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Evaluation of a Sexual Health Training for Child Welfare Workers

Abstract

Background: Elevated rates of early pregnancy and parenting among youth in foster care (YFC) are well documented. Training child welfare workers to provide sexual health information and resources is stated throughout the extant literature as a pressing need in efforts to prevent unintended pregnancy among YFC. However, few child welfare agencies offer such training to their workers, and little is known about the extent to which conversations about sexual and reproductive health already occur between child welfare workers and youth. Thus, this study aimed to: a) assess baseline attitudes, knowledge, and communication among child welfare workers regarding sexual health of YFC, b) examine how these constructs are interrelated, and c) evaluate the preliminary effectiveness of a sexual health training for child welfare workers by comparing those who received a sexual health training (n = 69) to those in other (non-sexual health) trainings (n = 132) on knowledge of services, attitudes towards communicating with youth, and past month communication about sexual health topics with YFC.

Methods: All participants were registered learners of a training through the Colorado Child Welfare Training System between August 2018 and February 2019. Baseline and 3-month follow-up survey data were collected from intervention participants who registered for the sexual health training and comparison participants who registered for non-sexual health trainings. Surveys included three to eight items measuring child welfare workers' behavioral beliefs, subjective norms, self-efficacy, knowledge, intentions to communicate in the current month, and past month communication with youth on their caseload regarding sexual health. Items comprising each construct had strong internal consistency and were combined to create mean scores. Descriptive and bivariate statistics were used to assess baseline constructs, path analysis was used to test relationships between the constructs, and regressions were used to examine the impact of the intervention on each outcome.

Results: At baseline, on average, caseworkers reported that they had discussed sexual health with 24% of their adolescent caseload in the past month. The path analysis revealed that subjective norms and self-efficacy had significant direct effects on intentions, and intentions were the sole statistically significant predictor of communication regarding sexual health. Self-efficacy also had an indirect effect on communication that was mediated by intentions. In analyses examining intervention effects, participants in the sexual health training showed more positive behavioral beliefs, self-efficacy, and knowledge compared to date- and region-matched comparison participants at the 3-month follow-up; there was no difference between the groups on intentions or communication.

Conclusions: Results demonstrate that self-efficacy and subjective norms are key constructs leading to caseworkers' intentions and communication regarding sexual health topics with YFC. Further, it is promising that the sexual health training increased behavioral beliefs, self-efficacy, and knowledge 3 months after the intervention. In order to influence the primary outcome of workers' communication with YFC regarding sexual health, additional intervention components may be needed such as administrative supports, policy changes, or booster trainings.

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Evaluation of a Sexual Health Training for Child Welfare Workers

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In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

by

Katie Massey Combs

June 2019

Advisor: Heather Taussig, PhD

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ABSTRACT

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TABLE OF CONTENTS

List of Tables.....	vii
List of Figures.....	viii
Chapter One: Introduction.....	1
Problem Statement.....	1
Specific Aims.....	3
Dissertation Organization.....	5
Positionality Statement	6
Chapter Two: Literature Review.....	8
Rates of Teenage Pregnancy and Childbirth.....	8
Outcomes of Teenage Parenting	11
Traditional Prevention Efforts for Teenage Pregnancy.....	13
Traditional Pregnancy Prevention Efforts Often Exclude Youth in Foster Care...19	
The Child Welfare System Is Uniquely Positioned to Intervene.....	22
Guiding framework.....	28
Study Context and Aims.....	37
Chapter Three: Methodology.....	40
Procedures.....	40
Response Rates and Sample size.....	45
Measures.....	48
Sexual Health Training.....	56
Analyses.....	61
Chapter Four: Results.....	66
Research Aim 1: Baseline Characteristics.....	66
Research Aim 2: Interrelationships Between Theory-based Constructs.....	70
Research Aim 3: Intervention Effects.....	75
Chapter Five: Discussion.....	79
Baseline Knowledge, Attitudes, and Communication.....	79
Interrelationships of Theory-based Constructs: Which Matter Most?.....	85
Intervention Impacts.....	90
Limitations.....	94
Policy and Practice Implications.....	97
Bibliography.....	103

LIST OF TABLES

Table 1: Components of Effective Sexual Health Curricula.....	14
Table 2: Date – and Region-Matched and Unmatched Comparison Group Trainings.....	41
Table 3: Recruitment and Pre-training Survey Response Rates by Region.....	46
Table 4: Sexual Health Training: Goals, Core Content, and Facilitation Techniques.....	58
Table 5: Baseline Descriptive Statistics of Demographics and Theory-based Constructs (N = 201).....	67
Table 6: Correlation Matrix of Baseline Theory-based Constructs.....	71
Table 7: Path Coefficients for All Relationships Tested in Figure 5 (N = 129).....	73
Table 8: Baseline Descriptives for Intervention and Date- and Region-Matched Comparison Groups (N = 156).....	76
Table 9: Regressions on 3-Month Post Mean Theory-based Construct Scores.....	78

LIST OF FIGURES

Figure 1: Theory of Planned Behavior (Ajzen, 1991).....	31
Figure 2: Gateway Provider Model (Stiffman et al., 2004).....	34
Figure 3: Theoretical model of factors leading to caseworkers' communication of information and services related to sexual and reproductive Health: Applying the TPB and Gateway Provider Models	37
Figure 4: Flowchart diagram of recruitment and response rates.....	47
Figure 5: Path analysis model diagram of relationships tested.....	65
Figure 6: Path analysis diagram with standardized coefficients for significant associations at the $p < .05$ level shown in solid lines and trends at the $p < .10$ level shown in dotted lines.....	72

