationship with their parents and being exposed to dysfunctional, inconsistent parenting styles can have profound effects on a child's future (Duncombe, Havighurst, Holland, & Frankling, 2012; Scott, 2012). This thesis aspires to contribute to the goal of supporting parents in the most important job there is – raising the next generation. It aims to investigate the suitability and efficacy of providing parenting support in a convenient and practical way, in the form of a brief online parenting program.

The first chapter of this thesis provides an overview of relevant background and explains the rationale for undertaking the research. It begins by outlining the importance of addressing child behaviour problems in young children and the role parents play in the development, but also the alleviation, of such problems. It describes the role of parenting interventions and their current limitations and makes a case for why a public health approach to parenting is needed. A brief overview of the Triple P – Positive Parenting Program (Triple P) as an example of a sophisticated model of population-based parenting support is presented. The chapter then briefly summarises the literature supporting the use of brief, self-administered and technology-assisted interventions to broaden the reach of parenting interventions. This is followed by an introduction to the recently developed Triple P Online Brief program (TPOL Brief), a low intensity online parenting program used in a randomised controlled trial that forms the centrepiece of this thesis. The chapter then discusses some of the challenges associated with online parenting interventions. Specifically, the lack of available research regarding moderators of positive outcomes in online parenting interventions is discussed, along with the limited knowledge of consumer preferences. Finally, the study aims and research questions are presented. The chapter ends with an outline of the remaining chapters.

The Importance of Addressing Conduct Problems in Young Children

Mental disorders are some of the most common chronic health problems affecting children and adolescents. In Australia, the twelve-month prevalence rate for anxiety disorders, major depressive disorder, ADHD and conduct disorder is 13.9% among 4- to 17-year-olds (Lawrence et al., 2015). The second most frequent condition in children worldwide (only surpassed by anxiety disorders) (Merikangas, Nakamura, & Kessler, 2009), and the most common reason for children to be referred to mental health services, are Disruptive Behaviour Disorders (DBD) (NICE, 2013). DBD, including Conduct Disorder (CD) and Oppositional Defiant Disorder (ODD) are a group of disorders that are marked by behaviours like non-compliance, temper tantrums, defiance and aggressiveness. Prevalence rates have been estimated as 2.1% for CD and 3.6% for ODD

(Polanczyk, Salum, Sugaya, Caye, & Rohde, 2015). Estimates for behaviours that are problematic but do not meet diagnostic criteria are even higher (Kessler et al., 2005). For example, a review by Kalb and Loeber (2003) concluded that 25% to 65% of parents of non-referred children considered their children to be at least somewhat noncompliant, with 1% to 9% of parents rating noncompliance as a frequent or severe problem.

Children with disruptive behaviour or early onset conduct problems are at significantly elevated risk for a range of difficulties throughout childhood, adolescence and adulthood. These include poor academic achievement (Brennan, Shaw, Dishion, & Wilson, 2012), peer relationship difficulties (Kouros, Cummings, & Davies, 2010) and antisocial behaviour (Trentacosta & Shaw, 2009), as well as teenage pregnancy, criminal behaviour, drug abuse, unemployment, and mental health problems (Kosterman et al., 2009; van der Molen et al., 2015). Because short- and longer-term consequences for the children themselves, their families and society can be severe, early intervention and even better, prevention, is necessary (Costello, Egger, & Angold, 2005). If these problems are not addressed when children are young, they are much more likely to become chronic disorders in adolescence and adulthood, and are much less likely to respond to intervention (Webster-Stratton & Reid, 2016).

The Role of Parenting Practices in the Development of Conduct Problems

The aetiology of disruptive behaviour and conduct problems is complex, with temperament, hormonal, genetic and environmental factors likely playing a role (e.g., Burke, Loeber, & Birmaher, 2002; Scott, 2012). One of the strongest environmental influences on a child's development is the family environment and the type of parenting they receive (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). Starting in toddlerhood, many children display problematic behaviour, which can be considered a normative part of their development as they test their emerging autonomy. However, children's long-term developmental outcomes are influenced by the extent to which their parents successfully manage their challenging behaviour (Shaw, Owens, Giovannelli, & Winslow, 2001). A number of parenting and family factors have been linked with the development of mental health issues and problems in children, including the lack of a warm, positive relationship with parents, lack of positive involvement and guidance, inflexible, inconsistent or overly harsh discipline, inadequate supervision and limit setting, and negative parental emotional expressiveness (e.g., Campbell, 1997; Duncombe et al., 2012; Stormshak, Bierman, McMahon, & Lengua, 2000). Other aspects related to the development of serious problem behaviour in children are socioeconomic disadvantage, parental mental health problems, criminal history, substance abuse and marital problems (e.g., Barry, Dunlap, Cotten, Lochman, & Wells, 2005; Malik et al., 2007; Webster-Stratton, 1990). These factors can have a direct effect on child behaviour or indirectly influence it by affecting parenting practices. Rather than one risk factor

operating in isolation, it appears that the accumulation of factors may be critical to the onset of conduct problems, however, not much is known about how risk factors aggregate (Burke et al., 2002). Given that not all children who exhibit behaviour problems in early childhood have persistent behaviour and conduct problems later on, it is also important to consider protective factors, which may present a target for interventions. Some protective factors that have been identified are parenting that is high in warmth, acceptance, responsiveness, and anticipating a child's needs (e.g., Davidov & Grusec, 2006; Gardner, Shaw, Dishion, Burton, & Supplee, 2007), attachment security in infancy (Cyr, Pasalich, McMahon, & Spieker, 2014), as well as high maternal social support and high neighbourhood quality (Vanderbilt-Adriance et al., 2015).

Affecting Change in Parenting

While in the past parenting has often been seen as something that should come natural and is best learned 'on the job', it is now generally accepted that offering support and training to parents is greatly beneficial, if not essential. The fundamental belief that underlies all parenting programs is that parental knowledge, attitudes and practices can be altered and parenting skills can be learned. To date we know that a number of parenting programs with different content, delivery settings and delivery techniques have positive effects. However, we know much less about how they work, and the critical ingredients of parenting programs are not yet wholly understood. Research investigating mechanisms of change is still in its infancy, and the factors that contribute to an intervention being effective may differ between different types of programs. The majority of interventions are understood to produce positive changes through teaching parents key parenting skills and enhancing parental confidence (e.g., Furlong & McGilloway, 2012). A meta-analysis by Kaminski, Valle, Filene, and Boyle (2008) summarised a number of factors that may act as essential intervention components: providing strategies that help increase positive parent-child interactions and emotional communication skills, teaching parents the appropriate use of consequences such as time-out, educating parents about the importance of parenting consistency, teaching problem-solving skills and increasing parental sensitivity and nurturing, modelling positive behaviour and providing opportunity for parents to practice strategies in sessions via role-play, and requiring parents to practice new skills with their children.

Similar findings emerged from an examination of the process of change in a qualitative study with parents that completed an evidence-based parenting intervention (Holtrop, Parra-Cardona, & Forgatch, 2014). Results showed that parents' efforts to attempt, appraise, and apply the intervention material contributed to changes in their parenting practices. Parents' actively and intentionally evaluated the effectiveness of each strategy within their own contexts, and adapted skills to better match their families. They discontinued the use of certain strategies over time once

desired changes have become established. Parents also reported that role plays, home practice assignments, trouble- shooting, and visual aids were crucial to helping them learn.

The Value of Parenting Interventions in Improving Parenting Practices

Positive parenting programs are widely recognised as one of the most effective ways of preventing and treating child behaviour problems. A systematic review and meta-analysis by Epstein, Fonnesbeck, Potter, Rizzone, and McPheeters (2015) on the comparative effectiveness of psychosocial interventions for children and adolescents with disruptive behaviour problems suggests that interventions that include a parent component, either alone or in combination with other intervention components, are likely to have the largest effect on reducing problem behaviours. There are a variety of approaches that include a parent component. Among the most thoroughly evaluated interventions with a strong evidence base are behavioural family interventions (BFIs) (Comer, Chow, Chan, Cooper-Vince, & Wilson, 2013; Dretzke et al., 2009; Epstein et al., 2015; Kazdin & Blase, 2011). BFIs are based on theories that examine the contingencies around the acquisition and maintenance of problem behaviours, namely learning theory (Skinner, 1953), applied behaviour analysis (Baer, Wolf, & Risley, 1968) and social learning theory (Bandura, 1977). Learning theory emphasises the principles of positive and negative reinforcement impacting on the frequency and maintenance of a behaviour. Applied behaviour analysis highlights the importance of antecedents of problem behaviour. Social learning models stress the bidirectional and reciprocal nature of parent-child interactions and identify learning processes that maintain dysfunctional interactions (Patterson, 1982). BFIs also take into consideration the influence of additional factors on parent-child interactions, such as parental cognitions and attributions (Stern & Azar, 1998). There are a number of BFIs that have demonstrated efficacy for improving parenting practices and child behaviour, for example Incredible Years (Webster-Stratton, Reid, & Hammond, 2004), Parent Child Interaction Therapy (Eyberg, 1988), Parent Management Training – Oregon Model (Patterson, Chamberlain, & Reid, 1982) and Triple P (Sanders, 2012). BFIs have been shown to produce improvements in parenting and in child behaviours, which are typically maintained over time and often generalise to a variety of home and community settings (Barlow, Smailagic, Ferriter, Bennett, & Jones, 2010; Dretzke et al., 2009; Heinrichs, Kliem, & Hahlweg, 2014; Long, Forehand, Wierson, & Morgan, 1994; Serketich & Dumas, 1996). Studies have found additional benefits of BFIs, including reduced maternal depression and stress, reduced couple conflict over parenting issues, increased parental satisfaction and self-efficacy, and increased work satisfaction and work self-efficacy (Sanders, Kirby, Tellegen, & Day, 2014).

Limitations of Current Parenting Interventions

Despite the strength of the support for parenting interventions, relatively few parents actually participate in evidence-based programs (e.g., Sanders et al., 1999), with enrolment rates of face-to-

face interventions being around 10–34% (Breitenstein, Gross, & Christophersen, 2014). Participation rates are particularly low for parents of children with significant behaviour problems (Haggerty et al., 2002). This means that many families that could benefit from interventions never receive them. There are a number of reasons for this treatment gap. Firstly, the availability of parenting programs is typically limited. Service providers often do not have the capacity to make programs available for all families in need, and long waiting lists are common. The programs that are offered are frequently not evidence-based (Taylor & Biglan, 1998) and there are only limited options for treatment intensity and duration (Prinz & Sanders, 2007). Secondly, when services do offer programs, which are usually individual or group face-to-face interventions, there are often low recruitment and retention rates. The average attendance rate of parents that enrol to participate in face-to-face services varies between 35% and 50% of sessions in published studies (Breitenstein et al., 2014). The greatest barrier to intervention completion consistently reported by parents – even for self-directed interventions online – is time (Crisp & Griffiths, 2014). Additional barriers to program enrolment and completion include logistical difficulties (Spoth, Redmond, Hockaday, & Shin, 1996; Whittaker & Cowley, 2012) (e.g., transportation, work-schedule conflicts, availability and affordability of child care) and the financial cost of programs. Moreover, it is still not socially normative to request help with parenting, so there is often stigma attached to attending any type of parenting program (Koerting et al., 2013). Barriers to attendance are often particularly pronounced for 'high-risk' families, where parenting problems are coupled with other forms of adversity, including low income, single parenthood, parental mental health problems, high levels of stress or ethnic minority status. These parents are also more likely to report mistrust in providers or perceived ethnic and cultural barriers as additional obstacles.

The major consequence of low program availability and poor participation rates is inadequate program reach. This means the potential value of parenting programs in reducing the prevalence rates of child behaviour problems is greatly diminished.

A Public Health Approach to Parenting

To truly reduce the prevalence and burden of disruptive behaviour problems and close the treatment gap, evidence-based parenting interventions need to be made more widely available and accessible to parents. A promising development that aims to do this is the adoption of a public health approach to improve the quality of parenting in the entire population (Sanders, 2012). A population level approach to parenting aims to reach a large proportion of the population with effective parenting support (Biglan, 1995, 2015) by delivering programs in a variety of formats, across a variety of settings, and at different levels of intensity. Rather than a 'one size fits all' approach, a population focused system of evidence-based support acknowledges the different needs and preferences of parents. This includes complementing intensive interventions with prevention

and early intervention programs for families with mild to moderate problems. For example, offering brief, low intensity programs alongside traditional intensive individual or group-based parenting programs can be a valuable and cost-efficient strategy to increase the reach of parenting support.

Triple P as an Example of a Public Health Approach

One program that includes a range of low intensity options and represents a sophisticated example of a public health approach to parenting is the Triple P – Positive Parenting Program system. This multi-level system of parenting interventions comprises both universal and targeted interventions across five levels of increasing intensity, for parents of children from birth to age 16. Level 1 (Universal Triple P) is a media and communication strategy designed to raise awareness, destigmatise and encourage participation in parenting programs. It has the lowest intensity and the broadest reach. Level 2 (Selected Triple P) is a brief 1–2 session intervention or large group seminar providing general parenting information. Level 3 (Primary Care Triple P) comprises narrow focus, brief programs for parents with specific concerns. Level 4 (Standard Triple P) encompasses 8-10 session active skills training programs for parents wanting intensive training. Finally, Level 5 (Enhanced Triple P) is the most intensive parenting intervention that targets parenting, partner skills, emotion coping skills, and attribution retraining for the highest-risk families. Each level includes different program variants that are provided via a variety of formats, including face-to-face individual and group programs, self-directed programs and technology-assisted interventions (for a more detailed review please see Sanders, 2012). The various levels and delivery formats are important to meet the needs of families with differing intensity of child behaviour and parenting problems and different preferences and capacity regarding the delivery modes of interventions. Triple P's aim is to provide families with the minimal level of support necessary to enhance parental competence and confidence, and decrease the use of dysfunctional parenting strategies. This principle of minimal sufficiency is in line with Triple P's emphasis on self-regulation. Parents' skills as independent problem solvers are strengthened and they learn to monitor and modify their own behaviour rather than relying on continuing support from practitioners, and needing lengthy and ongoing interventions.

The components of the Triple P system have been subjected to numerous evaluations with a range of socio-economic, language and cultural groups. The most comprehensive meta-analysis conducted to date (Sanders, Kirby, et al., 2014) revealed significant short- and long-term improvements for children's social, emotional and behavioural outcomes (medium effect), parenting practices (medium effect), parenting satisfaction and efficacy (medium effect), parental adjustment (small–medium effect) and parental relationship (small effect). Several studies have also investigated the effects of Triple P as a public-health intervention and recorded significant population-level impact across a range of outcomes including behavioural and emotional problems

in children, parent-child relationship, coercive parenting, and parental depression and stress (Fives, Pursell, Heary, Nic Gabhainn, & Canavan, 2014; Sanders et al., 2008; Sarkadi, Sampaio, Kelly, & Feldman, 2014), as well as reduced incidence of child abuse, and hospitalisations, injuries and out-of-home placements due to maltreatment (Prinz, Sanders, Shapiro, Whitaker, & Lutzker, 2009).

Brief, Low Intensity Interventions

As previously discussed, the greatest parent-reported obstacle to participating in parenting programs is time (Spoth et al., 1996). Therefore, it is crucial that we investigate methods for reducing the length and burden of interventions while not compromising their effectiveness. Some work has already been done in this area. A number of brief, low intensity parenting interventions have been developed. When determining the efficacy of such programs, one difficulty lies in defining what constitutes a 'brief, low intensity intervention'. Often self-directed interventions are counted as low intensity, but they do not necessarily have to be brief. Low intensity interventions typically take less time to complete, can be consumed in bite-size chunks, and can often be delivered wholly or in part by paraprofessionals, volunteers, or in primary care settings (Bennett-Levy et al., 2010). While there is no commonly accepted definition of 'brief interventions', Tully and Hunt (2015) have defined them as programs with fewer than 8 sessions, in line with the definition of brief adult mental health interventions. In their systematic review of published papers on brief parenting interventions for children at risk of externalising behaviour problems they identified eight studies (six studies of Triple P, one of Parent Management Training – Oregon Model and one of the 123 Magic program). Significant positive effects for externalising child behaviour problems and dysfunctional parenting were evident across all studies, suggesting that brief interventions can be a sufficient level of support for many parents. Triple P research has examined the efficacy of a number of face-to-face low intensity interventions (Levels 2 and 3), some of which were included in the review by Tully and Hunt (2015). Small and large group seminars (Sanders, Prior, & Ralph, 2009; Sumargi, Sofronoff, & Morawska, 2014), brief individual programs (Turner & Sanders, 2006), as well as group discussion formats (Joachim, Sanders, & Turner, 2010; Mejia, Calam, & Sanders, 2015b; Morawska, Adamson, Hinchliffe, & Adams, 2014; Morawska, Haslam, Milne, & Sanders, 2011) have been found to be successful at increasing effective parenting and improving child behaviour.

Benefits of Brief Interventions

The efficacy of the reviewed programs supports the idea that brief, low intensity interventions can be a valuable addition to a public health approach to parenting support. Brief interventions are less resource-intensive and require less clinician time, making them a cost-effective approach to intervention. They can also be provided through different avenues that would not be equipped to offer more intensive programs, such as general practitioners, schools, childcare

centres, child health nurses etc., making them an accessible option. Brief, lighter touch interventions are also in line with consumer preference (Sumargi, Sofronoff, & Morawska, 2015). They are less taxing and burdensome on the family, making it more likely for parents to enrol in the first place and sustain sufficient motivation to complete an intervention. Brief interventions can be the first stage in a stepped care approach. Stepped care uses the least 'restrictive' minimal treatment option as a first-line approach that is still likely to produce significant positive outcomes (Bower & Gilbody, 2005). Treatment outcome is continuously monitored, and treatment is 'stepped up' to a more intensive intervention if insufficient improvements are made. Higher intensity interventions are reserved for people who do not benefit from lower intensity treatment, or for those who can be accurately predicted not to benefit from such treatments. Brief, low intensity parenting interventions can be the initial point of contact for many families that would not access more intense interventions, and thereby raise awareness of available services, and normalise and destigmatise parenting programs. For many families, a light touch intervention will be sufficient and meet their needs. However, if families derive some benefits from low intensity interventions but require additional support, they may be more likely to access more intensive assistance after having had a positive, non-threatening experience with an accessible brief program.

Self-directed and Web-based Interventions

Offering brief interventions is only one possible way of increasing the reach of parenting programs. Kazdin and Blase (2011), among others, have advocated a broad portfolio of delivery methods of interventions, including self-help programs and interventions delivered with the use of various technologies, particularly web-based interventions.

Self-directed Interventions

Self-help or self-administered programs are particularly well placed for inclusion in a public health approach as they are typically very cost-efficient and remove many of the common barriers to program participation. Families can complete programs in their own homes, in their own time and at their own pace. Self-help interventions come in various formats, such as written manuals or books, web-based or computer programs, video or audio files, or a combination of these. They are also often referred to as 'media-based' interventions. They can be completely self-directed or involve minimal therapist contact.

Research into the efficacy of self-administered programs for parenting advice is very promising. A Cochrane review investigating the effects of media-based treatments for behavioural problems in children (via audio or video tape, book, or computer/Internet manual) concluded that they have a moderate effect on child behaviour problems, with significant improvements being evident for the addition of up to 2 hours of therapist support (Montgomery, Bjornstad, & Dennis, 2009). Similar results were obtained in a meta-analysis by O'Brien and Daley (2011). A more recent

meta-analysis of the effects of self-directed parenting interventions on externalising child behaviour problems in particular found a large effect on parent report of externalising behaviour, and no significant difference regarding the efficacy of self-directed parenting programs compared with therapist-led interventions (Tarver et al. 2014).

The comparable outcomes of self-help interventions may be somewhat surprising, bearing in mind they lack a considerable amount of professional contact compared to therapist-assisted interventions. Parents rely entirely on their own motivation and ability to practise and implement the strategies introduced. However, parents who participate in self-help programs may derive a greater sense of personal agency and self-sufficiency from completing the program. The ability to attribute improvements in their child's behaviour to their own efforts as opposed to a therapist may compensate for the lack of therapeutic alliance and professional support. Perhaps it is also a certain type of parent that benefits more from self-directed interventions, for example parents that have a particularly high level of self-efficacy and motivation.

Self-administered interventions are also in line with evidence indicating that consumers prefer this delivery format for parenting advice. For example, Metzler, Sanders, Rusby, and Crowley (2012) asked an ethnically diverse sample of 162 American parents about their preferences for receiving parenting information. Parents' first choice was TV, followed by the Internet and written materials. A recent survey among parents in Panama also confirmed a preference for self-help intervention material (Mejia, Calam, & Sanders, 2015a).

Self-help interventions can be delivered in various formats. Technology and web-assisted self-directed interventions can be particularly useful as they offer the possibility of incorporating interactive features and video-based modelling. This may enhance universal engagement of both low- and high-risk populations (Jones, 2014), which could in turn increase outcomes.

Web-based Interventions

The Internet has rapidly penetrated all areas of human life. The use of information and communication technologies such as computers and mobile phones has become an integral part of our daily lives, starting as early as in toddlerhood. According to the Australian Communications and Media Authority (2015), 92% of Australian adults used the Internet in early 2014, including 99.6% of the 18–44 year age group (the group that includes most parents of young children).

Given its popularity and widespread use, the Internet represents an excellent vehicle for delivering evidence-based interventions. It has the capacity to bring programs to a much broader range of people by: 1) overcoming barriers common to face-to-face services; 2) destigmatising and normalising; and 3) harnessing the power of video-based modelling, interactivity and personalisation (Griffiths, Lindenmeyer, Powell, Lowe, & Thorogood, 2006).

Research on web-based programs targeting health problems has exploded in the last decade

(Lustria, Cortese, Noar, & Glueckauf, 2009; Mathieu, McGeechan, Barratt, & Herbert, 2013). Interactive online interventions have shown substantial effects on a broad range of psychosocial and health outcomes (Amstadter, Broman-Fulks, Zinzow, Ruggiero, & Cercone, 2009; Barak, Hen, Boniel-Nissim, & Shapira, 2008; Cugelman, Thelwall, & Dawes, 2011; Reger & Gahm, 2009; Ruwaard, Lange, Schrieken, & Emmelkamp, 2011; Wantland, Portillo, Holzemer, Slaughter, & McGhee, 2004), with effect sizes usually comparable to face-to-face delivery.

Taxonomy of web-based interventions.

Before we take a closer look at benefits of web-based interventions and their application in a parenting context, it may be helpful to define such interventions in more detail. Web-based interventions are not a homogenous group. They can differ substantially in their level of interactivity and their inbuilt components and features. Due to this heterogeneity, the terminology around web-based interventions is not consistent and varies greatly. Numerous terms have been used to label and describe interventions that make use of technology and the Internet. They include broad terminologies like 'telepsychiatry', 'telehealth' or 'e-mental health', describe interventions or programs as 'Internet-based', 'Internet-supported', 'web-based', 'media-based', 'online' or 'digital', represent 'online therapy', 'Internet therapy', 'computerised therapy', 'e-therapy', or 'cybertherapy', or depict online versions of specific therapy approaches (e.g., 'computerised CBT' or 'Internet CBT').

This inconsistency in labelling is accompanied, or perhaps caused, by a lack of clarity regarding a conceptualisation of the diversity of interventions and variety of factors involved in web-based interventions. To date, there is no cohesive taxonomy of web-based programs, which makes it difficult to describe interventions and their components and effects in a universal way. It also means that many different types of interventions are often included together in reviews and meta-analyses, which may explain why the reported outcomes and effect sizes can vary greatly.

Barak, Klein, and Proudfoot (2009) offer a useful conceptualisation of Internet-supported interventions. They define four categories: web-based interventions (including education interventions and self-guided or human-supported therapeutic interventions), online counselling and therapy (individual or group contact, synchronous or asynchronous), Internet-operated therapeutic software (e.g., robotic software, virtual reality programs), and other online activities (e.g., blogs, chat, podcast; used as standalone functions or as supplements to face-to-face or online intervention). This thesis focuses on web-based interventions, that Barak et al. (2009, p. 5) define as '*a primarily self-guided intervention program that is executed by means of a prescriptive online program operated through a website and used by consumers seeking health- and mental-health related assistance. The intervention program itself attempts to create positive change and or improve/enhance knowledge, awareness, and understanding via the provision of sound health-*

related material and use of interactive web-based components.' For the purpose of this thesis the terms 'online intervention' and 'web-based intervention' will be used interchangeably to describe interventions that deliver the majority of their treatment components via the Internet, with or without the addition of direct therapist contact or modern information technology tools.

In recent years, researchers in the broader area of web-based interventions for mental health have started to establish guidelines for the development (LaMendola & Krysik, 2008; Ritterband, Thorndike, Cox, Kovatchev, & Gonder-Frederick, 2009), research (Proudfoot et al., 2011), and ethics (Nijland, van Gemert-Pijnen, Boer, Steehouder, & Seydel, 2008) of web-based interventions. This may progress the field by increasing coherence and making the reporting of trials and outcomes more consistent.

Benefits of web-based interventions.

Naturally, self-administered online interventions share all the benefits of self-help interventions already discussed earlier. They have the potential to reach a large number of participants, many of whom would never make use of face-to-face professional assistance. Online interventions have great potential to normalise help seeking. The possibility of using services anonymously can be an appealing feature, especially for people who perceive stigma as a barrier to seeking professional assistance. Furthermore, they can be particularly useful in rural areas or low-resource settings, which often have poor accessibility of face-to-face mental health services (Griffiths & Christensen, 2007). Apart from the often high initial development cost, online interventions also present a cost-effective way of providing services (Donker et al., 2015).