Chapter One: Introduction

Problem Statement

Teenage pregnancy and childbirth rates have been steadily declining in the U.S. since the 1990s (Hamilton, Martin, Osterman, Curtin, & Mathews, 2015); however, this is not the case for youth in foster care (YFC) (Svoboda, Shaw, Barth, & Bright, 2012; Winter, Brandon-Friedman, & Ely, 2016). Two seminal, longitudinal studies found that approximately half of females emancipating from foster care reported a pregnancy by age 19 (Courtney et al., 2016a; Dworsky & Courtney, 2010). This was more than two times greater than pregnancy rates in a national sample of youth of similar age and racial composition (Dworsky & Courtney, 2010). A recent study examined pregnancy rates of young adults with a history of foster care in Colorado and found similar rates, with 43% of females and 28% of males reporting a pregnancy from sexual relationships during their teenage years (Combs, Begun, Rhinehart, & Taussig, 2018). Over a quarter of these youth went on to become parents. Studies suggest that the majority of pregnancies to YFC are unintended (Combs et al., 2018; Courtney et al., 2016a). Moreover, evidence indicates that elevated rates of unwanted or unintended pregnancy are largely driven by lack of knowledge and access to sexual and reproductive health education and services (Basch, 2011; Domenico & Jones, 2007). Ensuring that YFC have adequate knowledge, education, and access to services to prevent pregnancies is an essential reproductive right and social justice issue with critical implications for child well-being and social work.

Interventions to decrease unintended and teenage pregnancy have largely focused on direct education and service provision to youth, and these interventions are typically delivered through parents, schools, or communities (Hoffman, 2006; Jaccard, Dodge, & Dittus, 2002; Jones, Biddlecom, Hebert, & Mellor, 2011). Intervening through these systems is problematic for YFC though, as they frequently experience disruptions in relationships with their families, schools, and communities (Constantine, Jerman, & Constatine, 2009; Love, McIntosh, Rosst, & Tertzakian, 2005; Hudson, 2012; Boustani, Frazier, Hartley, Meinzer, & Hedemann, 2015). As the primary broker of services, the child welfare system, and specifically caseworkers, are distinctively positioned to fill education and service gaps related to sexual and reproductive health for youth involved in the child welfare system (Winter et al., 2016; Garwood, Gerassi, Jonson-Reid, Plax, & Drake, 2015; National Campaign to Prevent Teen and Unplanned Pregnancy, 2016). Additionally, studies show that YFC want actors in child welfare, such as caseworkers and foster parents, to be more proactive in communicating with them regarding sexual and reproductive health (Constantine et al., 2009; Love et al., 2005). Despite this, little is known about the frequency or extent to which child welfare workers talk with youth about sexual and reproductive health, or what factors lead to workers communicating with youth. The limited evidence suggests that sexual and reproductive health topics infrequently arise between youth and caseworkers (Constantine et al., 2009; Dworsky & Dasgupta, 2014; Pilgrim, 2012). Caseworkers often feel unprepared to engage in these topics (Constantine et al., 2009; Love et al., 2005; Dworsky & Dasgupta, 2014), lack resources to do so (Courtney et al., 2016b), and want more training (Dworsky &

Dasgupta, 2014). One of the only evaluations of a sexual health training for caseworkers suggested that discomfort and lack of knowledge impedes child welfare workers from communicating about sexual and reproductive health (Dworsky & Dasgupta, 2014). It concluded that there is a pressing need for training child welfare workers on sexual health for YFC, and called for further research with more rigorous designs (i.e., research with comparison groups) (Dworsky & Dasgupta, 2014). Further, little is known about the knowledge, attitudes and behaviors of caseworkers related to addressing YFC's sexual health needs.

The current study fills a critical gap by assessing child welfare workers' knowledge, attitudes, and behaviors, and how these constructs are interrelated. Understanding how these constructs are associated lends insight into what factors promote or hinder sexual health communication between workers and youth, which has critical implications for intervention development and practice. Last, this study compares changes in knowledge attitudes and behaviors between caseworkers who received a sexual health training to those who did not. This study contributes new knowledge regarding a low-cost, feasible strategy for child welfare systems to prevent unwanted sexual health outcomes among YFC.

Specific Aims

Ensuring that YFC have adequate knowledge, education, and access to services to prevent pregnancy is an essential reproductive right and social justice issue that has critical implications for child well-being, youth educational and economic achievement, and prevention of child maltreatment in the next generation. The child welfare system can

serve as a gateway to reducing barriers and increasing access to sexual/reproductive health education and services for YFC; however, it has been largely un-utilized and untested. Specifically this study aims to:

- 1) Assess child welfare workers' (a) baseline knowledge about sexual/reproductive health policies and resources for YFC, (b) baseline attitudes towards communicating with YFC about sexual/reproductive health information and services, (c) baseline proportion of caseload that caseworkers communicate about topics of sexual and reproductive health with youth on their caseloads, and (d) demographic differences in baseline knowledge, attitudes and communication.

Hypotheses: For Aim 1, it is hypothesized that baseline attitudes about communicating with YFC about sexual health will be positive, but little communication would actually be occurring. Given the paucity of data on demographic differences in child welfare workers' knowledge, attitudes, and beliefs part d of Aim 1 is exploratory and therefore no hypothesis is provided.

- 2) Explore the direct and indirect relationships between child welfare workers' baseline knowledge of resources, attitudes towards communicating with YFC, and communication with youth on their caseloads about sexual/reproductive health information and services.