In addition to these benefits, online interventions offer advantages and new opportunities to influence behaviour that go beyond those of other self-administered programs. From an implementation perspective, web-based programs have high program fidelity and virtually no drift as programs can be fully automated, ensuring that the quality of the intervention remains constant. Once developed, web-based programs also allow for relatively easy adaptation to a number of cultural groups and translation into multiple languages. From an ecological standpoint, web-based interventions reduce users' need for transport to attend therapy. This may reduce carbon dioxide emissions associated with treatment and therefore make interventions more environmentally desirable (Lindefors & Andersson, 2016). From a clinical point of view, there is potentially great value in the ability to tailor and personalise information according to the needs and attributes of the recipient. The capacity to include a variety of multi-media options, including video-based modelling, may increase user interest and engagement with interventions. Building in features that support interactivity and communication (e.g., chat rooms, forums) can also lead to increased behaviour change (Neuhauser & Kreps, 2003). Additionally, web-based interventions afford the possibility of built-in automated assessment, with the option of providing immediate feedback

directly to the client and/or to a client's therapist. The ongoing development of new gadgets and applications for hand-held devices will no doubt continue to open up countless unthought-of opportunities in this area and allow real-life monitoring of many behaviours and conditions.

Effective components of web-based interventions.

Although there is some research pointing to the value of interactivity, personalisation and other features of web-based interventions, to date little is known about how online approaches might be optimally designed to promote behaviour change. Online interventions often merge the content, theory and expected behaviour change mechanisms of an original, non-technology-assisted intervention with web-based persuasive strategies and features. These are regularly accompanied by additional support structures like therapist support or reminder systems. This makes it difficult to isolate specific factors associated with successful interventions. This section highlights some components that appear to be useful in online interventions.

Overall, it is generally assumed that offering multiple interactive online activities and including a greater variety of multimedia formats makes the intervention more dynamic and increases user interest and engagement (Ritterband et al., 2006). Greater user engagement can in turn increase the intensity of exposure to the intervention, referred to as dose. Dose is considered a key factor in achieving positive outcomes in interventions. Unfortunately, adherence is often low in online interventions and users typically withdraw early, meaning they may be less likely to receive a sufficient dose of the intervention (Eysenbach, 2005).

Another strategy to possibly improve adherence and increase intervention efficacy is to include guidance or additional support, either clinical or technical. The literature shows conflicting results on this. Several systematic reviews have found that guidance reduces dropout and probably increases intervention effects (e.g., Baumeister, Reichler, Munzinger, & Lin, 2014; Beatty & Binnion, 2016). However, perhaps the need for additional therapist support is dependent on the condition to be treated or on user characteristics. While some studies clearly support the superiority of clinician guidance (Ingersoll, Wainer, Berger, Pickard, & Bonter, 2016; Kleiboer et al., 2015), it is also possible that it is sufficient to provide automated reminders and only provide access to a clinician when the user asks for it (Titov et al., 2013). Some studies indicate that support does not need to be therapeutically oriented, but can be mainly practical and technical (Titov et al., 2010).

Another aspect that can increase adherence and influence psychological and behaviour outcomes is tailoring (Morrison, Yardley, Powell, & Michie, 2012). Tailoring is frequently combined with personalisation and describes a process for creating individualised content based on the user's input into the system, which is used to provide personally relevant feedback and communication. Interventions with dynamic tailoring have shown increased efficacy compared to tailored interventions based on only one baseline assessment (Krebs, Prochaska, & Rossi, 2010).

Although there are many cases of effective web-based interventions, it is mostly unclear why or how they work, and what components are crucial to their effectiveness. The often relatively low module completion rates (Melville, Casey, & Kavanagh, 2010) and low or unknown compliance with session activities keep researchers guessing how changes were brought about and what aspects of the intervention were useful in obtaining these changes. Further work is needed to define specific intervention components and mechanisms that promote optimal effectiveness of web-based interventions.

Web-based interventions for parenting support.

Considering the promising results of web-based interventions in other disciplines, it is surprising that only few online interventions for parenting support have been evaluated so far. There has been a proliferation of parenting websites on the Internet (Carter, 2007), some of which attract as many as hundreds of thousands visitors per month (O'Connor & Madge, 2004). These websites are typically static, non-interactive sites that simply supply information. Some websites offer additional features like parent support groups, forums, discussion boards, blogs, chat rooms etc. Most of these websites aim to increase parents' knowledge or provide a means for communication and social support, however their impact on parent and child outcomes is typically not evaluated and they are of varying scope and quality (Nieuwboer, Fukkink, & Hermanns, 2013b).

The few available interactive programs for parents have been largely designed for parents of infants (Feil et al., 2008), parents of children with traumatic brain injury (Wade, Carey, & Wolfe, 2006) or other health conditions (Ingersoll et al., 2016), and parents with mental health problems (Jones, Calam, et al., 2014; Kaplan, Solomon, Salzer, & Brusilovskiy, 2014). However, there is a lack of randomised controlled trials, particularly in the area of prevention and treatment of child emotional and behaviour problems. Some researchers have supplemented their original therapist-led interventions with technology enhancements (Helping the Noncompliant Child, Jones, Forehand, et al., 2014), provided programs on DVDs (Parenting Wisely, Gordon, 2000) or lent pre-loaded computers to trial participants, augmented with professional consultation via email, phone calls, and home visits (Incredible Years, Taylor et al., 2008). Yet there is a dearth of self-administered interventions delivered via the Internet.

Efficacy of web-based parenting interventions.

Several studies, including systematic reviews and meta-analyses, highlight the potential for technology to improve parenting interventions to better meet the needs of parents. A meta-analysis by Nieuwboer, Fukkink, and Hermanns (2013a) including 12 experimental studies of web-based interventions for parents showed a statistically significant medium effect (effect size 0.67) across parents outcomes (e.g., increased knowledge and improved attitudinal aspects, enhanced parenting skills) and a close to medium effect (effect size 0.42) on child outcomes (behaviour or attitudinal

outcomes). They concluded that guided and self-guided online interventions can make a significant positive contribution for parents and children.

Breitenstein et al. (2014) conducted a systematic review of parent training interventions that used a digital delivery format for a proportion of or the complete program. They included 11 studies, out of which six used the Internet. The studies that reported behavioural outcomes ($n = 4$) showed moderate average effect sizes for child and parent outcomes. The most recently published review of technology-assisted interventions for parents of 0–5 year old children (Hall & Bierman, 2015) included 48 studies, but identified only two RCTs that evaluated the impact of an online intervention for parents of children with behaviour problems compared to a waitlist control group (Internet-PMT based on COMET; Enebrink, Hogstrom, Forster, & Ghaderi, 2012; Triple P Online; Sanders, Baker, & Turner, 2012). More detail about these studies is provided in Chapter 3. Both studies showed moderate to large improvements in child behaviour problems and improvements in dysfunctional parenting.

A very recent RCT by Sourander et al. (2016) examined the effectiveness of an 11-session Internet-assisted parent training program for parents of children with disruptive behaviour problems screened from the population of 4-year-olds attending annual child health clinic check-ups in Finland. The interactive program included weekly telephone coaching as well as two booster sessions between 6 and 12 month follow-up assessment. The intervention resulted in significant improvements in parenting skills (effect size 0.53) and child externalising problems (effect size 0.34) at 12 months after randomisation, compared to an education control group. These results are encouraging, however the intensity of an 11-session intervention with phone support and booster sessions does not maximise the potential cost-effectiveness of web-based interventions and tells us little about the minimally sufficient approach to online parenting support. The study results do not give any information on the importance of the telephone calls in achieving the improvements in the intervention group. Furthermore, no information was given on the percentage of sessions completed or possible dosage effects.

Regarding dosage in the other reviewed papers, the proportion of digitally delivered content completion ranged from 42% to 99% in the review by Breitenstein et al. (2014) and interventions with more sessions generally showed lower session completion. Similarly, 43% (Sanders, Baker, et al., 2012) to 66% (Enebrink et al., 2012) of users completed all modules in the web-based interventions targeting child behaviour problems. Although these rates are similar to or slightly higher than face-to-face attendance rates, they indicate either that programs are longer than they need to be, or that online programs still struggle to fully engage parents and attrition presents a challenge.

The results from these reviewed papers need to be interpreted with some caution, as they included only a relatively small number of studies, which in many cases were pilot efficacy trials. They described a wide variety of interventions delivered with a number of different technological enhancements, therapist-assisted or self-directed, applied across a range of audiences and age groups and varying in terms of intervention content and intensity. Despite these possible limitations, the evidence for online parenting programs is very positive and encouraging for the field.

In summary, a number of interventions for parents have been developed and evaluated that make use of modern technology. However, only very few interventions use the Internet to target child behaviour problems. The available programs are fairly intensive and many parents still do not complete the whole intervention. To the best of the author's knowledge no brief, low intensity online parenting intervention has been evaluated that targets disruptive child behaviour. Considering the efficacy of brief, face-to-face programs in preventing and treating child behaviour problems, an investigation of whether a briefer intervention can be effectively delivered via the Internet is warranted. Research indicates that brief online interventions can have a larger impact and greater adherence than more intensive, longer interventions (Cugelman et al., 2011). Even if the achieved effect sizes were lower than those of more intensive interventions, their existence as part of a public health approach would still be beneficial, as small effects achieved by a large number of people can have significant population level impact.

This program of research aims to evaluate the efficacy of such a brief, low intensity online program in improving parenting and child behaviour for families with early onset child conduct problems. The next section describes the recently developed intervention that this thesis focuses on.

Triple P Online Brief.

Triple P Online Brief (TPOL Brief; Turner & Sanders, 2013) is an adaptation of the 8-module version of Triple P Online that aims to teach parents principles of positive parenting and strategies for promoting children's development. Triple P Online (TPOL; Turner & Sanders, 2011) has been evaluated in two RCTs, and shown to significantly decrease levels of disruptive child behaviour, dysfunctional parenting, parental anger, and inter-parental conflict; as well as significantly increase parenting confidence, the quality of the parent-child relationship, and parental adjustment (Sanders, Baker, et al., 2012; Sanders, Dittman, Farruggia, & Keown, 2014).

TPOL Brief is a low intensity, fully self-administered online intervention that is equivalent to a Level 3 Triple P intervention. It includes many of the previously highlighted features that are hypothesised to increase the efficacy of online interventions. The personalised program aims for a balance of simplicity and interactivity to promote parental engagement. Users complete the first module, which covers an overview of positive parenting strategies, and are then free to complete the additional four topic-specific modules in their preferred order. The program is heavily based on

video modelling of parenting skills, but also includes a number of written resources (worksheets, summary workbook) as well as downloadable podcasts of the content to allow for different learning styles and user preferences. It includes multiple interactive activities (i.e., reflection activities, goal setting, rating scales, multiple choice quizzes with video or text based feedback) and tailored, personally relevant feedback. As the program is fully self-administered, no clinician guidance or support features are built in. However, technical assistance and reminder emails and phone calls were administered as part of the RCT when necessary. For additional details about the intervention please refer to Chapter 3 and 4.

Challenges associated with web-based parenting interventions.

There are several potential challenges in employing an online intervention to improve parenting, some of which are discussed below.

First, the initial design and development of online interventions is often costly and time consuming. The program design requires an interdisciplinary approach and ideally involves a team of various professionals (Ritterband et al., 2003). For example, clinicians and health care providers can be involved as content and theory experts, interface design specialists like web designers work alongside videographers and audio engineers to make the content engaging, computer programmers and database developers build applications and data storage mechanisms. Often technical support personnel are still required to provide user support once the program has gone live. (See Stevens et al. (2008) for an example of the process.)

Second, the quick evolution of technology offers many exciting opportunities but also presents the challenge of keeping pace with advances (Riley et al., 2011). By the time an online intervention has undergone all the common phases of development, pilot testing and initial efficacy trialling, the technology could be outdated before it reaches the end consumer.

The third challenge relates to the dissemination of online interventions. Traditional models of bringing interventions to scale are often not applicable to online interventions. A careful decision needs to be made early on if the intervention will be marketed directly to the consumer or to practitioners and clinical service providers.

Fourth, even though self-directed parenting interventions can be as effective as therapist-assisted programs, online interventions without additional therapist contact may be viewed less positively by parents (O'Brien & Daley, 2011; Rabbitt et al., 2016). To date little is known about how to increase enrolment and retention for online interventions.

Lastly, and perhaps most importantly, is the question whether an online intervention is suitable for the intervention's target audience. On one hand, online interventions may reduce barriers to program attendance and therefore hold particular value in reaching families less likely to enrol in traditional, face-to-face parenting programs, for example families that face significant

adversity such as low socio-economic status, migration background or high levels of stressful life events. Despite an increased vulnerability of their children to develop emotional or behavioural problems (Bradley & Corwyn, 2002), these 'high-risk' parents face increased barriers to program attendance and are less likely to complete a traditional parenting program than other parents (Cunningham et al., 2000; Kazdin, Mazurick, & Bass, 1993). One the other hand, there are consistent concerns about a 'digital divide' or 'knowledge gap', suggesting that parents from lower socio-economic backgrounds may not have the same Internet access, skills and comfort with technology as parents with higher socio-economic status (Rothbaum, Martland, & Jannsen, 2008).

The suitability of an online intervention can also depend on the setting or country in which it is to be implemented. While web-based delivery is among the preferred formats in settings with reliable Internet, this may be different when Internet availability is limited. For example, no Internet access was considered the most significant barrier to accessing a parenting program (Triple P) among a sample of 32 mothers of 3−8 year olds living in battered women's shelters in South Africa (Wessels & Ward, 2016). While the women regarded the program strategies and materials as acceptable and useful, they identified web-based delivery as the least preferred delivery method. In this setting, self-directed programs with telephone assistance were the most preferred option. Similarly, 59 per cent of parents from low resource communities in Panama reported having no computer literacy, and online interventions were rated as the least preferred delivery format (Mejia et al., 2015a).

Careful consideration of the intervention's target audience and the use of feasibility studies can go a long way to ensuring the suitability of online interventions for a certain population. The increasing penetration of the Internet is likely to further reduce disparities in Internet access and use in the future. However, even though we may be theoretically able to reach a broad range of families online, we still need to understand who is likely to benefit from these interventions so programs can be targeted at such families, or support mechanisms can be investigated for families that may derive fewer benefits. To date, very little is known about moderators of online parenting programs. Some meta-analyses of face-to-face parenting programs suggest that lower socio-economic status has a negative impact on the effectiveness of parenting programs (Lundahl, Risser, & Lovejoy, 2006; Reyno & McGrath, 2006). However, other studies (e.g., Gardner, Hutchings, Bywater, & Whitaker, 2010) do not support this idea and show equal efficacy of parenting programs for all parents, irrespective of socio-economic status. Intervention trials should aim to extend our knowledge of factors associated with better outcomes and include predictor and moderator analyses to identify those that might benefit most from an online parenting intervention.

In addition to the lack of understanding regarding moderators of outcomes, little is known about the acceptability of web-based interventions by families outside of research trials and whether

they would participate if programs were made available on a population level as part of a public health approach to parenting. There is a paucity of information about parents' preferences for online parenting support, how they would like to access programs and in what format, which features and topics they would prefer and what additional support mechanisms may be needed. Research needs to closely examine the views and preferences of parents – the ultimate consumers of parenting interventions. Engaging consumers throughout the development, evaluation and dissemination of interventions has the potential to increase program acceptability, and improve intervention quality and the 'ecological fit' of interventions and prospective users (Sanders & Kirby, 2012). Taking parents' views and preferences into consideration thereby increases the chances of wide adoption once interventions are disseminated.

Study Aims and Research Questions

This thesis aims to address the paucity of research in online parenting support, particularly in the area of brief, low intensity parenting interventions. It aims to address three broad areas:

1. The Internet has become an integral part of our daily lives, but research examining its potential to enhance parenting support is still in its infancy. **The first aim of this research is to investigate the feasibility of providing parenting support online.** Study 1 takes a consumer approach to examine parents' current use of the Internet to access parenting information, and the extent to which this information appears useful for parents from a range of socio-economic backgrounds. A quantitative cross-sectional survey design was employed to examine this in an Australian community sample.

2. While previous research has proven the efficacy of professionally-delivered low intensity, brief parenting interventions and a small number of studies have successfully trialled parenting support delivered on the Internet, no research has combined the benefits of both and tested the efficacy of a brief, low intensity online parenting program. **The second aim of this research is to evaluate whether a newly developed brief online version of the Triple P– Positive Parenting Program can decrease dysfunctional parenting and improve child behaviour.** Study 2 used a randomised controlled trial design to evaluate the efficacy of TPOL Brief compared to an Internet-use-as-usual control group.

3. Simply asking whether an online parenting intervention works overlooks potentially differential outcomes for different users and does not consider how the intervention could be improved further. **The third aim of this research is to investigate possible predictors of program use and intervention effects**. Study 3 employs regression analyses of the RCT data to identify those most likely to benefit from a brief online parenting intervention.

Overview of Remaining Chapters

The following three thesis chapters consist of manuscripts submitted for journal publication (Chapter 2) or manuscripts currently in preparation for submission (Chapters 3 and 4). They follow conventions for reporting empirical trials, with background, methodology, results and conclusions presented in each. However, Chapters 3 and 4 are slightly modified to suit the flow of the thesis and allow for more detailed information than typically found in published papers.

Chapter 2 presents results of the first empirical study. An Australia-wide cross-sectional survey of 459 parents was carried out to investigate parents' use of the Internet to access parenting information, and the extent to which this information is useful for parents from a range of socio-economic backgrounds.

Chapter 3 describes Study 2, an evaluation of a self-directed online parenting intervention that aligns with many of the consumer preferences identified in Study 1. Results of an RCT evaluating the efficacy of TPOL Brief for parents of 2–9 year old children with early onset conduct problems are reported. Short- and longer-term parent and child outcomes and their clinical significance are discussed, as well dosage effects and effects on secondary parents. The chapter also reviews program use data alongside client satisfaction and intervention feedback.

Chapter 4 presents secondary analysis data of the RCT using regression analyses to model predictors of program use and improvements in child behaviour and parenting (Study 3). A range of potential predictors is investigated, with a focus on socio-demographic characteristics of the family.

Chapter 5 integrates the findings from the cross-sectional survey, the RCT and the predictor study and examines their contribution to the wider literature. Implications for research and practice are discussed. The final chapter also points out some limitations of the research and makes suggestions for future studies.

Collectively this thesis aims to demonstrate that brief parenting support provided via the Internet aligns well with parents' current help-seeking behaviour and preferences, and can be an effective way of offering practical parenting support to a wide range of families.

CHAPTER 2:
WHO USES ONLINE PARENTING SUPPORT?:
A CROSS-SECTIONAL SURVEY EXPLORING AUSTRALIAN PARENTS' INTERNET
USE FOR PARENTING SUPPORT

Background

Evidence-based parenting programs are widely recognised as important in the prevention and treatment of childhood social, emotional, and behavioural problems (Epstein et al., 2015; World Health Organization, 2009). However, despite their demonstrated effectiveness, few parents actually participate (Breitenstein et al., 2014; Prinz & Sanders, 2007). Availability of evidence-based parenting programs in the community is often sparse, and programs on offer are usually in group or individual formats, delivered face-to-face. The reach of face-to-face parenting programs is restricted by substantial challenges in recruiting, engaging, and retaining parents, who face numerous barriers to attendance (Koerting et al., 2013; Spoth & Redmond, 2000). This failure to engage with families means that parenting interventions are falling short of their potential to deliver population level improvement in children's mental health and long-term outcomes. To assure that a larger proportion of parents is reached, a comprehensive public health approach is needed that utilises a blend of targeted and universal interventions and makes parenting information and support widely accessible in a range of formats. One format that is receiving increasing attention is web-based program delivery. A growing collection of studies investigating the efficacy of web-based or Internet-supported parenting interventions suggests that these approaches show promise in achieving improvements in parenting and child behaviour (e.g., Enebrink et al., 2012; Sanders, Baker, et al., 2012).

According to the Australian Communications and Media Authority (2015), 92% of Australian adults used the Internet in the six months to May 2014, including 99.6% of the 18–44 year age group. At the same time, nine in 10 adult Australians (94%) had a mobile phone, of which 74 per cent were smartphones. One particularly highly connected subgroup of the population is parents (Allen & Rainie, 2002). Already in 2012−13, almost every Australian household with children under 15 years of age had access to the Internet at home (96%), as compared to 78% of households without children under 15 (Australian Bureau of Statistics, 2012-13). These numbers are expected to have increased, and it is safe to assume that almost all Australian parents of young children are able to access the Internet. Given its popularity and widespread use, especially among parents, the Internet has been proposed as an alternative vehicle for delivering evidence-based parenting programs. Internet-based interventions may hold particular value in reaching families less likely to enrol in traditional, face-to-face parenting programs, for example families with significant

logistical barriers to attending services (e.g., distance, work commitments preventing daytime attendance), minority groups, and families facing significant adversity such as low income, lower education, single parent status, and high levels of stressful life events. This latter group are typically referred to as vulnerable or 'high-risk' or 'at-risk' families. They experience greater psychological distress due to adverse social, economic and emotional circumstances, which place their children at greater risk for the development of emotional and behavioural problems (Bradley & Corwyn, 2002; Greenberg, Lengua, Coie, & Pinderhughes, 1999). High-risk parents often experience many more logistical barriers to accessing support and may also have difficulties successfully managing the demands of a multi-session, intensive parenting program. So, despite the increased vulnerability of their children, these parents are less likely to enrol in and complete a parenting program than other parents (Cunningham et al., 2000; Kazdin et al., 1993). Web-based interventions have the potential to eliminate many barriers to program participation and offer families feasible support.

However, concerns have been raised about the quality of information online (Eysenbach, Powell, Kuss, & Sa, 2002; Pandolfini, Impicciatore, & Bonati, 2000), the potential for unhelpful peer-to-peer interactions (Eysenbach, Powell, Englesakis, Rizo, & Stern, 2004), and the exclusion of individuals who experience difficulties accessing the Internet (Willis & Tranter, 2006). There is a concern that the very people that could benefit most from online interventions are also the ones that are most disadvantaged in regard to Internet access and use. Before we can go about providing evidence-based parenting support online, the feasibility of the Internet as a suitable vehicle to reach parents in general, and high-risk parents in particular, needs to be established. The current study uses a cross-sectional survey methodology to explore this in an Australian context.

Early research raised concerns about differences in digital use and identified a 'digital divide', which refers to the inequality in access to the Internet between people of low and high socio-economic status (SES). As Internet penetration increases and may even reach saturation, the question becomes less one of access and more one of use and outcomes. Some more recent evidence suggests that the digital divide may be closing (Zickuhr & Smith, 2012) or even reversing (i.e. low-income Internet users spend more time on the Internet at home than high-income users; Pantea & Martens, 2014) due to decreasing costs and increasing user-friendliness of computing technologies. The concern has shifted towards the idea of a 'knowledge gap' or 'usage gap', suggesting that low SES individuals may not have the comfort or proficiency with using technology and consuming web-based information as higher SES individuals (Bonfadelli, 2002; Rothbaum et al., 2008; van Deursen, van Dijk, & ten Klooster, 2015) and that this uneven spread of information across income brackets perpetuates inequalities.

Research examining parental Internet use is scarce and often outdated, considering the fast moving pace of this field. Although efforts have been made to identify different types or subgroups

of Internet users amongst parents, studies examining demographic differences have been inconclusive. Several studies have found a positive relationship between parents' SES and general Internet use. For example, research indicates that parents with more education and higher income appear to have greater access to the Internet, use it more, have more sophisticated information searching skills, and experience more benefits of use than those with less education and from lower-income backgrounds (Martin & Robinson, 2007; Park, Kim, & Steinhoff, 2016; Rothbaum et al., 2008; Zickuhr & Smith, 2012). However, in other studies SES was not related to Internet access or use (Sarkadi & Bremberg, 2005). Age has also been found to play a role in patterns of digital use. For example, a study of parents seeking health information found that younger mothers tended to consult the Internet when a doctor was not available, but older mothers tended to turn to books and the doctor's answering service (Bernhardt & Felter, 2004). There is some evidence suggesting that gender is also a predictor of Internet use, with women using the Internet less than men (Hargittai, 2010; Kennedy, Judd, Dalgarno, & Waycott, 2010). However, women have been found to search more for health information online than men (Bidmon & Terlutter, 2015; Stern, Cotten, & Drentea, 2011). Mothers are also more likely than fathers to use social media as a parenting resource and engage their online social networks for information and support, for example via Facebook (Duggan, Lenhart, Lampe, & Ellison, 2015). In addition to demographics, an important aspect to consider may be comfort with using technology (Walker, Dworkin, & Connell, 2011). In a study by Doty et al (2012) comfort with technology was a more salient predictor of parents' online information seeking and social activities than income.

The Internet has become an increasingly popular method of accessing parenting information and advice in comparison to traditional approaches such as home visits, therapy and parenting groups (Devolin et al., 2013; Metzler et al., 2012; Thorslund, Hanse, & Axberg, 2014). As yet, minimal research has examined parents' Internet use in regard to parenting information and support, or examined demographic differences in parents' use of online parenting advice. The few studies that have been published have largely been conducted in the USA. For example, Radey and Randolph (2009) investigated parents' use of information resources with a survey among over 1000 American parents. They found that mothers, younger parents, unmarried parents, parents of younger children, and those with higher levels of education were more likely to use the Internet for parenting information than their counterparts. Plantin and Daneback (2009) conducted a literature review to examine how parents use the Internet to find information and support regarding children, health and family life. Their sample comprised 94 English articles published in the medical, educational, and social sciences. They concluded that although the majority of parents searched for both information and support online, first time middle class mothers aged 30–35 were the most active. However, several studies have reported diminishing SES differences (Berkule-Silberman, Dreyer, Huberman,

Klass, & Mendelsohn, 2010; Sarkadi & Bremberg, 2005).