Hypotheses: It is hypothesized that baseline knowledge, attitudes and behaviors will all be positively associated, and that knowledge and attitudes would have a direct effect on behaviors. Given that these relationships have

never been tested in the context of child welfare workers communicating with YFC about sexual health, hypotheses around which constructs are most important or which have indirect effects on communication are exploratory and therefore no hypothesis is provided.

- 3) Examine the preliminary efficacy of a training designed to increase child welfare workers' knowledge, positive attitudes and behaviors related to communicating with youth on their caseloads about sexual/reproductive health information and services.

Hypothesis: It is hypothesized that the training will positively influence child welfare workers' knowledge, attitudes, and their communication with youth measured 3 months after the intervention.

Organization of Dissertation

This introductory chapter provided an overview of the problem and the study's purpose and aims. There are four subsequent chapters of the dissertation. Chapter Two provides a comprehensive review of the literature regarding early pregnancy in general populations as well as in YFC, pregnancy prevention programming, and the role of child welfare systems in sexual and reproductive health of YFC. The second chapter reviews theoretical frameworks that undergird the intervention approach and measurement model of this study using the Theory of Planned Behavior (Ajzen, 1991), and the Gateway Provider Model (Stiffman, Pescosolido, & Cabassa, 2004). Chapter Three describes the study's methodology, including the intervention approach, sampling, recruitment, measures, and analytic plan. Chapter Four presents results from the study. Finally, in

Chapter Five, implications of the study's findings, recommendations for future research and practice, and study limitations are discussed.

Positionality Statement

As a white, cis-gendered, highly educated doctoral candidate conducting research that centers around an extremely vulnerable population, the impacts of my own positionality on review of the existing literature, selection of theory, intervention, study design, data collection, and analyses were considered throughout the research process. Though I have worked with vulnerable youth, I have never experienced foster care or any form of abuse or neglect, and thus I seek to carry cultural humility and transparency around the assertions of risks and needs for YFC.

My pragmatic and positivist orientation led me to various decisions related to this study. For example, the decision to use a quasi-experimental design, a quantitative survey that is easy for participants complete, and theoretical frameworks that have been empirically tested almost entirely through quantitative research. I am also the developer, implementer and evaluator of this training intervention. While acting in these multiple roles presents limitations to the study design, as a pragmatist, acting in these roles was the surest way to implement this study, and ensure that the training would be revised for improvements.

In addition to evidence from the literature, it was my own clinical experience as a caseworker, as well as my time as an abortion and reproductive health counselor, that influenced my belief in the need for this research. My work experience developed my own belief that YFC desperately lack sexual and reproductive health education and

services, and that social workers and child welfare workers rarely engage on these topics and need training.

Beyond my clinical experience, my background and life experience leads me to believe that training child welfare professionals on this often heated and controversial topic can make a difference in the lived experiences of YFC. My background and upbringing often reflects some of the strongest opponents to sexual and reproductive health, yet some of the strongest supporters of YFC. I am from Alabama, raised Southern Baptist, and worked in an anti-abortion drop-in center. I understand and am intimately connected to a community that often resists initiative to empower youth around sexual health, yet it is a community that is known to be stakeholders in child welfare (e.g., faith based agencies, caseworkers, and foster parents). Due to this intersection of life experiences, I believe that left and right, conservative and liberal, all seek to better the lives of YFC. I deeply believe that all sides can be brought to the table and ameliorate the sexual health disparities for YFC, and see myself as someone who must be a part of building this understanding, communication, and bridge. I believe that my background and life experience not only allows me, but requires me to bring a wide range of stakeholders to the table on the topic of youth sexual health.

Chapter Two: Literature Review

Rates of Teenage Pregnancy and Childbirth

Teenage pregnancy and birth rates in the United States have declined for all races and ethnicities since their peak in the 1990s (Hamilton et al., 2015). Yet, they remain higher than in any other developed country, and notable disparities exist across demographic groups (Hamilton et al., 2015). In 2011, the national teenage pregnancy rate was 52.4 pregnancies per 1,000 females aged 15 – 19. Thus, roughly 5% of females in this age group became pregnant (Kost & Maddow-Zimmet, 2016). Teenage pregnancy rates varied dramatically by race, as the rate for Black (92.6 per 1,000) and Hispanic/Latino (73.5 per 1,000) female teenagers was more than two times the rate for White females (35.3 per 1,000). In 2011, approximately 60% of teenage pregnancies resulted in a live birth, 30% ended in abortion, and 10% in miscarriage or stillbirth (Kost & Maddow-Zimmet, 2016).

Youth in foster care (YFC) are a specific and unique group in the United States who experiences an earlier than average age of first sexual initiation and higher rates of sexually transmitted infections and pregnancy as compared to youth who are not in foster care (Winter et al., 2016). Rates of pregnancy and childbearing among YFC have only recently become clear through several large, representative regional studies. Two seminal studies, one in California (CalYouth) and one in three Midwestern (Midwest Study) states, followed youth emancipating from foster care into young adulthood (Courtney,

Dworsky, Ruth, Keller, Havlicek, & Bost, 2005; Courtney et al., 2016a). In both of these samples, approximately one-third of female respondents reported a pregnancy before 18 years of age. By age 19, this increased to almost half of all females, which was more than two times greater than pregnancy rates in a national sample of youth of similar age and racial composition (50.6%) (Dworsky & Courtney, 2010; Courtney et al., 2016a). As a group, youth who had a child reported that approximately two-thirds of their last pregnancies were unplanned (Courtney et al., 2005). A more recent, but smaller study, in four counties in Colorado found a similar rate of pregnancy among youth with experience in foster care, with 43% of females reporting a pregnancy during their teenage years (Combs et al., 2018). As is true of the general literature on teenage pregnancy, less is known about pregnancy involvement among males in foster care. However, estimates from various samples of Midwestern and Western states suggest that approximately one-quarter of males with experience in foster care contribute to a pregnancy during their teenage years (Combs et al., 2018; Courtney et al., 2016a; Oshima Narendorf, & McMillen, 2016).