The current research builds on the findings of previous studies examining differences in the use of the Internet in general, and for parenting information and support in particular, on the basis of demographic characteristics. Understanding the differences in parents' use of the Internet for parenting could help identify those who might benefit most from online parenting programs, and inform more effective intervention design and delivery to appeal to current users and attract current non-users. Evidence that online parenting information and programs are able to reach a wide variety of parents, including those typically less likely to participate in parenting interventions, would underscore the value of online interventions in a public health approach to parenting support and represent an important contribution to the literature.

Specifically, this study aimed to examine: a) parents' access to and use of the Internet, b) parents' use of different sources of parenting information, particularly online sources, and c) preferred delivery modalities for receiving information about parenting (e.g., television, Internet, attending a parenting group). As a particular focus was on web-based parenting support, the study also examined the extent to which use of web-based parenting information and perceived usefulness ratings of online programs could be predicted by families' socio-demographic characteristics (e.g., gender, age, perceived financial comfort), the degree to which parents reported child behaviour problems, as well as parents' Internet use and their experience with online courses and parenting programs in general. Based on the studies by Radey and Randolph (2009) and Plantin and Daneback (2009), it was predicted that mothers, younger parents, parents of younger children, single parents, and those with higher levels of education and income would be more likely to use the Internet for parenting information than their counterparts. This study also aimed to explore whether parents classed as 'at-risk' would differ in the parenting sources they use, and their usefulness ratings of a range of parenting sources (particularly web-based sources), compared to families that do not fall in the at-risk group.

Method

Procedure

Ethical approval to conduct an Australia-wide survey was obtained from The University of Queensland's Ethical Review Board. Several participant recruitment methods were used to ensure that the sample was not biased towards using online parenting resources. The survey was advertised through schools and childcare centres, community notice boards, services that supported parents, sporting clubs, and similar. Services provided the link to the survey on their own websites, via email distribution, handouts, Facebook posts and word of mouth. Concurrently, the study details were shared on parenting websites and forums. The advertisement invited parents of 2–12-year-old

children to share their experiences as parents, and their views on today's parenting information and support options, including online support and social media. The age range was restricted to childhood, as infancy or adolescence are distinctive critical periods with unique developmental and health needs (Garbutt et al., 2012). Parents of infants or teenagers may face dissimilar parenting challenges, and may therefore require different support through potentially different avenues. In addition, the survey asked questions that focussed on primary objectives of parenting interventions aiming to improve child behaviour and adjustment (e.g., externalising and internalising behaviour problems), which were not targeted at younger or older children. From about one month into the study, information was collected regarding recruitment sources to determine how parents had heard about the study. Of the 402 respondents that were asked this question, the majority of parents (40.3%) indicated receiving the study details through their child's school or childcare centre. About 21.1% of respondents received information on Facebook, twitter or other social media and 7.5% through a parenting forum. Word of mouth recruited 9% of respondents and 1.5% saw or read information in the media. Other recruitment sources were named by 23.1%. These included a variety of sources (e.g., colleagues, direct email from research coordinator, workplace, sports clubs and newsletters from support organisations). Parents willing to participate completed a consent form online before completing the survey. They were informed that they could withdraw from the survey at any time by logging out or closing their browser. Therefore, participants that only completed a part of the survey and did not progress to the end were deemed as having withdrawn their consent and excluded from the analyses. Parents were also able to skip questions they did not want to answer.

Measures

Demographics.

Parents provided general demographic information on the *Family Background Questionnaire* (FBQ; Sanders & Morawska, 2010), such as their age, marital status, their child's age and gender, number of children in the household, financial comfort and ethnic background.

Child behaviour.

The *Child Adjustment and Parent Efficacy Scale* (CAPES; Morawska, Sanders, Haslam, Filus, & Fletcher, 2014) assesses the level of child emotional and behavioural difficulties. The scale consists of a 30-item intensity scale with two subscales measuring children's behaviour problems and emotional maladjustment, and a 20-item self-efficacy scale measuring parent's self-efficacy in managing specific child problem behaviours. The initial validation study found the internal consistency for the CAPES to be excellent for Intensity ($\alpha = .90$), Behaviour ($\alpha = .90$) and Self-Efficacy ($\alpha = .96$), and adequate for Emotional Maladjustment ($\alpha = .74$) (Morawska, Sanders, et al., 2014). Regarding construct validity, CAPES intensity showed reasonable convergent validity as

measured by AVE estimates (average variance extracted), CR estimates (composite reliability), and examination of factor loadings. Regarding discriminant validity, the results confirmed that the behaviour and emotional maladjustment subscales of CAPES intensity represent two distinct, yet correlated constructs. CAPES Self-efficacy showed good convergent and discriminant validity. Only the intensity subscale of the CAPES was used for this study. Parents rated their child's behaviour over the last four weeks on 26 items assessing behaviour concerns (e.g., *My child yells, shouts or screams*) and behavioural competencies (e.g., *My child accepts rules and limits*) and 4 items assessing emotional maladjustment (e.g., *My child worries*) on a scale from 0 (*Not true of my child at all*) to 3 (*True of my child very much, or most of the time*). The total score was calculated (range 0–90), where higher scores indicate higher intensity of problems. The internal consistency for this sample was high ($\alpha = .90$).

Participation in parenting programs.

Respondents were asked to indicate whether they had ever participated in a structured program on child development, child behaviour or parenting.

Internet use.

General Internet use patterns were assessed using a series of specially designed questions. Respondents indicated their methods of accessing the Internet, the frequency of access (i.e. *Every day* to *Less than several times a month*), and hours spent online in a typical week (e.g., *Less than 2 hours* to *More than 10 hours*). Respondents also rated their confidence in using the Internet on a 5-point scale from 1 (*Not at all confident*) to 5 (*Totally confident*) and indicated whether they had ever done an online course, Internet workshop, webinar or similar to learn something new or improve a skill.

Information sources.

Respondents were asked whether they had used any of 21 listed sources for parenting information in the previous six months, and asked to specify any additional sources. The list included professional sources (e.g., family doctor), non-professional sources (e.g., friends), media sources (e.g., parenting websites, social media) as well as using previous experience with older children as a source of information.

Preference for receiving parenting information.

Respondents were asked to rate the perceived usefulness of accessing a parenting program via a number of delivery formats on a 5-point scale ranging from 1 (*not at all useful*) to 5 (*very useful*). A dichotomous variable of useful (very useful/useful) vs. not useful (neutral/not useful/not at all useful) was derived. Possible delivery formats included more traditional access to services

such as group and individual parenting programs, as well as media-based options such as television, radio, or the Internet.

Risk index.

To examine the extent to which adverse socio-economic circumstances were associated with preference for different parenting sources, a cumulative risk index was calculated. Several areas of interest were included because of the pervasive role they appear to play in the onset and prognosis of child emotional and behavioural problems, the participation in and attrition from traditional parenting programs, and the likelihood of being disadvantaged in regard to Internet access and use. The risk index was calculated by summing the following factors: having a large family (four or more children living in the household), recent migration background (moved to Australia within the last two years), being of Australian Aboriginal or Torres Strait Islander origin, reporting elevated levels of child behaviour problems (1.5 SD above the mean on the CAPES Intensity scale), not being employed, educational attainment of high school or less, financial hardship (having experienced a time in the past 12 months where the family was unable to meet their essential expenses) and not living with a partner (being single, divorced or widow/er). Any respondent with two or more risk factors present was deemed to fall in the 'at-risk' category.

Data Analyses

Descriptive statistics were generated to characterise respondents' use of parenting information sources as well as parents' interest in receiving parenting information through various channels. Bivariate tests of associations between categorical variables were conducted using chi-square analyses. Binomial logistic regression analysis was conducted to investigate the ability of the demographic characteristics to predict Internet use. Binomial logistic regressions were also used to examine relationships between a series of variables (e.g., socio-demographic characteristics, intensity of child maladjustment) and use of parenting websites or social media for parenting support. In these models, respondents who used parenting websites as a source of parenting information (or social media respectively) were compared with those who did not. Hierarchical regression was performed to determine factors that predict the ratings of perceived usefulness of web-based parenting programs. Examination of missing data found that 1% of values was missing across all variables. There were no differences on any demographic or key outcome variables between parents that had missing data and those who did not. Thus, no imputation method was carried out for the descriptive analyses and the statistical analyses were performed using SPSS Version 22.0 with pairwise exclusion of missing data. For the regression models, missing values on predictor and dependent variables were imputed using the expectation-maximisation algorithm in SPSS.

Results

Demographics

Table 2.1 presents the demographic characteristics of the sample. A total of 459 respondents completed the online survey. To be eligible, respondents needed to care for a child between 2 and 12 years of age and live in Australia. The majority of respondents were mothers (87.8%). Family composition was explored, with the majority being married (69.3%), or living with a partner (15.1%). The number of children at home ranged from 1 to 6 ($M = 2.12$, $SD = 0.97$), 7% of families had four or more children living in the household. Respondents were asked to indicate the age and gender of the youngest child they were most concerned about (or if they had no concerns, the age of the youngest child in the household). Target children were slightly more likely to be male (51.3%) with a mean age of 5.79 years ($SD = 3.13$, range 2–12). The mean age for respondents was 36.69 years ($SD = 7.13$, range 19–72 years). The majority (67.5%) of respondents were working either part-time or full-time. In 91% of families at least one parent earned an income. Participants reported their highest level of education: 16.7% had completed high school or less, 21.3% had technical college or apprenticeship qualifications, and 62% had a university degree. Almost a third of families (31.9%) had experienced a time during the previous 12 months where their household could not meet essential expenses; 26.1% indicated that after paying for essentials like food and housing, they did not have enough money left over to purchase the things they really wanted. Thirty-six per cent of families identified themselves as very poor, poor or only just getting along financially. This suggests that the sample includes a significant proportion of parents who perceive themselves to be in economic adversity. Respondents came from a diverse cultural background; 20.1% of respondents were born overseas and 5.5% were speaking a language other than English in the home. Regarding the ethnic or cultural group that the respondents most identified with, the majority (63.2%) identified as Oceanian (e.g., Australian, Australian Aboriginal, Torres Strait Islander, Maori, New Zealander, Polynesian) or European (27.5%). Just over a quarter (27.8%) of respondents were living in rural or remote areas, and all Australian states were represented with the majority of respondents residing in Queensland.

One third (33.5%) of the sample exhibited no risk factors and for 36.4% one risk factor existed, while a further third (30.1%) was classified as 'being at-risk', with two or more risk factors present ($n = 76$ had two risk factors, $n = 34$ had three risk factors, $n = 13$ had four risk factors, $n = 3$ had five risk factors).

Table 2.1 *Demographic Characteristics of the Sample*

Variable	M	SD
Target child age (years)	5.79	3.13
Respondent age (years)	36.69	7.13
No. of children at home	2.12	0.97
	n	%
Child gender		(*N* = 459)
Male	234	51.3
Female	222	48.7
Marital status		(*N* = 456)
Married, cohabiting	385	84.4
Divorced/Separated	45	9.9
Single	23	5.0
Other (e.g., Widow/er)	3	0.7
Parental status		(*N* = 459)
Mother (Biological/Adoptive/Foster)	403	87.8
Father (Biological/Adoptive/Foster)	50	10.9
Other (e.g., Grandmother)	6	1.3
Education level		(*N* = 455)
Some high school	20	4.4
Completed high school	56	12.3
Trade/Technical college qualification	97	21.3
University degree	150	33
Postgraduate degree	132	29
Migration background		(*N* = 457)
Born in Australia	365	79.9
Lived in Australia 10 years or longer	54	11.8
Lived in Australia 2-10 years	33	7.2
Moved to Australia within 2 years	5	1.1
Employment		(N=455)
Full-time	152	33.4
Part-time	155	34.1
Not working	148	32.5
Experienced financial hardship		(*N* = 457)
Yes	146	31.9
No	308	67.4
Don't know	3	0.7

Child Behaviour and Participation in Parenting Programs

Only a small percentage of respondents (6.9%) rated their child's behaviour in the elevated range on the CAPES (1.5 SD above sample mean), indicating most children had low rates of emotional and behavioural problems. The majority of respondents (68.4%) had never participated in a structured program on child development, child behaviour or parenting.

General Internet Access and Use

All respondents had access to the Internet. Nearly everyone accessed the Internet every day (94.8%) or several times a week (4.1%), with only four parents using the Internet about once a week, and one person using it less than several times a month. The majority of respondents (53.3%) spent more than 10 hours a week online. Only 4.4% were online less than 2 hours weekly, 17.9% spent 2-5 hours and 24.5% spent 5-10 hours online. A median split was performed to categorise respondents into higher use (more than 10 hours spent online) vs. lower use (10 hours or less spent online). Almost all respondents (97.8%) were confident or totally confident using the Internet. Two-thirds of respondents (61.3%) had previously completed an online course.

Is there a digital divide for Internet use?

To examine the extent to which individual participant characteristics predict parents' Internet use, binomial logistic regression analysis was performed on the variable of hours spent online. All other Internet related variables did not have sufficient variability, as Internet access, daily use and confidence were high for all respondents. The predictors used were the key variables outlined in the literature as being associated with Internet use: parent gender, parent age, as well as educational attainment, employment and financial hardship as indicators of SES. The regression model was not significant, $\chi^2 = 6.96$, df = 5, $p = .224$. For the current sample, demographics did not predict the amount of time parents spent online during a typical week. Table 2.2 shows beta values along with odds ratios and their confidence intervals.

Table 1.2 *Predictors of Internet Use*

Predictor	B	*S.E.*	Sig	*OR*	95% CI *OR*	
					Lower	Upper
Parent gender	0.70	0.33	.033	2.02	1.06	3.85
Parent age	-0.01	0.01	.542	0.99	0.96	1.02
Educational attainment	-0.40	0.26	.125	0.67	0.40	1.12
Employment	-0.15	0.21	.484	0.86	0.57	1.30
Financial hardship	-0.04	0.21	.858	0.96	0.65	1.44

At-risk families did not differ from families in the low risk group in their frequency or confidence of Internet use or hours spent online. They were however significantly less likely to access the Internet on a tablet or iPad ($\chi^2 = 12.99$, df = 1, $p < .001$), or at their office or place of work ($\chi^2 = 29.65$, df = 1, $p < .001$). There was no difference regarding other means to access the Internet: home dial-up ($\chi^2 = .816$, df = 1, $p = .366$), home broadband/ADSL/Wifi ($\chi^2 = .001$, df = 1, $p = .975$), public location such as library ($\chi^2 = .077$, df = 1, $p = .782$), friend or family member's house ($\chi^2 = .005$, df = 1, $p = .943$), smartphone using Wifi only ($\chi^2 = .133$, df = 1, $p = .715$), smartphone using 3G and Wifi ($\chi^2 = 2.410$, df = 1, $p = .121$).

Sources of Parenting Information

Respondents in this sample received information from a variety of sources. Table 2.3 displays the rank ordered parenting information sources according to the percentage of respondents using each source. The most frequently used sources were friends and other parents (77.1% of respondents) and parenting websites (64.5%), followed by previous experience with older children (58.8%), and spouse/partner (49.5%). The most popular professional sources of information were childcare providers/teachers (48.4%) and family doctor (37.3%). Almost half of the respondents (45.1%) indicated using social media (e.g., Facebook, Twitter). Parenting seminars and parenting programs rated among the least used sources of information. Few respondents indicated that they used additional sources other than those listed, with the most common source being the parent's workplace.

Table 2.3 *Sources of Parenting Information Used*

Sources of parenting information	Total n (%)[a]	At-risk n (%)[b]	Not at-risk n (%)[c]	x^2	p
Friends/other parents	354 (77.1)	91 (72.2)	234 (80.1)	3.19	.074
Internet: parenting websites (e.g., Raising Children)	296 (64.5)	78 (61.9)	194 (66.4)	0.80	.372
Previous experience with your older children	270 (58.8)	75 (59.5)	173 (59.2)	<0.01	.958
Spouse/partner	227 (49.5)	43 (34.1)	161 (55.1)	11.55	<.001***
Childcare providers/teachers	222 (48.4)	58 (46.0)	148 (50.7)	0.76	.383
Your parents/in-laws, or relatives	222 (48.4)	56 (44.4)	144 (49.3)	0.84	.360
Internet: social media (e.g., Facebook, Twitter, forums)	207 (45.1)	69 (54.8)	125 (42.8)	5.06	.025*
Your GP (General Practitioner)/family doctor	171 (37.3)	48 (38.1)	102 (34.9)	0.38	.536
Parenting books	151 (32.9)	33 (26.2)	104 (35.6)	3.55	.060
Parenting magazines or articles	111 (24.2)	26 (20.6)	73 (25.0)	0.93	.335
Brochures/fact sheets/tip sheets	114 (24.8)	25 (19.8)	79 (27.1)	2.45	.117
Other health professionals e.g., psychologist, nurse etc.	110 (24.0)	34 (27.0)	70 (24.0)	0.43	.513
Parent support groups or playgroups	87 (19.0)	25(19.8)	53 (18.2)	0.17	.684
Television programs	87 (19.0)	22 (17.5)	58 (19.9)	0.33	.567
Newspaper articles	80 (17.4)	15 (11.9)	58 (19.9)	3.87	.049*
Your child's paediatrician	65 (14.2)	27 (21.4)	30 (10.3)	9.30	.002**
Parenting seminars or talks	54 (11.8)	15 (11.9)	35 (12.0)	<0.01	.981
Radio programs	29 (6.3)	7 (5.6)	19 (6.5)	0.14	.712
Telephone lines (e.g., Parentline)	28 (6.1)	9 (7.1)	14 (4.8)	0.93	.334
DVDs or videos	20 (4.4)	6 (4.8)	12 (4.1)	0.09	.763
Parenting programs (including self-directed or online)	20 (4.4)	6 (4.8)	13 (4.5)	0.02	.889

Note. More than one option could be endorsed. [a] $n = 459$, [b] $n = 126$, [c] $n = 292$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Significantly fewer parents in the at-risk group had sought support from their spouse or partner (this is not unexpected considering single parenthood is one of the risk factors), or received information from newspaper articles. Significantly more at-risk parents had sought information from their child's paediatrician or social media. There was no significant difference for the use of parenting websites or any other information sources. Table 2.3 presents χ^2 and p-values for the comparison of at-risk families to families without increased risk.

Predicting use of parenting websites and social media for parenting information.

Binomial logistic regression analyses were carried out in order to investigate which of a series of variables could predict whether or not respondents used parenting websites or social media. All demographic variables that have been identified in previous studies on parents' use of online information were included in the models, even if they did not correlate significantly in the current sample: parent age, parent gender, child age, single parent status, educational attainment, employment status and financial hardship. In addition, intensity of child maladjustment and hours spent online were included.

Social media use. The model was a significant fit for the data, $\chi^2 = 93.49$, df = 9, $p < .001$. Parents who were younger (OR = 0.95, 95% CI = [0.91, 0.98]), female (OR = 0.19, 95% CI = [0.08, 0.47]), had younger children (OR = 0.92, 95% CI = [0.85, 1.00]), were not working (OR = 0.52, 95% CI = [0.34, 0.82]) and spent more than 10 hours per week online (OR = 2.86, 95% CI = [1.87, 4.36]) were significantly more likely to use social media for parenting information.

Parenting website use. The model was a significant fit for the data, $\chi^2 = 22.39$, df = 9, $p = .008$. Only child age was a significant predictor (OR = 0.89, 95% CI = [0.82, 0.96]), with parents of a younger child being more likely to use parenting websites for parenting information.

Perceived Usefulness of Accessing Parenting Information in Different Ways

Respondents rated the perceived usefulness of accessing a parenting program in a number of different ways. The results are displayed in Table 2.4, rank ordered according to per cent of respondents rating each way as useful or very useful. The highest perceived usefulness ratings were given to parent seminars and individually tailored programs, followed by television program, self-directed web-based program and social media.

Chi-square analyses comparing at-risk families to families without increased risk were carried out for each proposed hypothetical modality of accessing parenting programs (see Table 2.4). At-risk families were significantly less likely than families without increased risk to rate radio segments, YouTube videos, Podcasts about parenting, and Workplace access as useful, and significantly more likely to perceive social media as a useful way of accessing parenting support.

Table 2.4 *Ratings of Perceived Usefulness of Modalities for Accessing Parenting Programs*

Ways of accessing parenting programs	Total (%) rating useful [a]	At-risk (%) [b]	Not at-risk (%) [c]	x^2	p
Parent seminar (e.g., seminar on general principles of positive parenting)	67.3	61.9	66.9	1.92	.166
Individually tailored programs (e.g., meeting individually with a clinician)	64.5	68.0	64.5	0.48	.487
Newspaper article (e.g., weekly article discussing parenting)	63.3	57.9	65.9	2.37	.124
Television program (e.g., showing parents working through a program)	61.3	54.8	64.8	3.74	.053
Self-directed web-based parenting program with practitioner support	61.2	62.7	59.8	0.31	.578
Social media (e.g., parenting forums)	59.3	69.8	55.8	7.25	.007*
Self-directed web-based parenting program (e.g., structured online program)	58.4	62.6	55.8	1.64	.201
Group program (e.g., attend weekly small group sessions)	56.0	58.4	54.2	0.62	.430
Home visits (e.g., a clinician coming to your home to discuss parenting)	54.4	57.1	54.7	0.21	.651
Self-directed workbook (e.g., workbook with readings and exercises)	45.5	47.6	44.4	0.35	.553
Using a smart phone app that assists with parenting	44.8	42.1	46.2	0.60	.438
Listening to podcasts about parenting	43.8	33.6	48.1	7.40	.007**
Radio segment (e.g., a regular radio segment discussing parenting)	43.8	32.5	47.4	7.88	.005**
Self-directed workbook with telephone assistance	43.5	46.0	42.3	0.49	.482
Workplace access (e.g., access a parenting program within the workplace)	43.0	34.1	46.9	5.78	.016*
Watching YouTube or similar videos dealing with parenting	37	28.6	39.9	4.88	.027*
Access to a parenting program through your religious organisation	21.7	26.8	18.9	3.25	.072
Receiving text messages with parenting information	18.8	15.1	20.1	1.48	.223

Note. Per cent of respondents rating each modality as useful includes ratings of 'useful' and 'very useful', n differs because of missing data, [a] $n = 445$-451, [b] $n = 123$-126, [c] $n = 285$-288, $*p < .05$, $**p < .01$, $***p < .001$.

Predicting perceived usefulness ratings of web-based parenting programs.

Results of the two-step hierarchical regression analyses performed on the usefulness ratings of self-directed web-based parenting programs (averaged across the ratings for self-directed programs with and without practitioner support) are presented in Table 2.5. Independent variables entered in block 1 were socio-demographic characteristics (parent age, parent gender, child age, single parent status, educational attainment, employment status and financial hardship) as well as reported intensity of child maladjustment. Block 2 included Internet specific variables (hours spent online during the week, use of parenting websites or social media for information, having done an online course before) as well as whether or not parents had previously participated in a parenting program.

Table 2.5 *Predictors of Perceived Usefulness Ratings of Web-Based Parenting Programs*

Step	Variable	R^2	R^2 Change	Standardised β
1	Parent age	.036	.036*	-.07
	Parent gender			-.09
	Child age			.05
	Single parent			.02
	Education			-.09
	Employment			-.01
	Financial hardship			.08
	Child maladjustment			.07
2	Parent age	.096	.059***	-.07
	Parent gender			-.07
	Child age			.07
	Single parent			.01
	Education			-.06
	Employment			-.03
	Financial hardship			.08
	Child maladjustment			.06
	Parenting website use			.19***
	Social media use			-.01
	Hours online			-.05
	Online course			.14**
	Parenting program			.06

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

At step one, demographic variables explained only 3.6% of the variance. Although the model was a significant fit for the data, $F(8,450) = 2.13$, $p = .032$, none of the included variables were significant predictors. In block 2, currently using parenting websites for information and previously having done an online course were significantly associated with higher usefulness ratings, explaining a further 5.9% of variance, $F_{changed}(5,445) = 5.82$, $p < .001$.

Discussion

This study examined Australian parents' preferences for parenting resources, particularly web-based support, and explored potential predictors of online information use, with a view to establishing whether online parenting support is a feasible option for a broad range of families. To the best of the author's knowledge, this is the first time this has been explored in an Australian context. The majority of survey respondents were frequent and confident Internet users who accessed parenting information online. Contrary to previous literature (Rothbaum et al., 2008), there was no indication of a digital divide regarding general Internet access and use based on education, family finances or other demographics in this sample.

Regarding the use of online parenting sources, results partly replicate those by Radey and Randolph (2009) and Plantin and Daneback (2009). Parents who were younger, female, had younger children, were not working, and spent more than 10 hours online per week were significantly more likely to have used social media for parenting information. Being a parent of a younger child also predicted parenting website use. Level of education and income were not associated with reported use of either online source in this sample. The results indicate that younger parents still appear to use the Internet more. However, such age differences are likely to be a temporary phenomenon, as the current younger parents are increasingly incorporating the Internet into several facets of their lives and are unlikely to decrease their Internet use significantly as they grow older. As expected, women were more actively using online parenting sources than men. This mirrors their offline behaviour, as women are still often the primary caregivers and the ones that feel most responsible for the health and wellbeing of their children (Child Trends, 2002). As Carey, Wade, and Wolfe (2008) determined, a factor that can play an important role in web-based interventions is prior experience with technology. In this sample, current use of parenting websites and familiarity with online courses positively impacted the usefulness rating of web-based programs.