Most YFC who become pregnant, go on to become parents. In the samples of young women who were 19 years old in California and the Midwest, roughly two-thirds reported continuing their last pregnancy to a live birth and about 15% chose to terminate the pregnancy (Courtney et al., 2016a; Courtney, Dworsky, Cusick, Havlicek, & Perez, 2007). The Colorado study found that 69% of pregnancies reported by both young women and men with a history of foster care were continued to live births, 18% ended in miscarriage, and 13% ended in abortion (Combs et al., 2018). A statewide analysis of

California birth and child welfare records from 2003 to 2007, which included over 20,000 young women in foster care, provided further data on the rate of childbearing among YFC. Just over one-quarter of females who had been in foster care at age 17 gave birth before the age of 20; more than one-third gave birth at least once before the age of 21 (Putnam-Hornstein & King, 2014; Putnam-Hornstein, Hammond, Eastman, McCroskey, & Webster, 2016). Among females who had a first birth before age 18, 41.2% had a repeat teenage birth (Putnam-Hornstein & King, 2014). This is similar to rates in a sample of young women with a history of foster care in Colorado, where 32% gave birth before the age of 21, and approximately one-third of females who had given birth had done so more than once (Combs et al., 2018).

Studies show that these rates of early parenting among YFC are disproportionately high, even when compared to samples that reflect characteristics common among youth in foster care. Part of the reason for these high rates is likely that youth in foster care have high rates of characteristics that increase the likelihood of teenage pregnancy. Identifying as Latinx or Black, as well as poverty are primary predictors of early pregnancy in the general population, and they are also predictors of being in foster care. Other socio-demographic factors associated with teenage pregnancy include low parental education and family disruption such as divorce or transition to a single parent household (Beers & Hollo, 2009). By definition, all YFC experience some form of family disruption, and lower levels of education among parents of YFC is widely documented (Courtney et al., 2007; Taussig, Harpin, Betts, Melnicoe, & Russo, 2015). A history of child maltreatment has also been shown to contribute to the risk of teenage

pregnancy over and above other sociodemographic risk factors such as poverty and race (Garwood et al., 2015; Putnam-Hornstein, Cederbaum, King, Cleveland, & Needell, 2013; Noll & Shenk, 2013). A recent study using linked child welfare and birth record data from Wisconsin determined that child welfare involved female youth were at significantly greater risk of early parenting as compared to other low income females with similar socio-demographic and family characteristics (Font, Cancian, & Berger, 2019). These findings collectively suggest that youth involved in child welfare services are a unique group at high risk for negative sexual and reproductive health outcomes.

Outcomes of Teenage Parenting

Teenage pregnancy and parenting places young parents at risk of challenges that have clear implications for future generations. Teenage parents are more likely than other teenagers to experience poverty as adults and to evidence more adverse behavioral and physical health outcomes (Ng & Kaye, 2013; U.S. Department of Health and Human Services, 2015). Much attention has been given to the economic and educational outcomes of teenage parents. Only half of females who begin parenting in their teenage years (under age 20) obtain a high school diploma by the age of 22, compared to 89% of those who do not become a parent. Even fewer females (38%) reach high school graduation if they give birth before the age of 18 (Perper, Peterson, & Manlove, 2010). In addition, less than 2% of young women who become parents in their teenage years attain a college degree by age 30 (Ng & Kaye, 2013), and one-third of teenage mothers report that parenting was a primary reason for dropping out of school (Ng & Kaye, 2013). This is in stark contrast to the one-third of women ages 25 and older who have a college

degree (Ryan & Baumann, 2016). While less research has been conducted with teenage fathers, a longitudinal study using a nationally-representative sample found that teenage fathers complete fewer years of schooling and are less likely to obtain a high school diploma than males who did not become fathers as teenagers (Fletcher & Wolfe, 2012). Among a sample in Colorado, males who were parents were less likely to have a high school diploma (Combs et al., 2018).

Becoming a parent as a teenager not only impacts the teenager, but can also have adverse impacts on their offspring. Children born to teenage mothers have higher rates of infant morbidity and mortality, behavioral and cognitive issues, and poverty in adulthood (Beers & Hollo, 2009; Ng & Kaye, 2013). Another highly documented association with young maternal age is increased risk of child maltreatment in the next generation (Beers & Hollo, 2009; Hoffman, 2006; Ng & Kaye, 2013; Putnam-Hornstein & Needell, 2011). Children of teenage mothers are estimated to experience a two-fold increase in risk of abuse and neglect compared to children whose mothers are 20 or older (Hoffman, 2006). The association between teenage parenting and child maltreatment appears particularly strong for teenage mothers who also have a history of being maltreated themselves. A study of over 85,000 children born to adolescent mothers in California found significantly higher rates of maltreatment among children whose mothers were also suspected victims of abuse and neglect (compared to adolescent mothers who had no reports of child maltreatment) (Putnam-Hornstein, Cederbaum, King, Eastman, & Trickett, 2015).