Interestingly, no association was found between the severity of reported child behaviour problems and parents' use of the Internet for parenting. This indicates that parents of children without behaviour problems may be just as likely to use the Internet for information and support as parents of children with problematic behaviour. If this is the case then web-based information and

programs could also be an ideal vehicle for prevention as they can reach a wide variety of families, not just those already experiencing problems.

At-risk families were just as likely to use the Internet as families without additional risk factors. In fact, similar to the finding that unemployed parents were more likely to use social media, a higher proportion of at-risk parents had used social media as a source for information and more at-risk parents perceived accessing parenting support through social media as useful. This is consistent with research by Love, Sanders, Metzler, Prinz, and Kast (2013) who established the feasibility of an online parenting program delivered in a social network online community with a sample of highly vulnerable, high poverty parents in Los Angeles. When the intervention was consequently trialled with a population of disadvantaged, high-risk parents, participants were engaged in the social media and gaming features of the program and reported significant improvements in parenting practices, stress and child behaviour. Encouragingly, the majority of participants also shared what they learned with friends, family and other parents (Love et al., 2016).

Overall, it seems that informal social networks are well utilised among parents, with friends and other parents being the most frequently used source of parenting information in this sample. Parenting support services may benefit from targeting existing social networks, offline and through social media, to make parents aware of available parenting support options and provide evidence-based information. For example, parents could be encouraged to help normalise help seeking for parenting by sharing positive experiences with parenting services with their peers, and passing on parenting information.

The results of this study need to be interpreted in light of some limitations. The sampling strategy and the online nature of the survey may have attracted parents who were biased to want to fill out a survey or parents that were particularly comfortable and frequent Internet users. However, parents who were recruited offline (e.g., via school/ childcare, word of mouth or the media) demonstrated a very similar pattern of Internet use as the pattern reported for the whole sample. For example, almost everyone accessed the Internet every day (93.8%) or several times per week (5.2%) and 97.2% were confident or totally confident Internet users. They also reported using similar sources of parenting support. In Australia, Internet use is very high, particularly among parents (Australian Communications and Media Authority, 2015). Although current Internet users are likely to represent those most attracted to online applications, future research should include current non-users or infrequent users to investigate their attitude to online parenting support. Despite attempts to recruit diverse families, respondents were primarily mothers with higher levels of education, but with characteristics otherwise similar to the general population (Australian Bureau of Statistics, 2012). The recruited sample may be less at risk than the general population as it has a higher SES and the reported level of child behaviour problems was comparatively low. A sample

that includes a higher representation of fathers and more at-risk families would be desirable to determine the robustness of the current findings. Including a larger number of at-risk families would also enable more detailed analyses, for example investigating the predictive value of risk as a continuous variable in the regression models.

The current study did not assess the quality of parenting information or advice accessed. Therefore it cannot be determined whether the parenting strategies and advice parents receive through the different avenues is in fact evidence-based and helpful, or merely someone's personal opinion or experience. Furthermore, parents' preferences regarding hypothetical modalities of accessing programs do not necessarily equate to having the intention to access such programs in real life. The feasibility and acceptability of online parenting programs needs to be further assessed systematically in efficacy and effectiveness trials to confirm that the Internet is in fact a viable way to provide evidence-based parenting support.

The present study provides valuable insight into Australian parents' Internet use for parenting information and support. Survey results indicate that Internet use for parenting advice is common, even among those typically less likely to access other forms of parenting support. As both advantaged and disadvantaged families similarly endorsed the Internet for parenting information, providing parenting support online may be a viable way to expand the reach of evidence-based parenting programs. Including technology-assisted interventions in a comprehensive public health approach may bring us one step closer to decreasing the prevalence of emotional and behavioural problems in children through effective parenting.

CHAPTER 3:
A RANDOMISED CONTROLLED TRIAL EVALUATING A LOW INTENSITY INTERACTIVE ONLINE PARENTING INTERVENTION, TRIPLE P ONLINE BRIEF, WITH PARENTS OF CHILDREN WITH EARLY ONSET CONDUCT PROBLEMS

Background

Mental disorders are one of the most common chronic health problems affecting children and adolescents. A recent meta-analysis including 41 studies from 27 countries (Polanczyk et al., 2015) estimated the prevalence of mental disorders in children and adolescents to be 13.5%. Estimates for prevalence rates in Australia are similar to those reported internationally. Results from the second Australian Child and Adolescent Survey of Mental Health and Wellbeing (Lawrence et al., 2015) indicate a 12-month prevalence rate for anxiety disorders, major depressive disorder, ADHD and conduct disorder of 13.9% amongst 4- to 17-year-olds. Disruptive behaviour disorders are among the most common reasons for referring children to mental health assessment and treatment, and also rank among the most serious and costly health problems (Cohen & Piquero, 2008). Disruptive behaviour disorders are characterised by high rates of noncompliant, hostile and defiant behaviours, often including aggressiveness. Prevalence rates have been estimated as 5.7% for any disruptive disorder, 2.1% for Conduct Disorder (CD) and 3.6% for Oppositional Defiant Disorder (ODD) (Polanczyk et al., 2015). In addition to these severe problems, many parents report frequent milder disruptive child behaviours, such as losing their temper (16%), arguing with adults (17%) or refusing to cooperate with adults (13%) (Sanders, Markie-Dadds, Rinaldis, Firman, & Baig, 2007). Short- and longer-term consequences for the children themselves, their families and society are severe. Behavioural difficulties in early childhood are predictive of a range of difficulties throughout childhood, adolescence and adulthood. These include poor academic achievement (Brennan et al., 2012), peer relationship difficulties (Kouros et al., 2010) and antisocial behaviour (Trentacosta & Shaw, 2009) as well as teenage pregnancy, criminal behaviour, drug abuse, unemployment, and mental health problems (Kosterman et al., 2009; van der Molen et al., 2015). Because of the wide-ranging implications, early intervention is both desirable and justified, even for children who do not meet diagnostic criteria for a clinical diagnosis of ODD or CD.

Positive parenting programs are widely recognised as one of the most effective ways of preventing and treating child behaviour problems. Behavioural family interventions based on social learning and cognitive-behavioural principles have established a good evidence base (e.g., Comer et al., 2013; Dretzke et al., 2009; Epstein et al., 2015; Kazdin & Blase, 2011). However, their usefulness is limited due to a number of factors. Unfortunately only low numbers of parents participate in parenting programs (Sanders et al., 1999), and participation rates are particularly low

for parents of children with significant behaviour problems (Haggerty et al., 2002) or families that face additional challenges like parental adjustment or relationship problems, living in adverse socio-economic circumstances, belonging to an ethnic minority group, or being affected by other physical or mental health problems (Kazdin & Wassell, 2000). Additionally, it is still not socially normative to seek assistance with parenting, so there is often stigma attached to attending any type of parenting program (Koerting et al., 2013). Finally, the logistics of attending sessions (e.g., timing difficulties, cost, transport, child care) may prevent many parents from participating in programs (Spoth et al., 1996; Whittaker & Cowley, 2012). This means that the majority of parents of children at risk of developing conduct problems do not access parenting interventions.

A promising trend in recent years has been the adoption of a public health approach to improve the quality of parenting at a population level and truly impact the rates of children developing these problems (Sanders, 2012). Population level approaches merge prevention with intervention programs and aim to make programs available universally as well as for at-risk families specifically. A population level approach to parenting aims to include brief, cost-efficient strategies with wider population reach than traditional intensive individual or group parenting programs. Self-administered programs are particularly well placed for inclusion in a public health approach as they are typically very cost-efficient and remove many of the common barriers to program participation. Families can complete programs in their own homes, in their own time and at their own pace. Technology and web-assisted self-directed interventions can be particularly useful. They offer the possibility of incorporating interactive features and video-based modelling and may enhance the engagement of universal and at-risk populations (Jones, 2014).

Although research into parents' use of technology has increased in the last decade, and technology-assisted interventions have been developed to support parents and children with a number of health issues, there is a scarcity of rigorously evaluated programs for parents of children with CD, ODD or early onset emotional and behavioural problems. A recent literature review of studies that describe the application and evaluation of technology-assisted interventions for parents of 0–5-year-old children identified 48 studies (Hall & Bierman, 2015). Multiple forms of technology assistance were included, comprising web-based platforms, discussion forums, mobile devices, and video conferencing. Only three RCTs were identified that targeted parents of children with behaviour problems. Firstly, Enebrink et al. (2012) evaluated the efficacy of a web-based program with additional email support and discussion forum based on the COMET parent management training program. The program had 7 sessions, each taking about 1.5hours to complete. In addition, research assistants supported the parents in their work with the program for an average of 5 hours and 10 minutes per family. Results indicated a significant decrease in reported child behaviour problems for intervention group parents compared to control, with improvements

maintained at 6-month and 18-month follow-up assessments (Hogstrom, Enebrink, Melin, & Ghaderi, 2015). The other two programs were technology-assisted versions of the Triple P – Positive Parenting Program. Triple P is a multi-level system of interventions that includes programs of different intensity that can be delivered in a variety of formats and settings (Sanders, 2012). This makes Triple P well suited for roll out at a population level. One aim of the Triple P system is to offer the minimally sufficient support that a family needs. A number of brief, low intensity interventions have been evaluated and proven effective in improving parenting and reducing child behaviour problems, for example a self-help workbook (Morawska & Sanders, 2006), a TV series on parenting (Sanders, Montgomery, & Brechman-Toussaint, 2000), topic specific discussion groups (e.g., Joachim et al., 2010) and brief interventions delivered by primary care providers (Turner & Sanders, 2006). The first study of a technology-assisted version of Triple P included in Hall's review evaluated the effect of watching a reality television series compared to watching the television series with self-directed and web-based intervention support. The first series included six 30-minute episodes and the second series five 60-minute episodes. Parents that received the additional support (Triple P self-help workbook and web support involving downloadable tip sheets, audio and video streaming of positive parenting messages and email support) were more satisfied with the program and reported significantly fewer child behaviour problems post-intervention, less parental conflict, and greater improvement in parenting practices (Calam, Sanders, Miller, Sadhnani, & Carmont, 2008). The second technology-assisted version of Triple P, Triple P Online (TPOL), is an eight-module version of Standard Triple P, which includes videos, personalised activities, podcasts, printable forms and summaries as well as text and email reminders. No professional support was given and the average (administrative) contact time with project staff was 11 minutes per participant over the course of the trial. Compared to an 'Internet-use-as-usual' control group, parents assigned to TPOL reported a decrease in dysfunctional parenting, parental anger and child behaviour problems (Sanders, Baker, et al., 2012). Although all three technology-assisted programs included in Hall's review described positive outcomes for parenting and child behaviour, they also reported high attrition and relatively low program completion (43% to 66% of users completed all modules). This highlights the need to develop engagement strategies and procedures to increase retention and program completion, particularly if the extent of improvement is associated with the number of sessions or modules completed by the parent. Additionally, the provision of even briefer programs that are less taxing and time consuming could lead to the completion of the full, intended dose of an intervention and provide valuable information about the minimally sufficient dose to bring about significant change.

The current research aims to extend the existing literature on online parenting interventions by evaluating the effects of a brief, low intensity online parenting program, based on the

established, evidence-based Triple P, with parents of children with early-onset conduct problems. Triple P Online Brief (TPOL Brief; Turner & Sanders, 2013) corresponds to a Level 3 intervention in Triple P's multilevel system, which is a narrow focus parent skills training program designed for parents of children with mild to moderate conduct problems in specific problem areas. It was hypothesised that at follow-up, compared to parents in an Internet-use-as-usual control condition (IUAU), parents in the TPOL Brief condition would report 1) lower levels of disruptive child behaviour; 2) lower levels of dysfunctional parenting; 3) higher parental efficacy in managing their child's behaviour; 4) improved parental adjustment, lower parental anger, and lower levels of conflict over parenting immediately post intervention and at 9-month follow-up assessment. Consumer satisfaction with the program and feedback regarding the intervention components were also obtained.

Method

Participants

Participants were 200 parents with a 2–9-year-old child ($M = 4.4$, $SD = 1.9$) with elevated levels of disruptive behaviour (see Table 3.1 for key demographic details of the sample). Target children (the child that the participant reported being most concerned about) were slightly more likely to be male (55%). The majority of children (78%) were living in an original family, 13% in a single parent household. Participants were mainly mothers (91%), living with a partner (married or de facto: 82%). Data for the co-parent (secondary parent), where applicable, was also obtained for 125 families.

The mean age for primary parents was 35.7 years ($SD = 5.9$, range 22–55 years). The majority (44%) was working part-time; 32% were not working. Participants reported their highest level of education: 20% had completed high school or less; 25% had technical college or apprenticeship qualifications; and 56% had a university degree. The sample included a significant proportion of parents who perceived themselves to be in economic adversity: 30% identified as poor or only just getting along financially; 20% had experienced a time during the previous 12 months where their household could not meet essential expenses; 46% indicated that after paying for essentials like food and housing, they only had enough money left over to purchase *some* of the things they really wanted. Regarding cultural background, 2.5% of participating families reported being of Aboriginal and/or Torres Strait Islander background; 25% were born overseas and 8% spoke a language other than English in the home. All participants reported accessing the Internet every day (96%) or several times a week. Seventy-five per cent of families had never accessed a parenting program before enrolling in this program.

Recruitment.

Recruitment was conducted in school and childcare centres in the greater Brisbane, Ipswich, Sunshine Coast and Gold Coast areas in Queensland, Australia. To promote participation of families from socio-demographically and culturally diverse backgrounds, recruitment specifically targeted lower SES suburbs as identified by the ABS Socio-economic Indexes for Areas (Australian Bureau of Statistics, 2011), as well as non-profit agencies that serve ethnic and racial minorities. Parents self-identified as having difficulties with their child's disruptive behaviour. Parents expressed interest by telephone or via a website developed for recruitment and screening purposes, and were asked to complete a number of screening questions online to assess their eligibility. Eligibility criteria were: 1) a 2–9-year-old child for whom parents reported elevated levels of child behaviour problems; 2) parents identified at least one of four topics covered in the program (i.e. disobedience, fighting and aggression, going shopping, self-esteem) as an area of concern; 3) access to a computer and broadband Internet connection; and 4) the parent's ability to read English at Year 5 level. The Total Scale of the *Strength and Difficulties Questionnaire* (Goodman, 1999) was used to determine the level of behaviour problems. To ensure sufficient variation in the base rate severity of child behaviour problems to enable moderator effects to be identified, children were included if they scored in the borderline clinical range or higher (a score of 14 or more). The exclusion criteria were: 1) the child had a disability including language and speech impairment; 2) the parents were currently seeing a professional for the child's behaviour difficulties; 3) the parents were receiving psychological help or counselling; or 4) the parents were intellectually disabled.

Measures

Demographics.

Family demographic data were collected using the *Family Background Questionnaire* (FBQ; Sanders & Morawska, 2010). Parents also completed questions about their Internet confidence and frequency of Internet use.

Child behaviour and parenting.

The primary outcome measure for change in child behaviour was the *Eyberg Child Behaviour Inventory* (ECBI; Eyberg & Pincus, 1999). The ECBI is a 36-item measure of perceptions of disruptive behaviour in children aged 2–16 years. It includes a measure of the frequency of disruptive behaviours (Intensity scale) rated on a 7-point scale, and a measure of the number of behaviours that parents identify as a problem (Problem scale). Higher scores indicate greater child behaviour problems. Both scales had good internal consistency in this sample ($\alpha = .89$ and $\alpha = .88$ respectively).

The *Child Adjustment and Parent Efficacy Scale* (CAPES; Morawska, Sanders, et al., 2014) measures child behavioural and emotional adjustment, and parental efficacy. The 26-item

Behavioural Problems subscale assesses behaviour concerns (e.g., *My child rudely answers back to me*) and behavioural competencies (e.g., *My child accepts rules and limits*), and the 4-item Emotional Problems subscale assesses emotional adjustment (e.g., *My child worries*). Items are rated on a 4-point scale (0 = *Not true of my child at all* to 3 = *True of my child very much, or most of the time*), with higher scores indicating greater problems. In the current sample the CAPES had high internal consistency for the Behavioural ($\alpha = .86$) and Emotional Problems subscales ($\alpha = .80$). The 20-item Efficacy Scale measures parents' level of confidence in managing child emotional and behavioural problems on a 10-point scale (1 = *Certain I can't deal with it* to 10 = *Certain I can deal with it*), with higher scores indicating greater parent efficacy. In this sample the Efficacy Scale had high internal consistency ($\alpha = .90$).

The primary outcome measure for changes in ineffective parenting was the *Parenting Scale* (PS; Arnold, O'Leary, Wolff, & Acker, 1993). This 30-item questionnaire measures three dysfunctional discipline styles: Laxness (permissive discipline), Over-reactivity (authoritarian discipline, anger, meanness and irritability) and Verbosity (long reprimands or reliance on talking), with higher subscale scores indicating more dysfunctional parenting practices. Items are rated on a 7-point scale with the most and least effective parenting strategy being the anchors. Internal consistency for the current sample was: Laxness ($\alpha = .85$), Over-reactivity ($\alpha = .81$), and Verbosity ($\alpha = .54$).

A *Behaviour Concerns and Parent Confidence Scale* was created specifically for the study. Parents rate 11 common child behaviour concerns in regard to how much of a problem each behaviour currently is with their child (on a scale from 1 = *Not at all* to 4 = *Very much*), and how confident they are that they can successfully deal with this behaviour, even if it is currently not a problem (on a scale from 1 = *Certain I can't do it* to 10 = *Certain I can do it*). The list of concerns includes the topics covered in the program (e.g., disobedience) as well as additional topics not specifically addressed by the program (e.g., mealtime problems) to identify if child behaviour change could be achieved both in targeted as well as non-targeted topic areas and settings. Total scores are obtained by summing the problem scores (Problem scale) and by summing the confidence scores (Confidence scale), respectively. The internal consistency of the scales for this sample was low, particularly for the Problem scale ($\alpha = .43$ and $\alpha = .70$, respectively), so results should be interpreted with caution.

The *Parent–Child Play Task Observation System* (PCPTOS; Rusby, Metzler, Sanders, & Crowley, 2015) was used to code observed parent-child interaction. The primary caregiver and target child were observed during a 30-minute clinic observation including different tasks: joint free-play; child following simple instructions; unstructured waiting time; and independent play while parent is busy (i.e. the parent completes a phone interview while the child is asked to play by

themselves). These observation settings were selected to replicate experiences that occur regularly in family life. The video recordings of these observations were coded using the PCPTOS. Each interaction between the parent and child is coded in real time, using a four-digit code. The content of the behaviour of the parent and child is coded as well as the affect or emotional state expressed. The code sequence consists of: Initiator—parent or child (first digit), Content (second and third digits), and Affect (fourth digit). The affect code was not used for this study. Content codes include social engagement codes (e.g., approval), parent directives (e.g., clear start directive) and child response to parent directives (e.g., non-compliance), and physical codes (e.g., aversive contact). Coding hierarchies have been developed to minimise using multiple codes for one behaviour. Coding was carried out by three trained research assistants who were kept masked regarding participant experimental condition, assessment phase and whether or not it was a reliability check. Time unit inter-rater agreement was computed on a randomly selected 15% of observation sessions using GSEQ v5.1 with a tolerance window of 6 seconds (Bakeman, Quera, & Gnisci, 2009). The inter-rater agreement for content codes at baseline was 80% with a Kappa of .76. A composite measure, rate per minute of observed child negative behaviours, was used to evaluate the effects of the intervention on levels of disruptive behaviour. It consists of aversive verbal, complaint, demanding, interrupting, inappropriate rule-breaking behaviours, noncompliance to parent's directive, and aversive physical. A second composite measure, rate per minute of observed parent negative, was derived to examine changes in ineffective parenting. It includes the codes parent aversive verbal, aversive directive and aversive physical.

Parental anger, conflict over parenting and parent adjustment.

The *Parental Anger Inventory* (PAI; Sedlar & Hansen, 2001) assesses anger experienced in response to misbehaviour in children aged 2–12 years. Parents rate 50 child-related situations as problematic or not (Problem scale), and the degree of anger evoked by each situation on a scale from 1 = *Not at all* to 5 = *Extremely* (Intensity scale), with higher scores indicating greater problems and more intense anger. The Problem and Intensity scales showed good internal consistency (α =.88 and α =.95, respectively) in the current sample.

The *Parent Problem Checklist* (PPC; Dadds & Powell, 1991) is a 16-item questionnaire that measures inter-parental conflict over child rearing (e.g., the extent to which parents disagree over rules and discipline, have open conflict over parenting issues, and undermine each other's relationship with their children). The PPC yields an index of the number of problems (Problem scale), and an intensity rating for the problems listed (Extent scale). Both subscales had good internal consistency in this sample (α = .82 and .91, respectively).

The *Depression Anxiety Stress Scales-21* (DASS-21; Lovibond & Lovibond, 1995) is a short form of the original 42-item questionnaire that assesses symptoms of depression, anxiety, and stress

in adults. Parents indicate the extent to which each item applied to them over the past week, on a scale from 0 = *Did not apply to me at all* to 3 = *Applied to me very much, or most of the time*, with higher scores indicating poorer adjustment. The internal consistency of the scales was good in this sample (Depression α = .90, Anxiety *a* =.78 , Stress α =.89).

Program use and client satisfaction.

An online reporting site was built to track and record patterns of program use. The parameters captured include website access date and time spent on each module. At post-assessment, intervention group parents were asked to indicate some details about their program use (e.g., which modules they accessed) and give feedback regarding several features of the online intervention (e.g., quality of video clips, level of difficulty of presented content, usefulness of provided resources) on a 5-point scale from 1 = *Very poor/Not at all helpful/Strongly disagree* to 5 = *Very good/Very helpful/Strongly agree.*

The *Client Satisfaction Questionnaire* (CSQ; Sanders, Markie-Dadds, & Turner, 2012) is an 8-item survey that measures consumer satisfaction with the quality of service; and how well the program met the parent's needs, increased the parent's skills and decreased the child's problem behaviours. Internal consistency was high in the current sample (α =.93).

Design

This study was a randomised, controlled trial employing a two group (intervention vs. control) by time (pre-intervention, post-intervention, 9-month follow-up) design. Families were randomly assigned to either the online intervention condition (TPOL Brief) or control condition (Internet-use-as-usual [IUAU]). Participants completed assessments at three time points: pre-assessment (on enrolment in the study), post-assessment (8 weeks later, the intervention group's program accounts expired after this time), and at 9-month follow-up.

Procedure

This project followed the National Health and Medical Research Council's ethical guidelines for participation of human subjects. Ethics approval was received through The University of Queensland Social and Behavioural Sciences Ethical Review Committee (project number: 2012000161). The project was registered with the Australian New Zealand Clinical Trials Registry (ID: ACTRN12613000025730).

Before commencement of the study, the randomisation allocation sequence was generated using a list of computer-generated random numbers in blocks of four. This sequence was concealed from any staff members involved in the study and held by personnel not involved in the research, who assigned participants to condition sequentially (in order of initial enrolment), and stratified for perceived financial comfort. Perceived financial comfort was determined based on the parent's response to the question: 'Given your current needs and financial responsibilities, how would you say you and your

family are getting on?' A dichotomous variable of high comfort (*Prosperous, Very comfortable, Reasonably comfortable*) vs. low comfort (*Just getting along, Poor, Very poor*) was derived and used for stratified allocation to condition. In addition, a randomly selected subsample of 50% of participants, equally distributed across the two groups, was assigned to complete the clinic observation procedure.

Following screening, eligible parents were emailed a link to complete the pre-intervention assessment and informed consent process online. Families assigned to the IUAU control condition were free to search the Internet for useful parenting information as they wished. Families assigned to the intervention condition were emailed individual log in details and were prompted to complete the online program within 8 weeks (at which time post-assessment was conducted regardless of the number of modules completed). For two-parent households, both parents could request individual accounts if preferred. Participants received an email from the project team to check they had received the log in details if they hadn´t activated their account after 1 week. During the 8-week intervention period participants were also contacted by email, and by phone if no response was received, if they had not logged on to the program for 3 weeks. Only technical assistance was offered, no professional advice or guidance in regard to program content was given in any correspondence with participants. The online intervention was offered free of charge. Families received AUD $20 shopping vouchers as an incentive for completing post- and follow-up assessments, and where applicable, AUD $50 shopping vouchers for completing clinic observations. On completion of the study (i.e., after 11 months), participants in the control group were offered access to the online intervention.

Intervention

TPOL Brief (Turner & Sanders, 2013) is a low intensity, self-administered online parenting program designed to be interactive, video-enriched, and personalised. It aims to promote positive parenting practices, including the use of positive attention and praise, teaching strategies, antecedent strategies to avoid problems in high-risk situations, and effective discipline for misbehaviour. It incorporates elements designed to engage users and improve knowledge acquisition, positive self-efficacy, and behaviour activation. These elements include: 1) a semi-organised pathway through the modules and user friendly navigation; 2) video-based modelling of parenting skills; 3) personalised content; 4) interactive exercises to prompt parental problem solving, decision making and self-regulation; and 5) downloadable resources. Users receive personal log in details and complete the program at their convenience. Cultural sensitivity is achieved through the use of multicultural video models and a self-regulatory framework that enables parents to select goals informed by their own values, beliefs and traditions. The five program modules are: Getting started with positive parenting; Disobedience; Fighting and aggression; Going shopping; and Self-esteem. The first module introduces positive parenting

strategies and makes parents aware of parent traps. The remaining modules focus on exemplars of behaviour-specific and setting-specific application of this knowledge and skill set. In order to encourage parents to generalise the skills learned, the program uses the principle of training sufficient exemplars so that knowledge is applied across diverse parenting situations. Users are required to complete the first module before gaining access to the other modules. They can then complete as many additional modules as they choose, in their preferred order. Each module was designed to take about 30 minutes to complete and parents had access to the program for 8 weeks. For the purpose of this study, users were encouraged to complete at least the first module and one of the additional topic-specific modules.