Traditional Prevention Efforts for Teenage Pregnancy

Direct Approaches to Reach Youth. Interventions to decrease teenage and early pregnancy have largely focused on direct education and service provision to youth, and typically approach youth through four main avenues: 1) schools, 2) parents and families, 3) communities, and (4) medical or clinical settings (Beers & Hollo, 2009; Jaccard et al., 2002). In a systematic review of the effectiveness of pregnancy prevention programs between 1989 and 2011, a total of 88 studies that evaluated 78 different interventions underwent sufficient evaluation to be examined (87% were tested in randomized control trials and 13% in quasi-experimental). The interventions fell into five different types or settings: non-clinic based comprehensive sexuality education (47%), non-clinic abstinence-based education (19%), clinic-based services (11%), programs for special populations (11%), and youth development (11%) (Goesling, Colman, Trenholm, Terzian, & Moore, 2014).

The majority of the programs were curriculum-based involving multiple sessions that range from 45 to 60 minutes, and were primarily implemented in schools (29%) and community-based/after school programs (38%). In 2006, Kirby and colleagues identified 17 components of effective sexual health education curricula (Kirby, Laris, & Rolleri, 2006). As shown in Table 1, the 17 components of effective programs included three major areas, which were adopted by the CDC (Kirby et al., 2006).

Table 1

Components of Effective Sexual Health Curricula (Kirby et al., 2006)

Curriculum Development	<ol style="list-style-type: none"> 1. Involved multiple individuals and groups with expertise in design 2. Assessed needs and assets of target population 3. Used a logic model 4. Included activities consistent with community values and resources 5. Pilot-tested
Curriculum content	<ol style="list-style-type: none"> 6. Focused on the prevention of at least one of three health goals (i.e., HIV, STIs, unintended pregnancy) 7. Focused on specific behaviors that lead to health goals, and provided clear messages about addressing situations that might lead to the behaviors 8. Focused on specific sexual psychosocial factors that affect the specified behaviors 9. Sought to create a safe learning environment 10. Included multiple instructionally sound activities designed to change the targeted risk and protective factors 11. Employed instructionally sound teaching methods to actively involve participants, personalize the information, and change risk and protective factors 12. Employed activities and messages that were appropriate to the youths' culture, developmental age, and sexual experience 13. Covered content in a logical sequence
Curriculum implementation	<ol style="list-style-type: none"> 14. Secured support from appropriate authorities 15. Selected educators with desired characteristics, trained them, and provided ongoing support 16. Implemented activities to recruit and retain youth 17. Implemented curricula with reasonable fidelity

An example of a curriculum-based sexual health education program typically implemented in school settings is *Making Proud Choices*, an 8-module curriculum that provides adolescents with the knowledge and skills to reduce their risk of sexually transmitted infections (STIs) and pregnancy by abstaining from sex or using contraceptives. Components of *Making Proud Choices* are typical of other evidence-based sexuality education programs and include: Discussion and activities around values, goals, and future orientation; consequences of sex (e.g., STIs & pregnancy); attitudes about sex and strategies for prevention; developing refusal and negotiation skills. Although the majority of evidence-based pregnancy prevention programs are group based, examples of clinic-based interventions and non-group interventions, which tend to be shorter in duration, include *Seventeen Days*, which consists of a 60-minute video on pregnancy risks, and *Healthy Generations*, which integrates social work services into routine pediatric primary care for young families to ensure that young families are connected to appropriate medical and mental health services (Goesling et al., 2014; Office of Adolescent Health, 2017).

Of the 78 interventions included in the 2014 review, over half (56.4%, n = 44) showed some reductions in teenage pregnancy, STIs, or other sexual risk behaviors (Office of Adolescent Health, 2017). Just as prior review articles had found (Chin et al., 2012; Kohler et al., 2008; Underhill 2007), Goesling et al. concluded that no one specific recipe exists for preventing teenage pregnancy, as a diverse range of program components, approaches and implementation sites were effective in reducing one or more outcomes among various populations. One exception to this is that abstinence-only

education has shown non-significant impacts across multiple reviews on outcomes including contraceptive use, STI, and pregnancy outcomes (Chin et al., 2012; Goesling et al., 2014; Kohler et al., 2008; Underhill 2007). Otherwise, systematic reviews indicate that sex education, clinic-based interventions, and general youth development programs *can* all be effective at preventing teenage pregnancy (Chin et al., 2012; Goesling et al., 2014; Kohler et al., 2008; Underhill 2007). Goesling and colleagues (2014) concluded that the diversity of prevention programs and the varying results from programs that were effective in one population, but not in another, emphasizes the importance of targeting interventions to the unique needs and interests of local communities and specific groups. The need to target interventions to the community is also reflected in Kirby et al.'s (2007) characteristics of effective sex education curricula in developing curricula consistent with community values and available resources, and securing support from the community and local authorities.

While no one clear approach or curriculum is deemed to be most efficacious for all groups, a prerequisite to effective programs is increasing youth access to accurate information and services. Across the wide range of effective prevention efforts, all programs showing impact seek to remove barriers or to provide knowledge, education, or services. The aims of each of these efficacious programs included increasing access to reproductive and sexual health information and healthcare services, and research shows that youth in the general population who are in such programs tend to have safer sexual health outcomes (i.e., later ages of sexual initiation, greater contraception and condom use) (Hall, Moreau, & Trussell, 2012; Jaccard et al., 2002; Lindberg & Maddow-Zimmet,

2012; Lopez, Grey, Chen, Tolley, & Stockton, 2016; Minguéz, Santelli, Gibson, Orr, & Samant, 2015; Widman, Choukas-Bradley, Noar, Nesi, & Garrett, 2016).

Other Approaches to Prevention. Though the bulk of pregnancy prevention programs focus on intervening directly with youth by providing sexual health education or positive youth development curricula, other prevention programs work to change a system in which youth are nested. These approaches emphasize that people are influenced by the systems in which they live, such as their family, community, and schools. Seeking to support these systems in effectively engaging with youth can be a powerful way to approach prevention (Jaccard et al., 2002).