Statistical Analyses

Outcomes were analysed using SPSS version 22. The analytic plan used an intent-to-treat approach, including data for all participants who completed pre-assessment and were randomised, regardless of whether they commenced, completed the intervention, or completed the post-assessment or follow-up. An analysis of missing data (including missing data due to participant attrition) revealed that overall 11.09% of values were missing. This included 48% of cases having missing data on one or more variables. Data points were missing completely at random, with Little's MCAR test not reaching significance, χ^2 (96294) = 36155.59, p = 1.000. Multiple imputations (MI) were used to estimate missing values (Schafer & Graham, 2002). In this study, the Markov Chain Monte Carlo method with 100 iterations was used to produce five multiply imputed data sets. MI was carried out at the individual item level separately for primary and secondary parents as well as for each condition. The amount of missing data is as follows: Primary parents intervention group 10.94%, primary parents control group 7.62%, secondary parents intervention group 20.46%, secondary parents control group 7.17%. All dependent variables were included in the imputation process, with age and gender of parent and child, marital status, Internet confidence and frequency of Internet use included as auxiliary variables.

The main analyses focused on outcomes for primary parents. The impact of the intervention was assessed using a number of criteria. The first was the statistical significance of any differences between groups. Intervention effects were analysed using a series of MANCOVAs and ANCOVAs, including pre-intervention levels of the outcome measures as covariates. ANCOVAs were conducted to examine effects on observed negative parent behaviour and observed negative child behaviour. MANCOVAs were conducted on each set of conceptually related dependent variables: parent-reported child behaviour (ECBI Problem and Intensity scales); child adjustment and parent efficacy (CAPES Emotional, Behavioural and Efficacy scales); parenting style (PS Laxness, Over-reactivity and Verbosity scales); behaviour concerns and parent confidence (Problem and Confidence scales); parental anger (PAI Problem and Intensity scales); conflict over parenting (PPC

Problem and Extent scales); parental adjustment (DASS-21 Depression, Anxiety and Stress scales). Significant multivariate effects were followed up with univariate ANCOVAs to determine which variables contributed to the effect. Due to MI, statistical analyses were performed for each imputed data set and means and standard errors were pooled. To the best of the author's knowledge, no consensus has been reached in the field on how to best pool results from F-tests and p-values for multivariate analyses of covariance, so ranges of results across multiply imputed data sets are reported. Pooled results of univariate ANCOVAs were obtained using the procedure suggested by van Ginkel (2014), including the SPSS syntax to adjust the degrees of freedom of the combined results. Effect sizes of the intervention were computed from the mean pre – post change (or pre – follow-up change for maintenance) in the intervention group minus pre – post change (or pre – follow-up change) in the control group, divided by the pooled pre-intervention standard deviation (Morris, 2008). The second criterion was clinical significance, indicating whether participants moved out of the clinical range from pre- to follow-up assessment (Kendall, Marrs-Garcia, Nath, & Sheldrick, 1999). Published clinical cut-offs were used. Finally, reliable change indices (RCI; Jacobson & Truax, 1991) were calculated, assessing whether the effects of the intervention were reliable. RCIs were calculated using the standard deviation of the IUAU group scores at pre-intervention, and published test-retest reliabilities. Evaluations of reliable and clinically significant change were conducted on the pre- to follow-up data on variables with statistically significant maintenance effects. The proportion of reliably and clinically improved participants across the two groups was compared using chi square analyses. Again, ranges across the multiply imputed data sets are reported.

Statistical significance of intervention effects for secondary parents was analysed separately, using the same analytic approach as for primary parents.

Sample size.

The study's target sample size was determined based on the primary outcome variable, child behaviour difficulties, measured by the ECBI. On the basis of previous intervention studies using TPOL or brief, low intensity versions of Triple P delivered face-to-face, it was estimated that a sample of $n = 79$ per group would be needed to detect a medium effect with 80% power at a two-sided 5% significance level. The final sample of $N = 200$ allowed for attrition of 20%.

Results

Preliminary Analyses

Preliminary analyses were conducted to confirm the equivalence of the conditions at pre-test on all outcome and demographic variables, using ANOVA for continuous variables, and chi-square test for categorical variables (see Table 3.1). No significant differences were found between conditions on any variable, indicating that the randomisation resulted in comparable groups on

socio-demographic measures and the intensity of presenting problems. Nevertheless, pre-intervention scores were used as covariates in subsequent analyses to control for any differences. In addition, parents randomised to complete behaviour observations did not differ significantly from parents not selected in regard to demographics, Internet use, reported level of child behaviour difficulties and dysfunctional parenting.
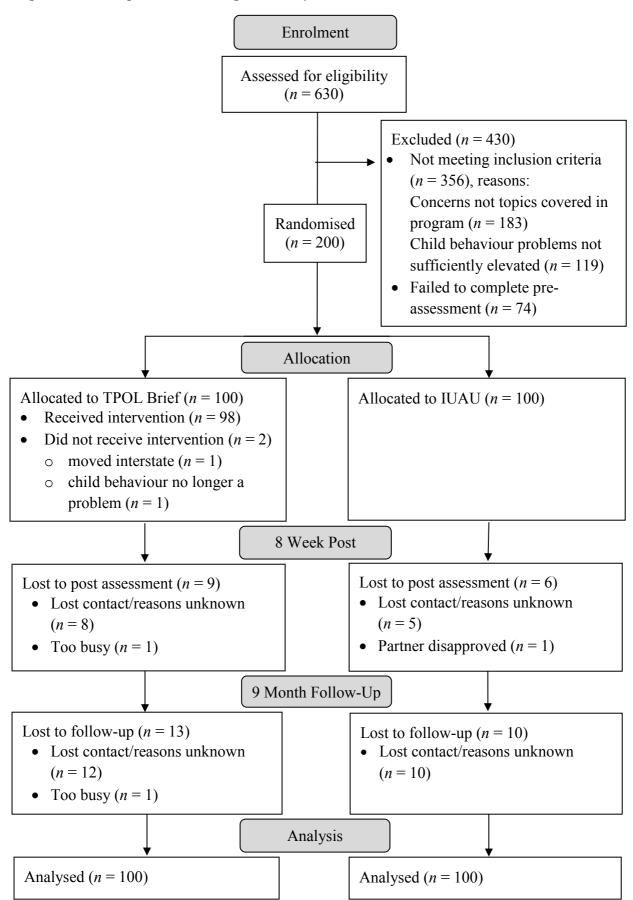
Retention Rates

Figure 3.1 presents the CONSORT diagram of participant flow through the study: 200 families were randomly allocated to TPOL Brief ($n = 100$) or IUAU ($n = 100$). Questionnaire assessment was completed by 185 primary parents (TPOL Brief $n = 91$, IUAU $n = 94$) at post-assessment, representing a retention rate of 92.5%. The 9-month follow-up assessment was completed by 162 participants (81%; TPOL Brief $n = 78$, IUAU $n = 84$). There were no significant differences in the rates of attrition across the two groups at post, $\chi^2 (1) = .649$, $p = .421$, or at follow-up $\chi^2 (1) = 1.170$, $p = .279$. Of the 97 parents that completed the clinic observation procedure at pre-assessment (TPOL Brief $n = 48$, IUAU $n = 49$), 90 (93%) completed it at post-assessment (TPOL Brief $n = 43$, IUAU $n = 47$) and 75 (77%) at follow-up (TPOL Brief $n = 37$, IUAU $n = 38$). For two-parent families, 125 secondary parents completed pre-assessment (TPOL Brief $n = 64$, IUAU $n = 61$). Retention rates for secondary parents were 89% at post-assessment (TPOL Brief $n = 53$, IUAU $n = 58$) and 74% at follow-up assessment (TPOL Brief $n = 39$, IUAU $n = 53$).

Table 3.1 *Demographic Characteristics of the Sample (Primary Parents)*

Variable	TPOL Brief $n = 100$	IUAU $n = 100$	F (1,198)	p
	M (SD)	M (SD)		
Child age (years)	4.57 (1.88)	4.26 (1.93)	1.33	.251
Respondent age (years)	35.74 (5.55)	35.75 (6.25)	<.01	.990
No. of children at home	2.02 (0.83)	2.09 (0.83)	0.36	.551
	n (%)	n (%)	χ^2	p
Child gender			0.73	.394
Male	52 (52)	58 (58)		
Female	48 (48)	42 (42)		
Respondent gender			0.00	1.000
Female	92 (92)	92 (92)		
Male	8 (8)	8 (8)		
Family composition			2.56	.464
Original family	81 (81)	74 (74)		
Step-family	5 (5)	6 (6)		
Sole parent	12 (12)	14 (14)		
Other	2 (2)	6 (6)		
Marital status			0.14	.713
Married/Defacto	83 (83)	81 (81)		
Single/Divorced/Separated	17 (17)	19 (19)		
Years lived in Australia			2.92	.232
Born in Australia	75 (75)	75 (75)		
10 years or more	11 (11)	17 (17)		
2–10 years	14 (14)	8 (8)		
Education			1.65	.438
High school or less	17 (17)	23 (23)		
Trade/Technical college	27 (27)	21 (21)		
University	56 (56)	56 (56)		
Employment			0.26	.879
Full-time	26 (26)	23 (23)		
Part-time	43 (43)	44 (44)		
Not working	31 (31)	33 (33)		
Perceived financial comfort			0.02	.877
Prosperous, very comfortable, reasonably comfortable	71 (71)	70 (70)		
Just getting along, poor	29 (29)	30 (30)		
Internet confidence			1.5	.682
Not confident	0 (0)	1 (1)		
Neutral	3 (3)	3 (3)		
Confident	36 (36)	31 (31)		
Totally confident	61 (61)	65 (65)		

Note. F = univariate ANOVA effect for condition; χ^2 = Pearson's chi-square

Figure 3.1 *Participant Flow through the Study*

Short-term Intervention Effects

Table 3.2 contains descriptive statistics for primary parents for both conditions at pre- and post-intervention, as well as univariate F values and effect sizes (Cohen's d) for all significant condition effects.

Primary outcomes.

Analysis of child behaviour Problem and Intensity scores on the ECBI using MANCOVA revealed no significant condition effect, $F(2,195) = 1.13–1.21$, $p = .299–.324$. MANCOVA revealed a significant condition effect for parenting style on the PS, $F(3,193) = 7.49–8.53$, $p < .001$. Univariate analyses indicated that TPOL Brief parents reported significantly lower use of dysfunctional parenting in each of the Laxness, Over-reactivity and Verbosity domains than IUAU parents. The effect sizes were small to medium.

Secondary outcomes.

No significant multivariate effect was evident for child adjustment and parent efficacy on the CAPES, $F(3,193) = 0.16–0.37$, $p = .777–.921$. There was a significant multivariate condition effect on parent-reported Behaviour Concerns and Parent Confidence, $F(2,195) = 3.41–4.01$, $p = .020–.035$. TPOL Brief parents were significantly more confident in dealing with behaviour problems at post-assessment, compared to IUAU, and the effect was medium. No significant condition effect was evident for observed child negative behaviour, $F(1,86) = 1.83$, $p = .180$, or observed parent negative behaviour $F(1,86) = 2.30$, $p = .133$. The baseline rates per minute of observed disruptive child behaviour and ineffective parenting were low. There was no significant multivariate condition effect for parental anger on the PAI, $F(2,195) = 1.35–1.82$, $p = .164–.261$. Mean scores for both groups were not elevated at pre-assessment. Regarding conflict over parenting for two parent households, there was no significant multivariate effect for condition on the PPC Problem and Extent scales, $F(2,155) = 0.81–1.61$, $p = .203–.446$. Similarly, no condition effects were evident for parents' DASS-21 Depression, Anxiety and Stress scores, $F(3,193) = 1.92–2.38$, $p = .071–.127$. Mean scores for both groups were not elevated at pre-assessment and fell in the normal range.

Table 3.2 *Short-term Effects for Primary Parents*

Measure	TPOL Brief ($n = 100$)				IUAU ($n = 100$)				ANCOVA				
	Pre		Post		Pre		Post						
	M	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*	*F*	*df*	*p*	*d*	95% CI
ECBI Intensity	148.28	2.64	130.73	3.20	144.06	2.69	131.57	2.96	c				
ECBI Problem	18.18	0.67	13.94	0.71	18.31	0.62	14.93	0.70	c				
CAPES Efficacy	122.30	2.54	134.15	3.56	122.50	2.7	132.33	3.10	c				
CAPES Emotional	3.61	0.28	3.27	0.23	3.74	0.27	3.24	0.27					
CAPES Behavioural	35.90	0.97	31.76	1.18	35.23	1.05	30.89	1.06					
PS Laxness	2.95	0.08	2.51	0.07	2.93	0.09	2.71	0.08	8.24	1, 195	.005**	0.26	-0.02 – 0.53
PS Over-reactivity	3.34	0.08	2.90	0.08	3.32	0.09	3.08	0.10	4.94	1, 182	.027*	0.24	-0.04 – 0.52
PS Verbosity	3.90	0.08	3.31	0.08	3.85	0.09	3.73	0.09	21.60	1, 194	<.001***	0.55	0.27 – 0.83
Behaviour concerns	24.19	0.41	20.94	0.39	23.64	0.40	21.16	0.44	1.23	1, 190	.270		
Parent confidence	70.70	1.23	83.59	1.53	72.38	1.62	78.71	1.57	6.67	1, 194	.011*	0.45	0.17 – 0.73
PCPTOS child [a]	0.51	0.08	0.54	0.07	0.68	0.07	0.55	0.06	1.83	1, 86	.180		
PCPTOS parent [a]	0.02	0.01	0.05	0.05	0.07	0.07	0.03	0.03	2.30	1, 86	.133		

Table 3.2 cont'd

Measure	TPOL Brief (n = 100)				IUAU (n = 100)				ANCOVA				
	Pre		Post		Pre		Post						
	M	SE	M	SE	M	SE	M	SE	F	df	p	d	95% CI
PAI Problem	27.80	0.77	26.23	0.80	28.19	0.78	26.09	0.76	c				
PAI Intensity	115.72	2.80	107.34	3.04	113.50	3.39	111.88	3.50					
PPC Problem [b]	6.48	0.45	6.19	0.43	5.63	0.40	5.76	0.40	c				
PPC Extent [b]	38.84	2.09	34.05	1.62	34.85	2.02	34.03	1.82					
DASS Depression	6.44	0.70	4.49	0.48	7.06	0.81	6.19	0.79	c				
DASS Anxiety	3.58	0.51	3.02	0.52	4.08	0.59	4.23	0.64					
DASS Stress	13.88	0.80	11.15	0.68	13.32	0.99	13.37	0.94					

Note. TPOL Brief = Triple P Online Brief, IUAU = Internet-use-as-usual control, Pre and Post = pre- and post-intervention assessment consisting of pooled *M* and *SE* values from multiple imputation data sets, ANCOVA = univariate effect for condition (only reported where the multivariate effect was significant), *d* = Cohen's *d* for pre-test post-test control group designs, PS = Parenting Scale, ECBI = Eyberg Child Behaviour Inventory, CAPES = Child Adjustment and Parent Efficacy Scale, PCPTOS = Parent-Child Play Task Observation System, PAI = Parent Anger Inventory, PPC = Parent Problem Checklist, DASS = Depression Anxiety Stress Scales-21, [a] observed negative child and parent behaviour, rate per minute, complete case analysis only for *n* = 48 (TPOL Brief) and *n* = 49 (IUAU), [b] for two-parent households only, *n* = 81 (TPOL Brief), *n* = 79 (IUAU), [c] multivariate effect not significant, **p* < .05; ***p* < .01; ****p* < .001.

Program Use and Client Satisfaction

  Intervention use.

   Of the 98 parents who began TPOL Brief (i.e. logged on at least once to activate their account), at post-assessment, 62% ($n = 61$) had completed at least the recommended minimum dose of the introductory module plus one additional exemplar module. In addition, 53% completed 3 or more modules, 45% completed 4 or more modules, and 40% completed all 5 modules ($n = 39$). Thirteen per cent had completed the introductory module only, and 25% did not complete any modules, although the majority of users completed some activities within the introductory module. Average module completion time was around 2 hours for the introductory module and 45 minutes for the exemplar modules, which was longer than expected, indicating that parents were exploring optional extra material such as additional video modelling of strategies. Overall, users logged on an average of 6 times (range 0–22) and spent about 228 minutes (range 0–785) on the program. Users that completed all modules logged on an average of 8 times (range 2–19) and spent about 376 minutes on the program (range 228–405).

  Intervention feedback.

   Participants rated the intervention (e.g., topic relevance, content difficulty, clarity of sequence, time required) consistently highly, with an average rating of 4 out of 5. Table 3.5 displays mean ratings for all dimensions of program feedback.

  Client satisfaction.

Parents in the intervention group reported high levels of satisfaction with TPOL Brief as measured by the CSQ, with a mean score of 40.34 out of 56 ($SD = 8.08$). Eighty-eight per cent of participants rated the quality of the service they received as at least 'good' and 77% were at least 'satisfied' with the program. This includes ratings from all primary parents in the intervention group, regardless of whether they completed the program. Fifty-three per cent of parents also indicated that they felt `more positive´ or `much more positive´ towards parenting programs since participating (3% felt more negative), with 72% of participants reporting they were `likely´ or `very likely´ to participate in online parenting support in the future (13% unlikely); and 67% indicating they would be `likely´ or `very likely´ to participate in face-to-face support (12% unlikely).

Long-term Intervention Effects

   Table 3.3 contains descriptive statistics for primary parents for both conditions at pre- and follow-up assessment, as well as univariate F values and effect sizes (Cohen's d) for all significant condition effects.

  Primary outcomes.

   Analysis of ECBI Problem and Intensity scores using MANCOVA revealed a significant condition effect for child behaviour, $F(2,195) = 3.29–3.62$, $p = .029–.039$. Parents in TPOL Brief

reported significantly lower intensity and significantly fewer child behaviour problems than IUAU, with small to medium effect sizes. MANCOVA revealed a significant condition effect for parenting style on the PS, $F(3,193) = 6.25$–8.52, $p < .001$. Univariate analyses indicated that TPOL Brief parents continued to report significantly lower use of dysfunctional parenting in each of the Laxness, Over-reactivity and Verbosity domains than IUAU at follow-up. The effect sizes were small to medium (see Table 3.3).

Secondary outcomes.

MANCOVA on the CAPES was inconclusive, with four out of five imputed datasets showing a significant condition effect from pre-intervention to follow-up, $F(3,193) = 2.37$–4.10, $p = .008$–$.072$. Follow-up univariate analyses indicated that parents receiving TPOL Brief reported higher levels of confidence, with a small effect size. There was a significant condition effect on parent-reported Behaviour Concerns and Parent Confidence, $F(2,195) = 8.87$–10.59, $p < .001$. Intervention group parents reported significantly fewer concerns and were more confident at follow-up assessment, compared to IUAU, with effect sizes being small and medium. Analysis of observed child negative behaviour and observed parent negative behaviour using ANCOVA revealed no significant condition effects, $F(1,71) = 0.54$, $p = .467$ and $F(1,71) = 0.01$, $p = .911$, respectively.

As at post-assessment, there was no significant multivariate effect for condition at follow-up for parental anger on the PAI, $F(2,195) = 0.69$–1.36, $p = .260$–$.505$, conflict over parenting on the PPC Problem and Extent scales, $F(2,155) = 1.50$–2.30, $p = .104$–$.227$ or for parental adjustment on the DASS-21, $F(3,193) = 1.25$–1.68, $p = .172$–$.295$. As noted above, mean scores for both groups on the PAI and DASS-21 were not elevated at pre-assessment and fell in the normal range on these measures.

Clinical Significance of Change

Table 3.4 contains descriptive statistics and χ^2 values for measures of clinically significant change and statistically reliable change across the primary outcome measures. The intervention group showed significantly greater movement from the clinically elevated to nonclinical range for parenting style on the PS Over-reactivity and Verbosity subscales. Condition effects for clinically significant improvement on the PS Laxness subscale and ECBI Intensity scale were inconclusive as the range of p-values for the five multiply imputed datasets included significant as well as non-significant results. There was no group difference for clinically significant change on the ECBI Problem scale. In terms of reliable change, there was a significant intervention effect for the PS Over-reactivity and Verbosity scales only.

Table 3.3 *Long-term Effects for Primary Parents*

| Measure | TPOL Brief (n = 100) | | | | IUAU (n = 100) | | | | ANCOVA | | | | |
| | Pre | | FU | | Pre | | FU | | | | | | |
	M	SE	M	SE	M	SE	M	SE	F	df	p	d	95% CI
ECBI Intensity	148.28	2.64	123.56	2.75	144.06	2.69	130.20	3.01	6.57	1, 193	.011*	0.41	0.13 – 0.69
ECBI Problem	18.18	0.67	13.41	0.75	18.32	0.62	15.30	0.74	3.67	1, 116	.058	0.27	-0.01 – 0.55
CAPES Efficacy	122.30	2.54	144.63	2.96	122.50	2.7	135.87	3.34	4.75	1, 195	.031*	0.34	0.06 – 0.62
CAPES Emotional	3.61	0.28	3.39	0.25	3.74	0.27	3.12	0.26	1.09	1, 50	.301		
CAPES Behavioural	35.90	0.97	29.56	0.98	35.23	1.05	30.19	1.06	0.60	1, 175	.440		
PS Laxness	2.95	0.08	2.44	0.07	2.93	0.09	2.69	0.09	7.31	1, 117	.008**	0.31	0.03 – 0.59
PS Over-reactivity	3.34	0.08	2.88	0.08	3.32	0.09	3.12	0.08	7.23	1, 168	.008**	0.31	0.03 – 0.59
PS Verbosity	3.90	0.08	3.26	0.09	3.85	0.09	3.65	0.08	18.17	1, 171	<.001***	0.51	0.23 – 0.79
Behaviour concerns	24.19	0.41	19.98	0.33	23.64	0.40	20.99	0.51	5.25	1, 124	.024*	0.39	0.11 – 0.66
Parent confidence	70.70	1.23	86.91	1.20	72.38	1.62	78.74	1.82	18.86	1, 184	<.001***	0.68	0.40 – 0.97
PCPTOS child [a]	0.51	0.08	0.33	0.04	0.68	0.07	0.41	0.05	0.54	1, 71	.467		
PCPTOS parent [a]	0.02	0.01	0.02	0.01	0.07	0.03	0.05	0.02	0.01	1, 71	.911		
PAI Problem	27.80	0.77	24.61	0.76	28.19	0.78	26.09	0.80	[c]				

Table 3.3. cont'd

| Measure | TPOL Brief (n = 100) | | | | IUAU (n = 100) | | | | | ANCOVA | | | |
| | Pre | | FU | | Pre | | FU | | | | | | |
	M	SE	M	SE	M	SE	M	SE	F	df	p	d	95% CI
PAI Intensity	115.72	2.80	106.87	2.72	113.41	3.39	107.67	3.05					
PPC Problem [b]	6.48	0.45	6.48	0.39	5.63	0.40	5.27	0.37	c				
PPC Extent [b]	38.84	2.09	34.62	1.61	34.85	2.02	31.50	1.36					
DASS Depression	6.44	0.70	4.70	0.48	7.06	0.81	6.42	0.78	c				
DASS Anxiety	3.58	0.51	3.11	0.41	4.08	0.59	4.49	0.59					
DASS Stress	13.88	0.80	11.46	0.70	13.32	0.99	12.91	0.83					

Note. TPOL Brief = Triple P Online Brief, IUAU = Internet-use-as-usual control, Pre and FU= pre-intervention and follow-up assessment consisting of pooled *M* and *SE* values from multiple imputation data sets, ANCOVA = univariate effect for condition (only reported where the multivariate effect was significant), *d* = Cohen's d for pre-test post-test control group designs, PS = Parenting Scale, ECBI = Eyberg Child Behaviour Inventory, CAPES= Child Adjustment and Parent Efficacy Scale, PCPTOS = Parent-Child Play Task Observation System, PAI = Parent Anger Inventory, PPC = Parent Problem Checklist, DASS = Depression Anxiety Stress Scales-21, ª observed negative child and parent behaviour, rate per minute, complete case analysis for *n* = 48 (TPOL Brief) and *n* = 49 (IUAU), ᵇ for two-parent households only, *n* = 81 (TPOL Brief), *n* = 79 (IUAU), ᶜ multivariate effect not significant, * *p* < .05; ** *p* < .01; *** *p* < .001.