Two very popular approaches include instituting programs for youth at schools (beyond just direct education curricula) and training parents to communicate with youth (Goesling et al., 2014; Jaccard et al., 2002; Sutton, Lasswell, Lanier, & Miller, 2014). For example, placing a reproductive health clinic in the location of a school increases access to information and services for students in those schools, and has been shown to increase contraceptive uptake and decrease rates of teenage pregnancy (Ethier, Dittus, DeRosa, Chung, Martinez, & Kerndt, 2011; Smith, Novello, & Chacko, 2011; Minguéz et al., 2015). One quasi-experimental study that included over 2,000 students measured the reproductive health impact of a school-based health center providing comprehensive sexual and reproductive healthcare in four New York City (NYC) high schools (Minguéz et al., 2015). This study compared schools with the health center to matched high schools that did not have a student health center. Students with access to comprehensive

reproductive health services at their school reported greater use of hormonal contraception.

One of the most widely used pregnancy prevention strategies focuses on increasing parent-child communication (Jaccard et al., 2002). Research documents that parents often avoid talking about sexual and reproductive health with their children because they feel they lack the knowledge and skills to explain sexuality and sexual risks, that it will encourage sexual activity, that their children would not take the conversation seriously, or that they will experience embarrassment (Diiorio, Pluher, & Belcher, 2003; Jaccard et al., 2002). Interventions that target parent-child communication to improve sexual and reproductive health outcomes for youth train parents to communicate with their children about sexual risks such that parents are able to help their children avoid unintended pregnancy or sexually transmitted diseases (Jaccard et al., 2002). Parent-child communication about sexual health has been linked to youth attitudes (Wight & Fullerton, 2013) and safer sex practices such as use of condoms, contraception and abstinence (Diiorio et al., 2003; Jaccard et al., 2002; Harris, Sutherland, & Hutchinson, 2013; Widman et al., 2016).

Interventions for High-Risk Populations. As documented in Goesling et al.'s review, few interventions target particularly vulnerable groups (i.e., youth in shelters, detention, or foster care), and few of the existing programs for special populations have been rigorously evaluated. Efforts have also been made to adapt evidence-based sexual health curricula to the unique needs of special groups; however, such adapted evidence-based curricula have not been rigorously evaluated (Smith, Clark, & Nigg, 2015). One

recent exception to this is *Power Through Choices*, a 10-session sexual health education curriculum for YFC. Outcomes of a 12-month follow-up of the randomized controlled trial with more than 1000 male and female participants in 44 residential group homes in Maryland, California, and Oklahoma found that participants had increased knowledge, and lower rates of sexual activity, unprotected sex, and pregnancy (Covington, Goesling, Tuttle, Crofton, Manlove, Oman, & Vesely, 2016).

Although specialized sexual health education curricula for YFC are desperately needed, multi-session, group-based sexuality education is an approach that is limited in its reach. YFC are often transient and difficult to reach. A multi-session curriculum may be practical and effective in a juvenile justice, residential treatment, or group home setting where youth are a “captive audience;” however, such approaches may have limited reach with youth involved in the child welfare system who are living with biological families or foster parents, and where transportation and scheduling are barriers to consistent attendance (Geiger & Schelbe, 2014).

Traditional Pregnancy Prevention Efforts Often Exclude Youth in Foster Care

Given that YFC have experienced abuse and neglect, and face unique mental health, environmental, and behavioral challenges, a targeted approach is needed (Becker & Barth, 2000; Geiger & Schelbe, 2014). Additionally, YFC often move and change caregivers and schools. As with most topics, youth generally learn about sexual and reproductive health from their family, caregivers, and schools (Jones et al., 2011; Hudson, 2012). As reviewed above, intervening through these traditional systems to either enhance the system or reach youth for direct intervention appears effective in the

general population; however, it is problematic for YFC, as they often experience interruptions in relationships with their school, family, and communities (Constantine, et al., 2009; Geiger & Schelbe, 2014; Hudson, 2012; Love et al., 2005). Rubin and colleagues found that almost half of children who enter foster care remain in unstable living environments for more than 18 months (Rubin, O'Reilly, Hafner, Luan, & Localio, 2007). Such instability creates frequent turnover in caregivers, caseworkers, and living situations, which can inhibit the typical ways that youth learn about sexual health at school or from family and friends (Boonstra, 2011; Jones et al., 2011). In a recent review of 56 articles on sexual health among YFC, Winter and colleagues posited that YFC often miss out on consistent educational experiences and adult relationships through which most youth learn about sexual health and contraception (Winter et al., 2016). While interventions such as parent-child communication training, school-based education, health centers, or programs for youth in schools and community centers have positively impacted teens, it is unclear if these approaches reach YFC as they often miss significant amounts of school, experience difficult parent-child relationships, and may lack relationships with adults who could direct them to such information and services. Studies show pervasively high rates of teenage pregnancy among YFC (Dworsky & Courtney, 2010), as well as evidence that the majority of pregnancies are unintended (Courtney et al., 2016a). A recent study showed that nearly 90% of young adults with a history of foster care did not desire to become pregnant or a parent in the next year (Combs, Brown, Begun, & Taussig, 2018). Such evidence suggests that in addition to the risks that YFC

face that they may also not receive efficacious prevention efforts or may not benefit in the same way as youth who are not in foster care.