58

Table 3.4 *Clinical and Reliable Improvement at Follow-up Assessment*

Measure	TPOL Brief n/nª (%)		IUAU n/nª (%)		Clinical change		Reliable change	
	Clinically improved	Reliably improved	Clinically improved	Reliably improved	χ^2	p	χ^2	p
ECBI Intensity ≥131	41/75 (55)	38/100 (38)	28/70 (40)	32/100 (32)	2.02–5.10	.024*–.155	0.55–1.08	.298–.460
ECBI Problem ≥15	31/70 (44)	41/100 (41)	24/72 (33)	32/100 (32)	0.42–2.86	.091–.516	0.55–3.09	.079–.460
PS Laxness ≥3.15	28/40 (70)	14/100 (14)	17/37 (46)	13/100 (13)	3.64–5.62	.018*–.056	0.04–0.39	.535–.836
PS Over-reactivity ≥3.05	33/64 (52)	22/100 (22)	20/62 (32)	8/100 (8)	4.03–6.53	.011*–.045*	4.39–11.66	.001**–.036*
PS Verbosity ≥4.05	30/43 (70)	28/100 (28)	16/41 (39)	11/100 (11)	5.72–10.68	.001**–.017*	5.38–11.50	.001**–.020*

Note. TPOL Brief = Triple P Online Brief, IUAU = Internet-use-as-usual control, Clinically improved =moved from clinical into nonclinical range; Reliably improved = Reliable Change Index > 1.96; χ^2 =Pearson's chi-square, range across multiply imputed data sets; PS = Parenting Scale; ECBI = Eyberg Child Behaviour Inventory, [a] *n* for denominator represents the number of participants in the clinical range at pre-intervention, *p < .05; **p < .01.

Dosage Effects

Parents who completed minimum dose (introductory module plus one exemplar module) differed from parents who did not on a number of variables at pre-assessment: Completers reported lower levels of conflict over parenting at pre (PPC Problem $F(1,79) = 5.85$, $p = .018$; and PPC Extent $F(1,79) = 9.95$, $p = .002$) and their children were significantly younger $F(1,98) = 6.50$, $p = .012$.

At follow-up assessment there was a multivariate condition effect for parent-reported Behaviour Concerns and Parent Confidence, $F(4,390) = 4.66–5.86$, $p< .001–.001$, with both subscales contributing to the effect: concerns $F(2,83) = 3.14$, $p = .048$ and confidence $F(2,189) = 9.46$, $p < .001$. Contrasts revealed a significant difference between TPOL Brief minimum dose and IUAU for concerns $p = .030–.214$ and confidence $p < .001$, and between TPOL Brief less than minimum dose and IUAU for concerns $p =.005–.065$ and confidence $p=.001–.002$. Multivariate analysis of the CAPES was inconsistent across the MI data sets, $F(6,386) = 1.71–2.25$, $p = .038–.118$. Univariate ANCOVAs were examined and revealed no significant condition effects on the subscales: Behavioural $F(2,151) = 0.40$, $p = .668$, Emotional $F(2,43) = 0.90$, $p = .415$, Efficacy $F(2,193) = 2.94$, $p=.055$.

There was a significant multivariate condition effect for the PS $F(6,386) = 3.35–4.95$, $p<.001–.003$, univariate ANCOVAs indicated effects on all three subscales: Laxness $F(2,116) = 4.10$, $p =.019$, Verbosity $F(2,94) = 9.06$, $p < .001$, Over-reactivity $F(2,136) = 4.26$, $p = .016$. Planned contrasts revealed that TPOL Brief participants that completed minimum dose or more reported significantly lower scores on all three subscales compared to IUAU: Laxness $p < .001–.010$; Over-reactivity $p = .033–.105$; Verbosity $p < .001–.003$. Participants that completed less than minimum dose differed significantly from IUAU on Over-reactivity $p = .001–.012$ and Verbosity $p < .001$, but not on Laxness $p = .062–.271$.

There was no multivariate effect for the ECBI ($F(4,390) = 1.65–1.94$, $p =.102–.161$), PCPTOS child ($F(2,70) = 2.20$, $p =.119$), PCPTOS parent ($F(2,70) = 0.10$, $p =.908$), PAI ($F(4,390) = 1.19–1.78$, $p = .133–.314$), PPC ($F(4,310) = 0.98–1.35$, $p =.253–.420$) or the DASS-21 ($F(6,386) = 0.68–0.97$, $p =.448–.662$).

Behaviour Concerns and Parent Confidence across Targeted and Non-Targeted Settings

To investigate whether parents' child behaviour concerns and confidence in dealing with problems changed differentially for topics that were targeted by the intervention vs. topics not specifically addressed by the program, targeted (disobedience, fighting and aggression, shopping, self-esteem) and non-targeted behaviours and settings (tantrums, meal times, bed times, separation, school and childcare problems, friends, homework) were combined into two subgroups and mean problem and confidence scores were examined their mean problem and confidence scores. At pre-intervention, TPOL Brief and IUAU did not differ significantly in their problem and confidence scores; and both groups reported higher problem scores and lower confidence scores for the behaviours targeted by the intervention. This was expected as parents needed to have concerns in at least one of the targeted areas to be eligible to participate in the study.

Comparing TPOL Brief and IUAU in regard to the targeted topics, there was a significant multivariate condition effect at post-assessment $F(2,195) = 4.27 – 5.06$, $p = .007 – .015$ and again at follow-up $F(2,195) = 7.37 – 10.35$, $p < .001 – .001$. Univariate ANCOVAs showed that TPOL Brief reported significantly higher confidence for the targeted topics at post $F(1,193) = 8.36$, $p = .004$ ($d = 0.66$) and at follow-up $F(1,179) = 14.53$, $p < .001$ ($d = 0.85$). There was no significant difference for behaviour concerns at post $F(1,168) = 0.38$, $p = .539$ or follow-up $F(1,71) = 0.81$, $p = .370$. For the non-targeted topics there was no significant multivariate condition effect at post-assessment $F(2,195) = 2.17 – 2.69$, $p = .070 –.117$, but at follow-up $F(2,195) = 8.11 – 9.16$, $p < .001$. TPOL Brief reported lower intensity of behaviour concerns $F(1,179) = 7.08$, $p = .009$ ($d = 0.39$) and higher confidence $F(1,186) = 16.76$, p $< .001$ ($d = 0.60$), compared to IUAU.

Outcomes for Secondary Parents

Preliminary analyses confirmed the equivalence of the conditions at pre-test on all outcome and demographic variables, except for PS Laxness and PPC Extent, with TPOL Brief participants reporting higher scores on both. Pre-intervention scores of dependent variables were used as covariates in subsequent analyses to control for any differences.

MANCOVAs and ANCOVAs revealed no significant condition effects at post-assessment on any measure: ECBI ($F(2, 120) = 0.59 – 0.78$, $p = .462 – .556$), CAPES ($F(3, 118) = 0.73 – 1.19$, $p = .318 – .537$), PS ($F(3, 118) = 1.17 – 1.83$, $p = .146 – .325$), Behaviour Concerns and Parent Confidence ($F(2, 120) = 1.58 – 1.89$, $p = .156 – .210$), PAI ($F(2, 120) = 0.60 – 0.76$, $p = .469 – .549$), PPC ($F(2, 118) = 1.48 – 2.12$, $p = .124 – .233$), DASS-21 ($F(3, 118) = 0.16 – 0.58$, $p = .628 – .920$).

Table 3.6 shows means, standard errors and univariate ANCOVA results at follow-up assessment. There was a significant multivariate condition effect on the PPC, $F(2, 118) = 3.27 – 4.37$, $p = .015 – .042$, with TPOL Brief secondary parents reporting significantly lower extent of

conflict over parenting. The effect size was medium. There was no significant multivariate condition effect for the ECBI ($F(2, 120) = 0.27 – 0.55$, $p = .579 – .767$). A number of results were inconclusive as the ranges across MI data sets included both significant and non-significant p-values for the MANCOVAs on CAPES, PS, Behaviour Concerns and Parent Confidence, PAI and DASS-21. Therefore, univariate ANCOVAs were examined for those measures, which revealed that TPOL Brief participants reported significantly lower scores on CAPES Behavioural subscale, PS Over-reactivity; Behaviour concerns and the PAI Extent, with small to medium effect sizes. There were no significant univariate effects for the DASS-21.

Table 3.5 *Mean Ratings of Program Feedback*

Feedback dimension		M (SD) n=83
On each of the following dimensions, please indicate your ratings of TPOL Brief:	*1 = Strongly disagree to 5 = Strongly agree*	
The level of difficulty of the content was appropriate.		4.00 (0.75)
The organisation and sequence of the content was clear.		4.20 (0.56)
The module topics were helpful and relevant to me.		4.16 (0.80)
The time required to complete the modules was reasonable.		3.81 (0.89)
The length of the video clips was appropriate.		3.88 (0.86)
The activities were personalised and relevant to me.		3.83 (0.84)
Please rate the online program in the following areas:	*1 = Very poor to 5 = Very good*	
Overall appearance of the site (e.g. design, layout, colours etc.)		4.15 (0.68)
Navigation		4.16 (0.69)
Quality of video clips		4.22 (0.66)
Interactivity/level of engagement		4.02 (0.75)
Please rate the usefulness of the resources provided: [a]	*1 = Not at all helpful to 5 = Very helpful*	
Workbook		3.91 (0.99)
Worksheets		3.87 (1.01)
Podcast		3.78 (1.15)
Activity extras- show me more (clips, worksheets, hints)		3.97 (1.01)

Note. [a] Reduced *n* due to additional option 'don't know/did not use': workbook *n* = 70, worksheets *n* = 72, podcast *n* = 50, activity extras *n* = 71

Table 3.6 *Long-term Intervention Effects for Secondary Parents*

Measure	TPOL Brief n = 64				IUAU n = 61				ANCOVA				
	Pre		FU		Pre		FU						
	M	SE	M	SE	M	SE	M	SE	F	df	p	d	95% CI
ECBI Intensity	135.22	3.08	119.13	2.46	126.98	3.76	118.11	4.19	[b]				
ECBI Problem	14.70	1.04	12.69	0.77	14.04	1.13	12.01	1.17	[b]				
CAPES Efficacy	136.10	3.72	142.94	4.29	139.45	3.94	146.05	3.99	0.13	1, 119	.721		
CAPES Emotional	2.89	0.28	2.60	0.23	2.93	0.31	2.92	0.29	0.87	1, 95	.353		
CAPES Behavioural	31.28	1.09	25.59	0.94	29.33	1.31	28.17	1.37	7.14	1, 116	.009**	0.47	0.12–0.83
PS Laxness	2.93	0.12	2.56	0.08	2.60	0.10	2.64	0.10	3.80	1, 84	.055		
PS Over-reactivity	3.16	0.12	2.94	0.09	2.90	0.11	3.04	0.11	4.29	1, 59	.043*	0.39	0.04–0.74
PS Verbosity	3.94	0.10	3.77	0.10	3.72	0.10	3.71	0.10	0.03	1, 92	.869		
Behaviour concerns	22.00	0.48	19.33	0.48	21.64	0.55	20.52	0.68	4.19	1, 73	.044*	0.38	0.03–0.73
Parent confidence	77.72	1.93	82.55	2.09	77.77	2.44	80.15	2.28	0.67	1, 103	.415		
PAI Problem	25.94	1.09	23.54	0.73	24.40	1.14	22.41	1.17	0.13	1, 112	.724		
PAI Intensity	105.38	3.57	98.91	3.26	102.34	4.30	106.81	4.52	4.64	1, 110	.033*	0.35	<-0.01–0.70
PPC Problem [a]	6.24	0.47	4.94	0.38	5.36	0.48	4.98	0.49	0.81	1, 110	.370		
PPC Extent [a]	35.97	1.69	30.04	1.41	31.20	1.61	32.40	1.78	7.09	1, 115	.009**	0.55	0.19–0.69

Table 3.6 cont'd

Measure	TPOL Brief n = 64				IUAU n = 61				ANCOVA				
	Pre		FU		Pre		FU						
	M	SE	M	SE	M	SE	M	SE	F	df	p	d	95% CI
DASS Depression	5.16	0.86	3.97	0.61	4.56	0.77	5.49	0.96	3.53	1, 84	.064		
DASS Anxiety	2.50	0.40	2.68	0.42	1.80	0.39	2.52	0.48	0.12	1, 48	.736		
DASS Stress	10.56	0.90	9.16	0.76	9.08	0.88	10.06	0.99	2.43	1, 84	.123		

Note. TPOL Brief = Triple P Online Brief, IUAU = Internet-use-as-usual control, Pre and FU= pre and follow-up intervention assessment consisting of pooled *M* and *SE* values from multiple imputation data sets, ANCOVA = univariate effect for condition (only reported where the multivariate effect was significant), *d* = Cohen's d for pre-test post-test control group designs, PS = Parenting Scale, ECBI = Eyberg Child Behaviour Inventory, CAPES= Child Adjustment and Parent Efficacy Scale, PAI = Parent Anger Inventory, PPC = Parent Problem Checklist, DASS = Depression Anxiety Stress Scales-21, ᵃ for two-parent households only, n = 64 (TPOL Brief), n = 59 (IUAU), ᵇ multivariate effect not significant, *p < .05; **p < .01; ***p < .001.

Discussion

The findings of this study extend previous research indicating that self-directed parenting interventions delivered via the Internet can be effective at improving parenting for families with early onset child behaviour difficulties, with a delayed impact on child behaviour problems. This research provides empirical support for the efficacy of a brief, low intensity online version of the Triple P – Positive Parenting Program. In line with the hypotheses, use of TPOL Brief was associated with significantly lower dysfunctional parenting, and greater parental confidence in dealing with problem behaviour (four out of five self-report measures at post-assessment and all five measures at 9-month follow-up) and lower parent-reported child behaviour problems (three out of five self-report measures at follow-up), compared to IUAU. Effect sizes were small to medium. Interestingly, improvements in child behaviour concerns and parent confidence were initially only reported in areas targeted by the program, but at follow-up also in additional topic areas not specifically addressed by the program. Effect sizes for parent confidence for targeted behaviours were larger than for the non-targeted behaviours ($d = 0.85$ vs. $d = 0.60$, respectively). However, a decrease in the number of child behaviour concerns was only seen for non-targeted areas. This shows that behaviour change was not limited to areas that were trained specifically, but was generalised across behaviours and settings over time.

Contrary to predictions, no significant improvements were evident for observed parent or child behaviour, parental adjustment or anger. However these were in the normal range pre intervention, creating a floor effect. The intervention also did not improve conflict over parenting for primary parents.

Encouragingly, some improvements were evident for secondary parents at follow-up even though the majority of them did not actively participate in the intervention. Similar to primary parents, secondary parents (of whom 88% were fathers) reported significantly less child behaviour problems (CAPES Behaviour subscale and Behaviour concerns) and lower scores on PS Over-reactivity. However, in contrast to primary parents, secondary parents also reported lower intensity of anger and less conflict over parenting, with small to medium effect sizes. Unfortunately the program tracking and assessment provided only limited information on the secondary parents' program involvement. Seventeen per cent of primary parents in the current study reported completing modules with someone else (e.g., partner, friend) and a few ($n = 8$) secondary parents requested their own personal login codes, therefore, secondary parent level of involvement overall cannot be determined with certainty. Future research should capture in more detail which modules each family member completes and to what extent the secondary parent is involved in practising the parenting strategies, so a distinction can be made whether changes reported by the secondary parent are due to them participating, even if only in part, alongside the primary parent, or if changes at a

family level can be achieved irrespective of secondary parent involvement. In support of the later argument, Dittman et al. (2014) found that father participation was not a significant predictor of either maternal or paternal outcomes in a trial of TPOL.

Consumer feedback regarding design and usability of the program was positive and client satisfaction was high. Despite the positive feedback, 38% of participants did not complete the recommended minimum dose of the introductory module plus one exemplar module. Despite having three less modules than a previously tested, more intensive version of Triple P Online (Sanders, Baker, et al., 2012), completion rates for all modules were not increased (43% for TPOL, 40% for TPOL Brief). It is important to bear in mind that TPOL Brief is a narrow focus program of low intensity that is aimed at parents with a few specific concerns about child behaviour rather than families that require broad focus, intensive parenting skills training. Since parents are encouraged to complete the modules that are relevant to them and correspond with their current areas of concern, it is not necessarily recommended for a family to complete all modules. However, a higher rate of completion of minimum dose would be desirable. Minor differences in outcome were found in regard to whether or not participants had completed the minimum recommended dose of the program. All intervention participants, regardless of dose reported lower child behaviour concerns and higher confidence in dealing with them, as well as lower scores on Over-reactivity and Verbosity compared to IUAU. Participants that completed at least minimum dose additionally reported significantly lower Laxness compared to IUAU, indicating that for some parenting strategies additional examples or practice may be required to create behaviour change. This lends some support to the idea that although increased engagement with the program and completion of more modules may lead to better outcomes, even the completion of small parts of the program (less than two modules) can bring significant improvements. This raises the question about what the crucial parts of the intervention are and what is the minimally sufficient dose to achieve positive outcomes. If this type of intervention could be truncated into even smaller parts, it would for example lend itself to delivery as a topic specific parenting app on a smart phone.

Nevertheless, further research should investigate what variables predict module completion and how parents can be encouraged to engage with the intervention at a level that maximises their benefits. One possible reason for the low completion rate could be that parents are initially interested in the format of an online intervention because it seems more convenient than many other options and is attractive, particularly if it is available at a low cost (or in this study free as part of a research project). It is comparatively easy to 'opt in' as there is no immediate requirement for action or commitment to participate in a face-to-face program at any particular time. Anecdotal evidence from this trial suggests that participants often do not actively 'opt out' of the program or decide not to participate further. They begin the program and have intentions to continue at another time, but

do not follow through before the period of access expires. The completely self-directed nature of the program requires a high level of self-motivation and commitment that parents may underestimate initially. Self-directed online programs like TPOL Brief give the user more autonomy, which means parents must take responsibility for the management of their progress. Further research should investigate strategies that lead to higher retention and engagement in online interventions. For example, a higher level of self-efficacy has been linked to increased program adherence in online programs (Wangberg, 2008), so incorporating more strategies that increase parental self-efficacy in regard to program completion could be beneficial. In addition, incorporating more alert-based functions into the program (e.g., short summaries, tips and reminders via phone or email) could be beneficial as they have been shown to improve retention as well as outcome in e-mental health interventions (Whitton et al., 2015).

Overall, the effects on child problem behaviour ($d =.27– .41$) and dysfunctional parenting ($d =.31– .51$) were smaller than those seen for TPOL ($d =.78$ and $d =.42$, respectively) or for Level 3 Triple P programs delivered face-to-face (child behaviour problems $d =.61$, dysfunctional parenting $d =.46$) (Sanders, Kirby, et al., 2014). Nevertheless, the use of such a brief, cost-efficient intervention format as part of a comprehensive population level approach can still be beneficial, as even small effect sizes are meaningful on a population level. The brevity of the program could increase initial uptake, as parents may perceive such a short intervention as something manageable that they can fit into their lives. This minimally sufficient approach to online parenting support, where parents can access as much or as little as they need, makes participation more time-efficient and could result in greater adoption of parenting programs. For example, parents with lower levels of problems or who are seeking to prevent problems may benefit from completing just a few modules of TPOL Brief. In turn, parents that experience more entrenched problems in several areas may need to complete more exemplars or a more intensive version of the program (TPOL), possibly enhanced by therapist support in person, via telephone or online.

Limitations

The results of the study need to be interpreted in the context of the somewhat low reliability of the Behaviour Concerns and Parent Confidence Scale, and the Verbosity subscale of the Parenting Scale. In addition, the CAPES measure has only been recently developed and limited information is available regarding discriminant and convergent validity. Patterns of relationships between CAPES and other measures assessing similar and different constructs still need to be established.

In addition, even though a concerted effort was made to recruit in suburbs identified as low-SES, low-income or otherwise disadvantaged, these families are underrepresented. Participants had higher than average education, which may reduce the ability to generalise the results to higher-risk

samples. Additionally, the study may have been underpowered to detect changes in behaviour observations as clinic visits could only be carried out for half the sample and the base rates for observed negative child behaviour and ineffective parenting strategies were very low, suggesting floor effects were operating.

In addition, there was a large range regarding module completion times. Estimating the exact amount of time parents engaged with the program is difficult as it is not possible to detect whether parents are actively using the website or just have it open until it times out. More sophisticated tracking mechanisms would enable clearer conclusions to be drawn regarding minimally sufficient dose and true differences in program use amongst participants.

Conclusions

Brief online self-administered parenting interventions can be an effective and cost-effective addition to more intensive programs and a valuable component of a public health approach. Further research should investigate the minimally sufficient dose needed to achieve positive outcomes and explore strategies to increase retention.

CHAPTER 4:
PREDICTORS OF PROGRAM USE AND CHILD AND PARENT OUTCOMES OF A
BRIEF ONLINE PARENTING INTERVENTION

Background

Parenting interventions have long been recognised as one of the methods of choice for the prevention and treatment of child behaviour problems (Eyberg, Nelson, & Boggs, 2008). In recent years, online parenting interventions have received increasing attention as they have considerable potential for increasing reach and uptake of programs among families that face barriers to accessing more 'traditional' face-to-face programs (Breitenstein et al., 2014; Jones et al., 2013; Nieuwboer et al., 2013a). The number of evidence-based online parenting programs available for children with behaviour problems is still very limited, but research has shown their effectiveness in improving parenting and child behaviour (e.g., Enebrink et al., 2012; Sanders, Baker, et al., 2012). A caveat that has emerged from recent trials is that there is often considerable attrition, as well as high variability in the use of such programs and in achieved outcomes for families. This variability can be harnessed to help understand who uses programs in what way, and assist better targeting of interventions to parents that are most likely to benefit. It may also assist the development of support strategies for families who might not benefit as much from online programs in their current format. If we could identify basic, easily assessable parent, child and family characteristics that may impact intervention effects (e.g., age, gender, education, single-parenthood), it would enable us to recommend a particular type of intervention to a particular type of family. Aligning interventions closer with user characteristics could in turn lower dropout rates and increase benefits.

The present study aims to identify predictors of program use and outcomes of a recently developed brief online version of the Triple P – Positive Parenting Program (TPOL Brief), with a particular focus on child and parent demographic characteristics. TPOL Brief is a 5-module low-intensity parenting intervention that aims to promote the use of positive parenting strategies and reduce child behaviour problems. Using data from a randomised controlled trial investigating the effectiveness of TPOL Brief (see Chapter 3), secondary analyses were conducted to identify socio-demographic, parent and child related as well as program related variables associated with greater module completion and improved treatment outcome.

To the best of the author's knowledge, studies of predictors of program use and treatment outcome have been conducted almost exclusively on face-to-face programs (O'Brien & Daley, 2011), as web-based programs are a recent addition to the suite of services offered to parents. Therefore the current study approach is exploratory and predominantly guided by the literature on predictors in face-to-face parenting interventions.

Previous research points to a variety of factors that can be associated with a family's level of engagement in parenting interventions (online or face-to-face), and their achieved treatment outcomes. For example, program effects might differ as a function of demographic characteristics of the child or parent, as a function of more substantive characteristics like parental or child behaviour, adjustment or mental health, or because of characteristics of the program itself or the way in which it is used.

Let us first consider the evidence for the influence of parent and child demographic characteristics. Results regarding child factors like age and gender as potential predictors of intervention outcomes are inconclusive. Early child behaviour problems have been shown to be stable over time (Campbell, Shaw, & Gilliom, 2000). Therefore, older child age could mean that problems are more entrenched and harder to change through intervention. Male gender is also a marker for the severity of conduct problems, with conduct problems being three to four times more likely to be present in boys than girls (Burke et al., 2002). Hence, male gender could also influence parent training effectiveness. Although these factors have been associated with poorer outcomes in some studies (Nowak & Heinrichs, 2008), there were no decreased intervention effects in others (Beauchaine, Webster-Stratton, & Reid, 2005; Gardner et al., 2010).

Socio-demographic factors of the parents, such as age, gender, marital status and education, have failed to emerge as consistent predictors of engagement in online programs (e.g., a review of health-related computer-based systems, Or & Karsh, 2009). At the same time, these factors have been found to influence outcomes in traditional parenting programs. Numerous studies, including two meta-analyses (Lundahl et al., 2006; Reyno & McGrath, 2006) suggest that children of disadvantaged parents, including those with depression, low income, and single parents, show poorer intervention outcomes compared to those facing less adversity. A more differentiated picture emerges from a meta-analysis by Leijten (2013), who showed that both disadvantaged and non-disadvantaged samples benefit equally when initial problem behaviours are severe. However, disadvantaged samples show less immediate improvement when initial problem severity is low. Regardless of baseline problem severity, disadvantaged samples also experience more difficulties maintaining positive outcomes at 1-year follow-up. Accordingly, the extent of problems at baseline seems to be another factor to consider.

Research supports the idea that families with higher levels of problems at baseline benefit as much (if not more) from parenting interventions as families with lesser problems. Several studies and meta-analyses indicate that families who report higher levels of baseline child behaviour problems also report greater improvements from parenting interventions (e.g., Chamberlain et al., 2008; Lavigne et al., 2008; Sanders, Kirby, et al., 2014). However, in most of these studies, families displaying fewer problems at pre-intervention still had fewer problems at post- and follow-up

assessment. This means that although families with greater initial problems improve more, they still don't catch up to the families displaying fewer problems at baseline. In addition, there is support for the opposing hypothesis that more severe externalising behaviour problems are stable over time and more resistant to change (e.g., Kazdin & Wassell, 2000). One of the very few studies examining moderators of an online parenting program also found that children with conduct problems in combination with high levels of callous-unemotional traits (reduced empathy, remorselessness, and shallow affects) were less responsive to the Internet-based PMT-intervention, compared with children with conduct problems and low levels of callous-unemotional traits (Hogstrom, Enebrink, & Ghaderi, 2013).

Children with more severe behaviour problems are more difficult to parent. Parents often identify their behaviour as frustrating or anger provoking. This frustration can be intensified when parents lack the parenting skills to deal with the misbehaviour effectively (Dix, 1991). Increased frustration and anger puts parents at higher risk for the use of ineffective, coercive and harmful parenting strategies (Kolko, 1996). Since parental anger responses may follow or be intensified by more severe child behaviour problems, they could also play a role in treatment outcomes.

Another factor to be considered is inter-parental conflict. Conflict over parenting has been associated with externalising behaviour problems (Jouriles, Pfiffner, & O'Leary, 1988; Miller, Cowan, Cowan, Hetherington, & Clingempeel, 1993) and aggression (Hall, Zubrick, Silburn, Parsons, & Kurinczuk, 2007) in pre-schoolers. Parents that have frequent disagreements over parenting may struggle to complete and implement a parenting program together, which could in turn impact intervention outcome. However, in a study by Dittman et al. (2014), neither parental anger nor inter-parental conflict emerged as significant predictors of outcome in an online parenting program, despite correlating significantly with levels of child behaviour problems and dysfunctional parenting at post-intervention.

To date, very little is known about the influence of program characteristics on parenting program effectiveness. Research suggests that a greater dosage of an online program is associated with increased behaviour change. This seems true for online parenting interventions (Dittman et al., 2014) as well as other health interventions, (e.g., interventions targeting voluntary health behaviors, Cugelman et al., 2011). However, as online interventions typically have higher attrition than face-to-face programs (Eysenbach, 2005; Melville et al., 2010), ensuring that users receive a sufficient dose of the intervention can be a challenge. Users may be more likely to benefit from online interventions if they have prior experience with web-based programs or feel comfortable using the Internet (Carey et al., 2008). The actual design of the intervention, its components and its features can potentially also influence intervention use and outcome. However, to the best of our knowledge,

no research has been published that investigates the relationship between these aspects of online parenting programs and their effectiveness.

The aim of the current study is to examine if socio-demographic characteristics of the family, along with other variables, can predict: 1) completion of the minimal recommended dose of TPOL Brief, a low intensity online parenting program; and 2) improvements in child behaviour and parenting at follow-up. Given the current lack of data on Internet-based parenting programs, an exploratory approach was employed that included a wide range of potential predictors: 1) child and parent demographics, including age, gender and indicators of disadvantage; 2) baseline levels of child behaviour problems, dysfunctional parenting and parental adjustment difficulties; and 3) program related variables, such as number of completed modules.

Method

Participants

Participants were 100 Australian parents with a 2–9-year-old child ($M = 4.57$, $SD = 1.88$) with elevated levels of disruptive behaviour (75% in the clinical range on the ECBI Intensity scale). Table 4.1 shows the demographic characteristics of the sample. Most children (81%) lived with their two biological or adoptive parents. Participants were mainly mothers (92%), living with a partner (married or de facto 83%). Their mean age was 35.74 years ($SD = 5.55$). The majority were working part-time (43%). Approximately half the sample was university educated (56%). Twenty-nine per cent of the sample identified as poor or only just getting along financially. All participants reported accessing the Internet every day (96%) or several times a week (4%) and the vast majority was confident or totally confident using the Internet (97%). Seventy-two per cent of families had never accessed a parenting program (on or offline) before enrolling in TPOL Brief.

Recruitment

Recruitment was conducted in the greater Brisbane area, in Queensland, Australia. The main recruitment sources were schools and childcare centres, as well as non-profit agencies that serve ethnic and racial minorities. Parents self-identified as having difficulties with their child's disruptive behaviour. Eligibility criteria were: 1) a 2–9-year-old child for whom parents reported elevated levels of child behaviour problems as measured by the Strengths and Difficulties Questionnaire (Goodman, 1999); 2) parents identified at least one of four topics covered in the program (i.e. disobedience, fighting and aggression, going shopping, self-esteem) as an area of concern; 3) access to a computer and broadband Internet connection; and 4) the parent's ability to read English at Year 5 level. Families were excluded if the child or parents had a developmental disability, or if the parents were currently receiving psychological help, counselling or seeing a professional for the child's behaviour difficulties.

Measures

    Demographics.

Demographic information collected at pre-intervention assessment included parents' and children's age and gender, family composition, parent marital status, education, employment, cultural background, and financial comfort. Parents also completed questions about their confidence and frequency of use of the Internet.

    Child behaviour.

The *Eyberg Child Behaviour Inventory* (ECBI; Eyberg & Pincus, 1999) is a 36-item measure of perceptions of disruptive behaviour in children aged 2–16 years. It includes a measure of the frequency of disruptive behaviours (Intensity scale) rated on a 7-point scale, and a measure of the number of behaviours that parents identify as a problem (Problem scale). Higher scores indicate greater child behaviour problems. Both scales had good internal consistency in this sample ($\alpha = .88$ and $\alpha = .85$ respectively).

    Parenting.

The *Parenting Scale* (PS; Arnold et al., 1993) is a 30-item questionnaire that measures three dysfunctional discipline styles: Laxness (permissive discipline), Over-reactivity (authoritarian discipline, anger, meanness and irritability) and Verbosity (long reprimands or reliance on talking), with higher scores indicating more dysfunctional parenting practices. Items are rated on a 7-point scale with the most and least effective parenting strategy being the anchors. Internal consistency for the Total Scale for the current sample was $\alpha = .82$.

    Parental anger.

The *Parental Anger Inventory* (PAI; Sedlar & Hansen, 2001) assesses anger experienced in response to misbehaviour in children aged 2–12 years. Parents rate 50 child-related situations as problematic or not (Problem score), and the degree of anger evoked by each situation on a scale from 1 = *Not at all* to 5 = *Extremely* (Intensity score), with higher scores indicating greater problems and more intense anger. The Problem and Intensity scales showed good internal consistency ($\alpha = .87$ and $\alpha = .94$, respectively) in the current sample.

    Conflict over parenting.

Parents in two-parent households completed the *Parent Problem Checklist* (PPC; Dadds & Powell, 1991). This 16-item questionnaire measures inter-parental conflict over child rearing (e.g., the extent to which parents disagree over rules and discipline, have open conflict over parenting issues, and undermine each other's relationship with their children). The PPC yields an index of the number of problems (Problem scale), and an intensity rating for the problems listed (Extent scale). Both subscales had good internal consistency in this sample ($\alpha = .85$ and $.93$, respectively).

Table 4.1 *Demographic Characteristics of the Sample*

Variable	M	SD
Target child age (years)	4.57	1.88
Respondent age (years)	35.74	5.55
No. of children at home	2.02	0.83
	n	% of *n* = 100
Child gender		
Male	52	52
Female	48	48
Marital status		
Married, cohabiting	83	83
Divorced/Separated	8	8
Single	9	9
Parental status		
Mother (Biological/Adoptive/Step-mother)	92	92
Father (Biological/Adoptive/Foster)	8	8
Education level		
Some high school	5	5
Completed high school	12	12
Trade/Technical college qualification	27	27
University degree	32	32
Postgraduate degree	24	24
Migration background		
Born in Australia	75	75
Lived in Australia 10 years or longer	11	11
Lived in Australia 2-10 years	14	14
Employment		
Full-time	26	26
Part-time	43	43
Not working	31	31
Experienced financial hardship		
Yes	22	22
No	78	78

Parental adjustment.

The short form of the *Depression Anxiety Stress Scales* (DASS-21; Lovibond & Lovibond, 1995) was used to assess symptoms of depression, anxiety, and stress. Parents indicate the extent to which each item applied to them over the past week, on a scale from 0 = *Did not apply to me at all* to 3 = *Applied to me very much, or most of the time*, with higher scores indicating poorer adjustment. The internal consistency of the Total scale in this sample was $\alpha = .93$.

Program related factors.

A variety of program related factors were also assessed: 1) the number of modules completed out of five; 2) per cent of program pages and activities completed out of 128; and 3) completion of minimum dose (defined as completion of the introductory module plus at least one of the exemplar modules).

Outcome measures. The dependent variables in this study were:

1. *Completion of minimum dose,* defined as finishing the introductory module plus at least one of the additional exemplar modules.

2. *Change in child behaviour,* defined as the difference in pre-treatment ECBI Intensity scores and those at follow-up assessment. Positive change scores indicate symptom improvement, with higher scores suggesting more change.

3. *Change in dysfunctional parenting,* defined as the difference in pre-treatment PS Total scores and those taken at follow-up assessment. Positive change scores indicate improvement in parenting style, with higher scores suggesting more change.

The same pattern of results emerged when using absolute scores at follow-up instead of change scores as the criterion variables, so results for change scores are presented.

Procedure

This project followed the National Health and Medical Research Council's ethical guidelines for participation of human subjects and received ethical approval from The University of Queensland Social and Behavioural Sciences Ethical Review Committee (project number: 2012000161). The randomised controlled trial was registered with the Australian New Zealand Clinical Trials Registry (ANZCTR) (ID: ACTRN12613000025730). Informed consent was obtained from all participating families. Eligible parents completed pre-intervention assessment and were randomised to either the intervention group who received access to TPOL Brief, or an Internet-use-as-usual control group. Both groups were then assessed at 8-weeks post intervention and 9-months follow-up. For the purpose of the current study, pre- intervention and follow-up assessment data was used for the intervention group sample.

Intervention

TPOL Brief (Turner & Sanders, 2013) is a low intensity, self-administered online parenting program that aims to promote positive parenting practices, including the use of teaching strategies, antecedent strategies to avoid problems in high-risk situations, positive attention and praise to encourage desirable child behaviour, and effective discipline for misbehaviour. Users receive personal log in details to the 5-module intervention and complete the program by themselves at their convenience. For the initial efficacy trial of the intervention users received access for 8 weeks and were encouraged to complete at least the first module and one of the additional topic-specific modules. The first module introduces positive parenting strategies and makes parents aware of parent traps. The remaining modules focus on exemplars of behaviour-specific (Disobedience, Fighting and aggression, Self-esteem) and setting-specific (Going shopping) applications of this knowledge and skill set. Users need to complete the first module before gaining access to the other modules, they can then complete additional modules in the order of their choice. The intervention is designed to be engaging and interactive. It includes video-based modelling of parenting skills with multicultural families. The built-in interactive exercises aim to improve knowledge acquisition and prompt parental problem solving, decision-making and behaviour activation. The program is personalised and employs a self-regulatory framework that enables parents to select goals informed by their own values, beliefs and traditions. To enhance usability and encourage sharing of information with partners, TPOL Brief also offers a number of downloadable resources.

Statistical Analyses

Given the current lack of data on predictors of Internet-based parenting programs, the relationships between a wide range of variables assessed as part of the RCT and the dependent variables were examined. The potential predictor variables were chosen on the basis of the wider literature on moderators of parenting interventions. They include: 1) demographic characteristics: parent age and gender, child age and gender, marital status, relationship to child, type of household (original family, sole parent family), number of children living in the household, parental education, employment status, ability to pay for essential expenses, money left over after paying for essentials, perception of family's financial position, cultural background and migration background, and languages spoken at home; 2) baseline levels of child behaviour problems, dysfunctional parenting and parental adjustment difficulties: ECBI (Intensity and Problem scales), PS Total score, DASS-21 Total score, PAI (Problem and Extent scales), PPC (Problem and Extent scales); 3) program related variables: Internet confidence, frequency of Internet use, previous access to parenting programs, completion of minimum dose or more, number of modules completed, per cent of program completed. Only variables with significant bivariate correlations with the dependent variables were then included in regression models to examine the ability of the variables to explain variation in the

outcome variable. Where both ECBI subscales correlated with the dependent variable, only one scale (the one that correlated higher with the criterion variable) was chosen for inclusion in the models to reduce the chance of multicollinearity. The same principle was applied for the PPC scales. Table 4.2 shows the bivariate correlation among predictor and criterion variables as well as means and standard deviations or per cent.

Table 4.2 *Bivariate Correlations among Predictor and Criterion Variables*

Predictor variables	*M* (SD) or %	Correlation with completion of minimum dose	Correlation with ECBI Intensity change score	Correlation with PS Total change score
Parent age	35.74 (5.55)	.174	.221*	.059
Child age	4.57 (1.88)	-.249*	.160	.085
Child gender (male)	52%	.071	-.205*	-.083
ECBI Intensity	148.28 (26.40)	.009	.450***	.254*
ECBI Problem	18.19 (6.72)	-.008	.399***	.291**
PS Total	3.33 (0.56)	.122	.151	.407***
PAI Problem	27.80 (7.73)	-.031	.276**	.196
PAI Extent	115.72 (27.96)	-.071	.171	.194
PPC Problem	6.48 (4.52)	-.263*	.330**	.294**
PPC Extent	38.84 (20.92)	-.334**	.272*	.322**

Note. *p < .05; **p < .01; ***p < .001

Completion of minimum dose.

Completing minimum dose was correlated with child age and baseline PPC scores (both subscales). Logistic regression was carried out to predict if a program user is likely to complete the recommended minimum dose, based on their child's age and the extent of disagreement over parenting with their partner. No other program related variables were included in these models.

Change in child behaviour.

Significant correlates of change in child behaviour at follow-up were parent age, child gender, and baseline scores on the ECBI (both subscales), PAI Problem scale and PPC (both subscales). None of the program related factors correlated significantly with change in child

behaviour, and were not included in the regression model. Hierarchical multiple regression was used to assess the ability of the potential predictors to explain variation in change scores on the ECBI Intensity scale. The order in which the variables were entered into the model is as follows: 1) baseline level of the criterion variable (ECBI); 2) parental adjustment (PAI and PPC); 3) demographic characteristics (parent age and child gender). Demographics were entered last because the main interest was in examining the impact of parent, child or family variables beyond what was contributed by other factors.

Change in dysfunctional parenting.

Change in dysfunctional parenting style was correlated with baseline ECBI scores (both subscales), PS scores, and PPC scores (both subscales). None of the program related factors correlated significantly with change in parenting. Standard multiple regression was used to predict changes in PS Total.

Results

Data analyses were based on 100 parents who were randomised to the Intervention group. The 9-month follow-up assessment was completed by 78% of the sample. Missing data due to attrition or missing values were dealt with by using Multiple Imputations (MI), carried out at the individual item level before calculating subscale scores (Schafer & Graham, 2002). The Markov Chain Monte Carlo method with 100 iterations was used to produce five multiply imputed data sets.

With regard to program completion, of the 98 parents who activated their account, 62% ($n = 61$) completed at least the recommended minimum dose of the introductory module plus one additional exemplar module. In addition, 53% completed 3 or more modules, 45% completed 4 or more modules, and 40% completed all 5 modules. Thirteen per cent completed the introductory module only, and 25% did not complete any modules, although the majority of users completed some activities within the introductory module.

Predictors of Completing Minimum Dose

The logistic regression model including child age and PPC Extent as predictors was a significant fit for the data $\chi^2 = 15.28$, df 2, $p<.001$, and correctly identified 72.8% of cases. Both child age ($B = -.33$, $SE = .14$, OR= 0.72, 95%CI = [0.55, 0.95], $p = .019$) and PPC Extent ($B = -.04$, $SE = .015$, OR= 0.96, 95%CI = [0.94, 0.99], $p = .011$) made a significant contribution to the prediction of minimum dose. As child age and the extent of disagreements over parenting issues increases, the chances of completing minimum dose decreases.

Predictors of Change in Child Behaviour

The first block of the hierarchical regression containing baseline ECBI Intensity scores explained a significant proportion of variance in ECBI Intensity change scores, suggesting that parents that initially report higher intensity of child behaviour problems see greater improvements

at follow-up (see Table 4.3 for beta weights, R^2 and F change statistics for each block of predictors). The addition of PAI Problem and PPC Problem scores at block 2 did not contribute significantly to the prediction, and ECBI Intensity continued to be a significant predictor. The contribution of adding parent age and child gender to the model in block 3 was inconclusive, as it ranged from significant to non-significant across the multiply imputed data sets, and ECBI Intensity continued to be a significant predictor. However, PPC Problem and parent age emerged as significant predictors at this step. Parents that were older or reported more disagreements over parenting pre-intervention reported more improvements in child behaviour at follow-up. The overall variance explained by the model is R^2= 30.9 – 32.5, $F(2,75) = 6.72 - 7.22$, $p < .001$.

Table 4.3 *Predictors of Change in Child Behaviour*

Predictor	Step 1			Step 2			Step 3		
	B	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*
ECBI Intensity	.44	.09	.47–.48***	.45	.13	.48–.51***	.51	.14	.54–.58***
PAI Problem				-.42	.46	-.11– -.15	-.60	.46	-.17– -.21
PPC Problem				1.29	.67	.20–.23	1.41	.65	.22–.25*
Parent age							1.11	.47	.21–.27*
Child gender							1.89	5.25	.03 – .06
	$R^2 = .22–.23$,			$\Delta R^2 = .04$,			$\Delta R^2 = .04–.07$,		
	$F(1,79) = 22.33–23.90$,			$F(2,77) = 1.82–2.26$,			$F(2,75) = 2.31–3.81$,		
	$p < .001$			$p = .112–.170$			$p = .027–.106$		

Note. *p < .05; **p < .01; ***p < .001, where ranges are given they indicate results across all five multiply imputed data sets.

Predictors of Change in Parenting

Standard multiple regression was used to test whether PS Total, ECBI Problem and PPC Extent would explain a significant proportion of variation in PS change scores. Together these variables explained 21 – 23% of the variation in follow-up change scores, $F(3,77) = 6.68 - 7.69$ (range across multiply imputed data sets), $p < .001$. However, only baseline PS scores were a significant predictor ($B = .24$, $SE = .10$, $β = .25 – .27$, $p = .020$). Parents that reported more use of dysfunctional parenting strategies pre-intervention reported more improvements in parenting style at follow-up. ECBI Problem ($B = .01$, $SE = .008$, $β = .17– .18$, $p = .116$) and PPC Extent ($B = .005$,

$SE = .003$, $\beta = .15 - .22$, $p = .104$) were not significant predictors of improvements in dysfunctional parenting.

Discussion

We aimed to identify significant predictors of program use (as defined by completion of minimum dose) and predictors of treatment outcome in regard to improvements in child behaviour and parenting style. The findings indicate that parents of younger children are more likely to complete the minimum recommended dose of the program. This is consistent with Dishion and Patterson's (1992) finding that parent training is effective for both younger and older children, but "drop out" from treatment is more likely among families with older children. For the current study, this may be due to the selection of topics and the order in which they were presented. Even though after completion of the introductory module parents were free to complete the modules in whichever order they preferred, the majority of users appeared to complete the intervention in a linear fashion. This means that the module that came next after the introductory module was the module on disobedience, a topic that may be of more concern to parents of younger children.

Interestingly, contrary to a study by Dittman et al. (2014), module completion was not significantly correlated with outcome. Again, this may be due to the nature of the intervention. As TPOL Brief is a light touch program for parents with a small number of discrete problems, parents are encouraged to complete the specific modules that relate to their behaviour concerns, rather than completing a sequential program with a number of modules. All modules are structured similarly to teach parents a sequence of applying the strategies presented in the first module to the different topics in the exemplar modules (e.g., identifying why the problem happens, monitoring behaviour, preventing the problem, dealing with misbehaviour). Parents are hypothesised to generalise this skillset across behaviours and settings after completing one or two exemplars; so completing additional modules may not have an additive effect, particularly if the topics are not of concern to the family.

Another finding of the study is that higher baseline ECBI scores predicted greater improvement at follow-up. Although the notion that a low intensity intervention like a self-directed online program could be suitable for families with intensive problems can seem counter-intuitive, these results are in line with several other studies, including a meta-analysis by Nowak and Heinrichs (2008). Their results showed that trials (including programs of varying intensity) focusing on children with elevated or clinical range behaviour problems at baseline showed higher effect sizes. There could be several reasons for this. Families with highly disruptive children may be more motivated to change and their children's behaviour may have more room to move. It could also be due to a general tendency of extreme scores to regress towards the mean. Or perhaps parenting interventions in general might be more beneficial for children with more severe deviant and

externalising misbehaviour or more distressed families. Similar results have been reported for other parenting programs (e.g., Chamberlain et al., 2008; Reid, Webster-Stratton, & Baydar, 2004). The same pattern was evident for PS scores, with parents showing higher pre-intervention use of dysfunctional parenting strategies reporting greater improvements in parenting. However, similar to findings reported in the literature, parents that reported the highest levels of dysfunctional parenting and child behaviour problems pre-intervention were still in the highest range at follow-up.

The study also revealed that parents who were older reported more improvements in child behaviour at follow-up. This is contrary to results reported by Beauchaine et al. (2005) who found more positive treatment outcomes for children of younger mothers. The author is unable to offer a conclusive explanation for this finding, but speculates that age could be confounded with other factors that were not assessed (e.g. parental self-efficacy) that could mediate the effect of parent age on outcome.

An interesting factor that emerged in this study was the influence of parental disagreement over child rearing. Even though parents with higher disagreement over parenting issues were less likely to complete minimum dose, they were more likely to report decreases in child behaviour problems at follow-up. One optimistic interpretation of these findings is that these parents perhaps achieved the change they were hoping for early on in the intervention and therefore did not complete further modules. Conversely, parents that have conflict and disagreement over parenting are perhaps less likely to complete a program together and be supportive of each other when practising new strategies. Nevertheless, they may also have more room for improvement and benefit from parenting programs in several areas. For example, research suggests that completing an online parenting program can be associated with improved child behaviour, less use of ineffective discipline, greater parental confidence, as well as less parental stress, anger and conflict over parenting (Sanders, Baker, et al., 2012). Different subsystems within the family are interdependent (Family Systems Theory, Cox & Paley, 1997) and the emotional and behavioural dynamics of one subsystem (e.g., parent-child relationship) may affect the functioning of other subsystems (e.g., inter-parental relationship). A positive aspect of this is that interventions in one area can have positive spill over effects in other areas. For example, Cummings et al. (2008) were able to show that a brief prevention program for improving marital conflict improved marital satisfaction as well as parenting and child adjustment, with improvements maintained at 2-year follow-up (Faircloth, Schermerhorn, Mitchell, Cummings, & Cummings, 2011). Similarly, Cowan, Cowan, and Barry (2011) showed that participation in a couples group before their child's transition to elementary school had long term benefits for both the couple and the child over a period of 10 years.

This interdependency presents an opportunity for the benefits of both parenting and couples interventions to be combined to potentially enhance outcomes for the inter-parental relationship as

well as parent-child relationship (Fincham, 1998; Hahlweg, Baucom, Grawe-Gerber, & Snyder, 2010). For example, this could occur by offering advice on dealing with marital conflict before completing a parenting program, to increase the likelihood of completing a sufficient dose of the intervention. Alternatively, strategies that address inter-parental communication and support can be added to a regular parenting program. One such example is Enhanced Triple P that includes a partner support module and a coping skills module as an adjunct to the Standard Triple P intervention (Sanders, Markie-Dadds, Tully, & Bor, 2000).

To summarise the findings of this study, demographic factors do not have a large or straight-forward influence on intervention effects. No specific child or parent factors apart from older parental age emerged as predictors of treatment outcome. While this study was unable to outline demographic characteristics that could describe a 'profile' of the type of family or parent most likely to benefit from TPOL Brief, findings confirm that the intervention could be beneficial for a range of families from different backgrounds. This includes families that may not traditionally have been triaged into brief, self-directed interventions, such as those from disadvantaged socio-demographic background, parents that experience conflict over parenting with their partners, and families that report high levels of dysfunctional parenting and child behaviour problems.

A few limitations need to be considered when interpreting these results. Firstly, the low number of fathers limits the generalisability of the findings to both genders, as fathers potentially complete online programs differently and treatment outcome could be predicted by different factors. In this study, the same pattern of results emerged when fathers were excluded from the analyses, so results of the full sample were reported. Also, there was not a sufficiently large spread across the number of completed modules. Perhaps with a larger sample a dosage effect would emerge. Finally, this study only investigated potential predictors. Future studies should carry out moderator and mediator analyses, perhaps using a larger sample size and pooling outcomes across a number of online trials, so a larger range of moderators and mediators could be examined. This may help identify relevant mechanisms of change and elucidate the *when, why, how, for whom*, and *under what conditions* online parenting interventions produce positive outcomes for families.

CHAPTER 5:
GENERAL DISCUSSION AND CONCLUSIONS

This final chapter aims to briefly summarise the main findings of the thesis. It reflects on the contribution of this series of research to the field of parenting interventions and considers implications of the findings. Finally, this chapter discusses some limitations of the current research, followed by possible directions for future research.

The Field of Web-Based Parenting Interventions and its Current Limitations

The literature pertaining to parenting programs clearly indicates that they play a crucial role in the prevention and treatment of child emotional and behaviour problems (e.g., Epstein et al., 2015; Perrin, Leslie, & Boat, 2016). Parenting interventions have been proven effective in a number of different formats (Dretzke et al., 2009). One format that has received more attention in the last decade is delivery via the Internet. Web-based programs have great potential to decrease barriers to attendance and present a cost-effective way to increase program accessibility and reach. Nonetheless, research into Internet use for parenting support is still in its infancy. To date, some web-based interventions have been evaluated for parents, but there is a paucity of interventions for parents of children with behaviour problems (Hall & Bierman, 2015). The few programs that have been evaluated have shown promise in reducing dysfunctional parenting and child behaviour problems (e.g., Enebrink et al., 2012; Rabbitt et al., 2016; Sanders, Baker, et al., 2012; Sourander et al., 2016). However, they are relatively intensive (8 or more modules) and a large proportion of families discontinue use before completing the entire intervention. These programs are also often augmented with supplementary delivery modes like telephone calls or email support from a therapist (Enebrink et al., 2012; Rabbitt et al., 2016; Sourander et al., 2016), the provision of a purpose built social network (Love et al., 2016) or home visits (Taylor et al., 2008). While these additional options may increase intervention efficacy for some parents, they limit the cost-effectiveness and around-the-clock availability of web-based programs. There are currently no brief, self-directed interventions available that aim to provide parents with the minimally sufficient amount of help needed, to maximise cost-efficiency of the intervention.