Research documents that YFC have less information about basic reproductive and sexual health, face additional barriers to services, and lack confidential sources to discuss sensitive topics than youth in the general population (Becker & Barth, 2000; Constantine, et al., 2009; Geiger & Schelbe, 2014; Hudson, 2012; Love et al., 2005; Robertson, 2013). In a qualitative study of 19 youth who recently emancipated from foster care, participants reported that they did not always have basic information on sexual health (Hudson, 2012). Similar conclusions were made in an assessment of the sexual and reproductive health needs of YFC in three California counties using surveys, interviews and focus groups with a convenience sample of 21 foster youth, 67 child welfare professionals, and five foster parents (Constantine et al., 2009). Participants indicated that school-based sex education is not always available or known to YFC. Caseworkers described that when high school sex education was offered, YFC often did not have the opportunity to participate due to placement changes or caregivers not consenting to their participation (Constantine et al., 2009). In an Illinois study with 37 focus groups comprised of about 150 parenting and non-parenting YFC as well as foster parents, many youth stated that while they received reliable and credible information about sex and contraception from a variety of sources (i.e., the media, schools, religious groups, medical clinics, and social service programs), this information was often too late. For example, some youth mentioned that they were already sexually active before they received any information about pregnancy prevention (Love et al., 2005).

Another theme in this limited literature is that YFC often lack one-on-one support to discuss sensitive topics. When a youth wishes to discuss sensitive topics, the process of navigating and understanding who is a confidential resource amidst multiple systems of medical providers, foster parents, and teachers is confusing (Constantine et al., 2009; Hudson, 2012; Love et al., 2005). In the qualitative study with 19 YFC, participants described feeling uncomfortable accessing services and disclosing such matters to medical and social service professionals, and often being unclear about confidentiality and with whom they could discuss sensitive matters (Hudson, 2012). Though this body of research is limited and primarily involves non-representative samples, it consistently highlights unmet needs for reproductive health education, resources, and access to services for YFC (Constantine et al., 2009; Geiger & Schelbe, 2014; Hudson, 2012; Love et al., 2005; Robertson, 2013).

The Child Welfare System Is Uniquely Positioned to Intervene

For youth involved in child welfare, with inconsistent access to traditional pregnancy prevention and education services, the child welfare system is often the most proximal system through which to intervene. As the primary broker of services for YFC, child welfare is distinctively positioned to fill education and service gaps related to sexual and reproductive health (Garwood et al., 2015; National Campaign to Prevent Teen Pregnancy, 2016; Winter et al., 2016). The child welfare caseworker in particular is well positioned to facilitate services and education either directly, or through foster/biological parents or health care providers. The National Campaign to Prevent Teen and Unintended Pregnancy highlighted child welfare as a primary actor and

intervener in a *Call to Action* regarding pregnancy prevention for YFC (National Campaign to Prevent Teen Pregnancy, 2016). This call urged child welfare caseworkers to engage youth regarding their reproductive health decisions, and to ensure that youth have a trusted adult in their life who is able to talk to them about reproductive and sexual health (National Campaign to Prevent Teen Pregnancy, 2016). Various experts and research studies have echoed this call (Garwood et al., 2015; National Campaign to Prevent Teen Pregnancy, 2016; Winter et al., 2016).

Even more importantly though, studies show that YFC want actors in child welfare, such as caseworkers and foster parents, to be more proactive in addressing sexual and reproductive health with them (Constantine et al., 2009; Love et al., 2005). As stated by teens in a needs assessment of three California counties (Constantine et al., 2009, pg. 28):

“[Social workers should] make it part of a routine. Ask each youth if they know about sex ed. Put a sex ed sheet in each youth’s case file. What does this person know about pregnancy prevention, STDs, and resources”?

“Start talking to youth when they are young so they are used to it, like it's a normal thing to discuss”.

Caseworkers as Facilitators of Services. In general, youth do not seek any type of services or treatment on their own (particularly for services that are sensitive, such as sexual and reproductive health), but tend to be directed to services by their parents, teachers, or other adults (Stiffman et al., 2004). For YFC, child welfare caseworkers are typically the brokers and facilitators of services (Ryan, Garnier, Zyphur, & Zhai, 2006). Ryan and colleagues (2006) argue that the caseworker is a proximal antecedent of child

outcomes in the child welfare system, as they have significant influence over the nature, quality, and amount of benefits and services that the youth receives.

Based on the idea that youth generally obtain services after direction or guidance from an adult, Stiffman and colleagues (2004) developed the Gateway Provider Model to understand youth service access and utilization, by focusing on the individuals who typically identify and suggest services for youth (Stiffman et al., 2004). In this model, a provider's awareness of available services, perception of youths' need, and organizational environments are the primary factors related to the decision to refer for services. Empirical support for this model has been found in various studies showing that service provision was significantly predicted by providers' assessments of need and knowledge of resources (Stiffman et al. 2001; 2002; 2004). For example, in a study with 222 providers, the Gateway Provider Model explained 55% of the variance in the provision of mental health services for youth. Provider perception of need was the strongest predictor, followed by provider knowledge of resources and provider burden (i.e., caseload). The youth's self-reported mental health needs was not significantly associated with service provision, further supporting the theory that service provision is impacted more by need of the child as perceived by the worker (Stiffman et al., 2004).

Interventions to increase caseworkers' capacity to facilitate or broker services for youth involved in the child welfare system have been used to increase access to evidence-based mental health services (Dorsey, Kerns, Trupin, Conover, Berliner, 2012). One example of this is Project Focus, which trained caseworkers to be brokers of evidence-based mental health services. Project Focus was evaluated in multiple areas throughout

the country, including a small quasi-experimental study ($N = 28$) in Colorado. Compared to the comparison group, caseworkers who received the training had significantly greater knowledge of screening instruments, child mental health problems, and evidence-based interventions, (Fitzgerald, Torres, Shipman, Gorrone, Kerns, & Dorsey, 2015). Such research continues to suggest that gateway providers' (e.g., teachers, caseworkers) perception of need, knowledge of risk factors, and familiarity of services are related to connecting a youth to services (Fitzgerald et al., 2015; Stiffman et al., 2004).