The primary aims of this research were to: 1) examine current parental Internet use and preferences for parenting support to establish the feasibility of brief, online interventions in reaching a broad range of families; 2) determine the efficacy of a brief online parenting intervention; and 3) examine to what extent use and outcomes of the online parenting intervention were influenced by a range of family and program-related factors. This thesis adds to the current understanding of how to best support parents in raising their children, and outlines the potential application of a brief, low-intensity parenting intervention delivered via the Internet.

Key Findings of this Research Series

1. Parents from a range of socio-economic backgrounds use online resources for parenting advice and perceive online parenting support options as useful.

Little is known about parents' use of the Internet for parenting information and their attitude towards online parenting programs, particularly in an Australian context. The first part of this thesis examined the potential of the Internet to increase access to parenting support and established the feasibility of online parenting programs. Results from a cross-sectional survey presented in Chapter 2 confirm that the majority of parents of 2−12-year-olds in this Australian sample already use parenting websites and social media for parenting information, and that they regard low intensity interventions and web-based delivery as useful. The highest perceived usefulness ratings were given to parent seminars and individually tailored programs, followed by television programs, self-directed web-based programs and social media. The Triple P – Positive Parenting Program already offers a number of brief parent seminars (Sanders et al., 2009) and individually tailored parenting interventions (Turner & Sanders, 2006) as part of its multilevel system. Interventions delivered via television (Metzler et al., 2012), Internet (Sanders, Baker, et al., 2012) and social media (Love et al., 2016) are a more recent addition and have shown promise in research trials. The addition of TPOL Brief extends Triple P's suite of interventions further and offers parents greater choice. Results from an RCT reported in Chapter 3 confirmed that the newly developed TPOL Brief is in line with consumer preferences, with parents giving positive program feedback and rating their satisfaction with the intervention highly.

Encouragingly, and contrary to previous literature (Rothbaum et al., 2008), online parenting support does not seem to follow a 'digital divide', with almost equal access to and use of online parenting information between people of low and high SES in this sample. Younger child age emerged as a predictor for parenting website and social media use. Other factors associated with greater use of social media were younger parental age, being female, not working and spending more hours online. This study provides preliminary evidence for the capacity of online parenting information and programs to reach a wide variety of parents, including those typically less likely to participate in parenting interventions. In this sample, at-risk parents were as likely or more likely to endorse web-based information sources as their counterparts.

2. A brief, self-administered online version of the Triple P – Positive Parenting Program (TPOL Brief) is efficacious in improving child and parent outcomes.

The inclusion of effective low intensity web-based parenting interventions in a population level approach to parenting support has great potential to increase the accessibility and reach of parenting programs, and thereby influence the prevalence of child behaviour problems. To the best of the author's knowledge, the RCT described in Chapter 3 is the first RCT of a brief, online

intervention targeting child behaviour problems and therefore constitutes an important contribution to the field. The study including 200 parents with 2–9-year-old children with early onset disruptive behaviour problems provides initial support for the hypothesis that a brief parenting program delivered via the Internet (TPOL Brief) can bring about significant improvements in parenting and child behaviour. As predicted, for primary parents, use of TPOL Brief was associated with significantly decreased dysfunctional parenting, and greater parental confidence in dealing with problem behaviour (immediately after intervention and at 9-month follow-up) and significantly fewer and less frequent parent-reported child behaviour problems (at follow-up), compared to IUAU. This behaviour change was not limited to topics specifically addressed by the program, but seemed to generalise across behaviours and settings over time. Some positive effects on parenting, child behaviour and conflict over parenting were also evident for secondary parents at follow-up assessment, even though the majority of secondary parents did not participate in the online intervention. There were no significant improvements in parental adjustment and observed negative parent and child behaviour or parents' adjustment for either primary or secondary parents as rates were low from the outset.

3. Intervention benefits are not limited to a particular type of family or user. More severely impaired families benefit most.

The third study of this thesis aimed to identify those most likely to benefit from TPOL Brief. Results support previous research indicating that families with higher baseline levels of problems benefit at least as much from parenting interventions as families with fewer problems (Sanders, Kirby, et al., 2014). The most important predictors of greater improvements in child behaviour and parenting following participation in TPOL Brief were higher pre-intervention levels of problems in those domains. Greater improvement in child behaviour was also predicted by older parental age and more intense conflict over parenting pre-intervention. No other parent or child demographics, socio-economic background, parental adjustment or program related factors predicted treatment outcomes, pointing to the suitability of TPOL Brief for a broad range of parents.

Further Conclusions and Implications of the Research

The role of previous experience and comfort with the Internet.

Both the consumer survey and the RCT recruited a sample of parents of which the majority (68% and 75%, respectively) had never participated in a structured program on parenting or child development. These rates are similar to statistics identified in the wider literature (Breitenstein et al., 2014). This means that this research attracted a large proportion of the kind of families that currently do not access evidence-based parenting support; the very people online parenting interventions are designed to serve. People without previous experience with parenting programs seemed equally motivated and showed similar completion rates of the online intervention as people

that had previously accessed a parenting program. Promisingly, participation in TPOL Brief also seems to be associated with a positive change in parents' attitudes towards parenting support in general, be it Triple P or other programs. Half of the intervention group families in the RCT indicated feeling more positive towards parenting programs after using TPOL Brief, and about three quarters of participants reported being likely to participate in online or face-to-face parenting support in the future.

Related to this, participants of the cross-sectional survey (Chapter 2) that currently used parenting websites or had previously done any kind of online course rated the usefulness of web-based programs higher than participants that were not familiar with such online resources. This indicates that previous experience with online parenting information and perhaps comfort with technology, in line with research by Doty et al (2012), may impact on parents' likelihood to use online parenting support. This has several implications:

1. Once families have successfully completed an online program, they may be more likely to seek help in the future when necessary, both online and in person. Therefore brief online interventions present an ideal entry level to parenting support to those who are interested in this delivery format, and may provide a gateway to other services. Having positive experiences with 'trying out' treatment in a non-threatening, anonymous way may lead to decreased stigma and misperceptions, which can be built upon with more intensive interventions if necessary. As a cautious note, this may also imply that users who do not benefit from a brief online intervention may be less likely to seek help in the future. Although in this sample only 3% of users had less favourable attitudes toward parenting support after participating in the RCT, it underlines the importance of understanding more about who benefits from these kinds of interventions. Online parenting support should not be seen as a 'blanket' approach or panacea that can simply be offered to all families with Internet access and then followed up with other interventions if necessary. The field knows too little about the potentially damaging effects of enrolling in unsuitable interventions. We need to understand more about moderators of positive treatment outcomes, so that parents can be triaged to an appropriate intervention option that is most likely to deliver the greatest benefits. Additionally, it is crucial that parents access evidence-based interventions to ensure positive experiences and outcomes.

2. The downside of the potential importance of previous experience with online parenting support and comfort with technology is that this may present a barrier to program adoption among parents who do not currently use the Internet. When implementing online interventions in populations where little Internet experience and comfort are more commonly encountered, for example in low and middle income countries, it may be important to provide access to resources and extra training to increase parents' ability and willingness to participate in online interventions,

and increase their chance of experiencing positive intervention effects.

The effect of child age.

Neither Chapter 2 nor Chapter 4 identified a digital divide or a socio-demographic profile of families that are less likely to use the Internet or benefit from an online intervention, pointing to the suitability of the Internet in general, and TPOL Brief specifically, for a wide range of parents and children from different background. However, one demographic factor did emerge as important: Both Chapter 2 and 4 confirmed that parents of younger children are more likely to engage with online resources. Younger child age emerged as a predictor for parenting website and social media use in the cross-sectional survey, as well as a predictor for completing at least the minimum recommended dose in the RCT. Intuitively, one might assume a relationship between child age and parent age and perhaps hypothesise that parents of younger children are younger themselves, and that the younger generation in general is more experienced using the Internet. However, parental age was not associated with the use of web-based resources. Perhaps the association with younger child age is an artefact of the content of parenting websites and also TPOL Brief, which often contain a wider range of issues related to younger children. Extending the range of topics covered in programs such as TPOL Brief to cater more for older children may make the program more attractive and pertinent for parents of older children.

Alternatively, parents of younger children may be more used to seeking information and support in general and not just online, because of the many developmental milestones that children reach in their early years and the required constant adaptation of parenting skills and strategies. This opens up the opportunity to expose parents to evidence-based parenting support early on in their 'parenting career'. For example, if parents' experience with information and support during pregnancy, the transition to parenthood and throughout their child's toddlerhood are positive, they may be more likely to seek support (online or offline) for parenting challenges they may face with their pre-schooler, when transitioning to school and through to adolescence. If the field were able to promote a greater use of evidence-based information and prevention programs before the first emotional and behavioural challenges arise, it may be possible to foster more positive developmental trajectories and decrease the need for intervention later on in a child's life.

The importance of intervention dosage.

Program adherence and dosage are typically low for web-based interventions, particularly for those freely available to the public (Eysenbach, 2005). In this RCT, 62% of users completed the prescribed minimum dose of 2 modules, with 25% not even completing the introductory module. The average program exposure was 3.8 hours. Nevertheless, intervention group outcomes were still positive. This means that we are potentially underestimating the promise of online interventions. If web-based interventions consistently achieve at least small to moderate effects even with users

generally not completing the whole intervention, it is exciting to imagine the even greater impact of such programs if more users could be engaged to complete all recommended program modules.

Dosage has been shown to be a predictor of outcome for parenting interventions (e.g., Dittman et al., 2014). Therefore this program of research examined if dosage influenced outcomes of TPOL Brief. Chapter 4 did not confirm dosage to be a significant predictor of improvements in parenting or child outcomes. The lack of an obvious dosage-response relationship is not uncommon for online interventions, and research in other areas has reported similar results (Donkin et al., 2011). Conversely, the RCT in Chapter 3 still showed more improved outcomes in some areas (dysfunctional parenting, child behaviour concerns and parent confidence) for parents that completed at least the minimum recommended dose of the intervention (the introductory module plus one exemplar module). This inconsistency between studies may have eventuated because of the use of slightly different measures (e.g., PS Total scale instead of the three subscales) or an insufficient variability across the number of modules completed for robust statistical analysis. Even though findings from this research only partly support the impact of dosage on program outcomes, it may still prove beneficial to increase program adherence for TPOL Brief. Hence some possible ways to do so will be discussed.

One factor that was associated with increased dosage in both Chapter 3 and 4 of this thesis was lower levels of conflict over parenting. Research indicates that programs aimed at enhancing the parents' relationship may present an effective way to prevent or treat child behaviour problems. For example, a study by Zemp, Milek, Cummings, Cina, and Bodenmann (2015) demonstrated that a couple-focused intervention (Couples Coping Enhancement Training) independently and differently reduced child behaviour problems compared to a parenting training (Triple P). The couple-focused program enhanced mothers' views of their partner relationship quality, which, in turn, significantly reduced child behaviour problems. In mothers of the Triple P group the treatment effects on child behavioural problems were mediated by improved parenting. So both interventions effectively improved child behaviour, but through different mechanisms. As discussed in Chapter 4, the inclusion of couple intervention components before or alongside a parenting intervention may be a useful strategy to increase dosage and also improve parenting, child and relationship outcomes for families with partner conflict.

Research in dissemination suggests that the opportunity to trial an innovation is positively related to its ultimate adoption (Rogers, 2003). Therefore, another possibility to increase enrolment and adherence might be to offer sample videos or previews of the next module to entice parents to start the program and then continue to complete more models as they have a better understanding of what they are signing up for.

Another way to increase adherence and encourage continued program use could be to

include short messages, automated reminders or other alert features (Whitton et al., 2015). These 'push' technologies like email or text reminders, Facebook posts, and tweets can deliver content and serve as repeated reminders to encourage users to engage with the intervention. A review and meta-analysis of 85 web-based health interventions showed that intervention effectiveness was enhanced by the use of additional methods of communicating with participants, especially the use of text messages (SMS) (Webb, Joseph, Yardley, & Michie, 2010). The use of mobile phone text messaging has also been found useful in other fields, for example as a tool to support diabetes management (Hanauer, Wentzell, Laffel, & Laffel, 2009), to increase attendance at medical appointments (Boksmati, Butler-Henderson, Anderson, & Sahama, 2016) or to enhance clinical practice of face-to-face mental health care (Jones et al., 2015).

Lastly, another way to potentially increase program adherence and ensure that parents receive a sufficient dose of the intervention could be to include therapist support. However, the potential benefits of including additional support need to be weighed up against the increased cost and potentially decreased access.

On a final note, it may be useful to consider that attrition could represent a natural form of program to participant match, with those parents not completing being not suited to such an intervention, and parents completing being well suited.

Implications for dissemination and implementation.

The timely dissemination and implementation of effective interventions into services needs to be a goal of the field if we are to impact the treatment gap and make evidence-based interventions widely available (e.g., McHugh & Barlow, 2010; Weisz, Ng, & Bearman, 2013). One of the biggest challenges in addressing child mental health problems is the shortage of skilled staff. Face-to-face delivery of interventions is unlikely to ever meet the demand. Dissemination models for low intensity online interventions may be able to utilise non-specialised support persons in treatment delivery (thus reducing costs further), or in the case of self-directed programs even include no support at all. For example, access to brief online parenting programs could be offered through the family's doctor, school, or childcare provider, to reach many families concurrently, without waiting lists. This approach also takes advantage of the fact that parents identify these avenues as the most popular professional sources of parenting support already (as identified in Study 1). Currently these professions receive little training in offering parenting advice to parents or appropriate referrals, and their ability to provide parent consultations directly is often limited due to time constraints.

Online interventions, in particular self-directed programs, are also suitable for direct-to-consumer marketing as a complementary approach to existing dissemination efforts. To date, the majority of parenting programs are delivered by clinicians (Epstein et al., 2015; Piquero et al.,

2016). Consequently, dissemination and implementation efforts have been targeted at clinical providers. However, clinicians and clinical service providers may act as gatekeepers to parenting programs and information (Morawska et al., 2012). Therefore they can directly influence (and potentially hinder) the uptake of services more universally. For example, a practitioner may not be aware of, or trained in the use of evidence-based programs, or may have misconceptions and beliefs that certain interventions may not be suitable or effective for their clients. They may therefore discourage a family from completing a particular program, or not inform the family about available options. This can present an obstacle to parents seeking assistance for their children. In addition to the potential role of practitioners in influencing the types of interventions that families access, it can also be challenging for parents to find any practitioners in their local area. Direct-to-consumer-marketing forgoes these obstacles by offering interventions directly to the end user – the parents.

This does not mean that there is no role for specialised clinicians in online delivery of parenting interventions. Clinicians can use web-based interventions as an adjunct to their already existing service model to assist more families at once, and reach families that they would be unlikely to attract with traditional services. Brief online interventions can also serve as a light touch intervention while parents are on the waitlist for more intensive services, or as additional support in the maintenance phase after treatment. Many online programs may also require or at least benefit from additional practitioner support (Ingersoll et al., 2016). So if parents are open to personal contact, hybrid models that combine web-based delivery with professionally delivered interventions are a feasible option for practitioners. Additional benefits of incorporating online interventions into clinical practice could be the possibility of easily sharing information with other members of the family involved in treatment. For example, if only one parent is attending face-to-face sessions, the parent that is not able or willing to be present at sessions could acquire the same content by completing an online intervention.

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Limitations of the Research

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While some restrictions of each empirical study have been discussed in their prospective chapters already, this section aims to discuss some key limitations worth considering.

Generalisability of Findings

This program of research employed convenience samples of parents who self-selected for participation in the research studies. This sampling strategy may have attracted particularly frequent and comfortable Internet users. Additionally, while the studies included parents from a range of backgrounds, the majority of participating parents were Caucasian Australians with relatively high education and income. A sample inclusive of more high-risk parents and parents with limited Internet use would be useful in determining the generalisability of the findings. Additionally, the inclusion of more fathers would allow a separation of results by gender. The lack of father

involvement in parenting intervention research is a common problem (Cassano, Adrian, Veits, & Zeman, 2006). However, it is important to investigate effects separately for gender, as fathers may have different preferences for parenting support and derive different benefits from interventions (Lundahl, Tollefson, Risser, & Lovejoy, 2008). For example, research indicates that fathers may be more interested in web-based parenting support than in other sources of support (Thorslund et al., 2014) and that fathers tend to participate in online parenting courses alongside the mother to a greater extent compared to face-to-face programs (Enebrink et al., 2012). Research efforts are underway to gain more insight into intervention effects specifically for fathers (e.g., Frank, Keown, Dittman, & Sanders, 2014). The most recent meta-analysis of Triple P research (Sanders, Kirby, et al., 2014) included 27 studies that reported separate father data. The authors found significant small to medium effects on child outcomes ($d = 0.38$), parenting practices ($d = 0.35$), parenting satisfaction and efficacy ($d = 0.23$) and parental relationship ($d = 0.14$). However, no studies have investigated effects of online parenting interventions on fathers.

Methodological Considerations

One limitation of this thesis is the predominant use of self-report measures. For example, the cross-sectional survey relied on parental report of Internet use frequency, use of resources and ratings of perceived usefulness of hypothetical delivery formats of parenting interventions, rather than actual usage data. The RCT included observational measures of parent and child interactions in addition to self-report, however observational data did not confirm the significant intervention effect found for parent-report data. There are a number of possible reasons for these findings. Firstly, there could be a suppression effect for negative behaviour in observation tasks. Play tasks carried out in a clinic setting as opposed to at home tend to prompt more parental instructions and praise and fewer child conduct problems (Webster-Stratton, 1985). Secondly, given the small subsample of participants, it is possible there was insufficient power to detect effects. Lastly, the observational setting may not have captured improvements in parent and child negative behaviour because the tasks in the structured activities did not replicate the specific topic areas parents reported as challenging (e.g., going shopping). Matching the observational tasks to the individual problem situations and goals of each family may be useful in eliciting higher rates of difficult behaviour and measuring improvements over time, however this was not practicable for this program of research.

The Role of Parental Preferences

Taking into account parent preferences was a central goal throughout this program of research. The consumer survey assessed preferences for access to parenting information and modes of parenting programs. Parental preferences informed the intervention and consumer feedback was examined after intervention completion to further inform intervention development and future

research. While it is reasonable to expect that parental preferences may predict or moderate intervention use and outcome, this was not assessed as part of the research. Future studies should investigate the impact of parental preferences on the extent to which parents engage with, or derive benefit from, online interventions.

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Future Research Directions

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Although this research was able to provide preliminary evidence for the suitability and efficacy of brief online parenting support for parents of children with behaviour problems, many questions are left unanswered that provide opportunity for future research, particularly involving Triple P interventions, but also parenting programs in general. The following sections provide suggestions for such future research.

Research Involving the Triple P – Positive Parenting Program

Research is now needed to test the effectiveness of TPOL Brief under everyday conditions in a larger trial with a broader range of families, ideally including more at-risk, less advantaged families. Research also needs to expand on parent, child and family attributes that mediate or moderate intervention effects, to reveal who benefits most from this brief intervention format, and who requires more intensive interventions (Shoham & Insel, 2011). While the results of this thesis are unable to provide guidelines to triage families to treatment, they provide initial support for the suitability of TPOL Brief for a broad range of families.

In order to better understand participant engagement and behaviour change processes, careful analyses of patterns of use and mechanisms of change need to be carried out. This would inform decisions about which intervention components are essential (Kazdin & Blase, 2011), as very little is known about effective components, therapeutic processes or 'key ingredients' in online interventions in general.

The efficacy of TPOL (Sanders, Baker, et al., 2012) and TPOL Brief speaks to the further development of different levels of intensity of online interventions, to provide a 'parallel system' of online support to the Triple P multilevel system of face-to-face interventions. Essentially, every one of the five differing intensity levels of programs could include a web-based delivery option if proven efficacious. This includes more intensive interventions, such as Standard Triple P with added practitioner telephone support which has recently been trialled (Day & Sanders, 2016), or programs that include other additional support features like a purpose built social network to complement the online intervention (Love et al., 2016). The impact of enhanced programs for partner support or parent personal coping skills has not been tested. On the lower intensity spectrum, perhaps even briefer programs such as mobile phone applications could have their place in a tiered system of support (Donker et al., 2013). There is also benefit in evaluating online support for other parent groups, for example parents of teenagers or parents of children with disabilities, to

expand the existing suite of Triple P interventions and mirror the current face-to-face options. As the range of online parenting interventions expands, comparisons between differing levels of intensity, to other online programs and to face-to-face interventions will become useful to identify the delivery formats that best balance cost-effectiveness and benefit.

Research in the Larger Parenting Field

This program of research provides preliminary evidence that brief, low intensity parenting programs delivered online may take an important place in a public health approach and present a valuable and potentially cost-effective addition alongside traditional intensive individual or group-based parenting programs. Programs need to be developed and evaluated, and rigorously tested against other online or face-to-face interventions. Additionally, gaining detailed knowledge about who benefits from what type of online intervention under what conditions will help improve the match between interventions and consumers.

The field also knows little about the suitability of online interventions for low resource settings. For example, research should examine if online interventions can be employed in low and middle income countries, provided the required resources can be made available. An interesting development in this regard is the rapidly increasing mobile phone use in low and middle income countries. The growth rate of mobile phones and smartphones has outpaced the growth rate of personal computers in many developing countries and a majority of the web traffic is now through mobile devices (Nair & Bhaskaran, 2014). The increasing use of mobile phone technology may transform the future delivery of health care in these countries entirely (Arie, 2015) and present an opportunity for technology assisted parenting interventions to be delivered to parents who do not have access to any other services.

For parents in Australia and many other developed countries, accessing primary health care for their children is normative, and the majority of parents make use of developmental check-ups for their children from birth, immunisations against childhood diseases, and preventive dental visits. However, accessing mental health and parenting related support is still not normative and parents often perceive stigma attached to asking for assistance with parenting (Koerting et al., 2013). The Internet could be used for social marketing campaigns aiming to destigmatise and normalise help-seeking for parenting, and increase awareness of evidence-based interventions. Research indicates that parents are becoming informed consumers and want evidence-based treatment options (e.g., Sanders, Haslam, Calam, Southwell, & Stallman, 2011; Sumargi et al., 2015). Educating parents about evidence-based interventions may create pull-demand that will encourage practitioners to provide evidence-based programs in a variety of formats. Future research should investigate the impact of online social marketing on parenting and access to parenting support.

Final Comment

The damaging short- and long-term consequences of serious child behaviour problems are well established. Brief parenting programs delivered online have the power to reduce early onset conduct problems and promote positive family relationships, leaving children less vulnerable to developing long-term problems like antisocial behaviour and aggression, academic failure, substance use, risky sexual behaviour and mental health problems. They can potentially save billions of dollars in future mental health care and costs to society, as well as avert untold personal hardship (Bonin, Stevens, Beecham, Byford, & Parsonage, 2011; Raaijmakers, Posthumus, van Hout, van Engeland, & Matthys, 2011). Brief online parenting interventions can help combat some of the current limitations of parenting programs. They greatly increase the accessibility of programs and enhance the capacity of practitioners to offer support to all parents in need. They can also potentially increase recruitment rates as low intensity and web-based programs seem to be a preferred delivery format by many parents that counterbalances some of the most common barriers to treatment enrolment and completion (especially logistical barriers and feared stigma).

This program of research adds to the knowledge about how the Internet may be used to more effectively reach, engage, and assist a broad range of families with evidence-based parenting support. It is hoped that this thesis provides some impetus to encourage further research in this important field that is still very much in its infancy. It is interesting to speculate about the future of online parenting support. In an age of fast moving technology, new devices and software will inspire new forms of online parenting support in the near future. A challenge for the field will be to keep up with the constantly changing environment and find long lasting solutions for a variety of families. In the author's opinion, this will include a combination of face-to-face support, self-directed web- and technology-based delivery and a blended model where web-based interventions are augmented with different forms of additional peer or therapist support.

Researching effective prevention and treatment programs for common societal problems that have their origin in childhood (e.g., conduct problems, drug abuse, crime, teenage pregnancy) is one important step. However, to translate this research knowledge into population-wide benefits requires a perspective beyond attention to single problems. It is the author's hope that rather than trying to address each problem separately and implementing isolated interventions for clinically diagnosed problems, researchers and policy makers increasingly pay attention to the common environmental factors that contribute to all these problems, and assess how interventions and policies can alleviate them. A key to preventing many mental, emotional and behavioural disorders according to Anthony Biglan (2015), a leading figure in the development of prevention science, is finding ways to make everyone's environment less coercive and more caring. Biglan calls these 'nurturing environments'. Nurturing environments during early childhood minimise problem

behaviours and promote prosocial and self-regulatory skills. According to Biglan (2015, p. 6),
'…*the two most important environments for building a highly prosocial society are families and schools. Virtually every problem we seek to prevent emerges because of families and schools that fail to nurture prosocial development.*' It is hoped that the program at the centre of this thesis, Triple P Online Brief, can help parents to reduce coercion, improve relationships with their children and foster their children's prosocial development. If we are able to implement these kinds of brief but impactful programs widely, we can contribute to creating more nurturing environments and truly impact the population prevalence of behaviour problems in children.

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