Caseworker Communication Regarding Sexual and Reproductive Health.

Though YFC have significant reproductive and sexual health needs and caseworkers are well-positioned to intervene, the limited research in this area suggests that these topics infrequently arise between youth and caseworkers. Constantine and colleagues (2009) surveyed caseworkers and foster parents in three California counties and found that of 33 caseworkers only 23% addressed sexual health topics with male youth and only 34% addressed topics with female youth. In a study with 94 child welfare workers in Kansas, all of the participants reported that communication with adolescents about sexual health was important. However, the large majority (80%) of caseworkers discussed condom use with fewer than 10% of their clients (Pilgrim, 2012). These studies concluded that even though caseworkers think it is important, little communication occurs between caseworkers and youth regarding sexual and reproductive health.

Caseworkers report that they feel both unprepared to engage in these topics, and both need and want more training in this area (Constantine et al., 2009; Courtney et al., 2016b; Dworsky & Dasgupta, 2014; Love et al., 2005). One-third of caseworkers in the

three-county assessment in California felt they did not have adequate training to talk to youth or foster parents about sexual and reproductive health (Constantine et al., 2009). In another study of 295 caseworkers across 47 California counties, caseworkers rated their perceptions of the availability of trainings and services within 13 topics. The topics with the smallest proportion of available services included health education, relationship skills, and pregnancy prevention (Courtney et al., 2016b). Further, sentiments of being unequipped to approach the topic within child welfare is likely compounded by little exposure to reproductive and sexual health issues in social work education, the discipline of which the majority of child welfare caseworkers are trained (Combs & Begun, 2016). In a study of over 500 social work students across the United States, more than 80% noted that topics of contraception, STIs, and abortion were never or rarely discussed in class or in field placements (Combs & Begun, 2016).

Further, gender of the youth as well as demographic match between caseworker and youth appear to be important in communication related to sexual and reproductive health. In two studies of caseworkers, participants were more likely to talk to female clients than male clients about sexual and reproductive health topics (Constantine et al., 2009; Pilgrim, 2012). The tendency to talk with females more than males also appears in the literature on parent-child communication about sexual health risks, as parents are more likely to communicate with their daughters compared to their sons (Diiorio et al., 2003; Harris et al., 2013; Jaccard et al., 2002; Widman et al., 2016). Also mothers are more likely than fathers to discuss sexuality with either of their children (Diiorio et al., 2003; Harris et al., 2013). Additionally, gender match between the adult and youth

appears to be important. Though limited, evidence suggests that when the adult and youth share the same gender, the adult's comfort and efficacy are higher to address topics of sexual health (Constantine et al., 2009; Pilgrim, 2012). Given that the child welfare workforce is more female than male, it raises the question of whether males in foster care are less likely to have an adult discuss sexual health issues with them. These trends highlight the gendered-nature of sexual and reproductive health, which also influences how child welfare professionals approach such topics with their clients.

Training for caseworkers on sexual health. In response to the increased attention on early pregnancy and parenting among YFC, the state of Illinois formed a pregnancy prevention workgroup. In a collaborative effort between the Department of Child and Family Services and the Illinois Caucus for Adolescent Health, 64 foster parents and 94 child welfare workers were surveyed in 2009. Their research found that 89% of foster parents and 71% of child welfare workers wanted more tools and training on communicating about sexual health with foster youth (Dworky & Dasgupta, 2014). As a result, the state of Illinois offered a training on sexual health for caseworkers and foster parents across their state in 2013. An evaluation of this training, which is the only sexual health training for caseworkers and foster parents that has been evaluated, included a convenience sample of 228 caseworkers and foster parents and consisted of pre- and post-training surveys and qualitative interviews (no comparison group). The pre-post test surveys found an improvement in some attitudes and knowledge (particularly for foster parents), however, the pre-test scores were already relatively high, thus a ceiling effect limited the potential to demonstrate change. However, in the qualitative interviews,

researchers found clear and consistent themes that augmented the quantitative data. This study found, primarily drawing from the qualitative interview data, that both discomfort and lack of knowledge around sexual health impeded child welfare workers and foster parents from communicating effectively about pregnancy prevention. The evaluation concluded that there is a pressing need for training, and for research testing the efficacy of this approach with comparison groups (Dworsky & Dasgupta, 2014).

Guiding Framework to Increase Child Welfare Workers' Communication

Regarding Sexual Health

Given this pressing need, understanding the factors associated with child welfare workers' communication about sexual health with YFC, and understanding how to increase their capacity to communicate is essential. The Theory of Planned Behavior (TPB) has proven to be an effective model for understanding, predicting, and changing a wide array of behaviors, including parent-child communication related to sexual health risks (Ajzen, 2006; Stiffman, et al., 2004; McEachan, Conner, Taylor, & Lawton, 2011; Cederbaum, Hutchinson, Duan, & Jemmott, 2013). Additionally, the Gateway Provider Model offers specific contextual relevance to this study, as it is a framework for understanding what influences professionals to direct youth to services (Stiffman et al., 2004). Though the key outcome in the Gateway Provider Model is service brokerage, and the key outcome in this study is broader (i.e., general communication about information or services), given that it was specifically designed with child welfare systems and services in mind, its application to this topic is relevant, and the model offers important additional constructs to consider. Thus, the TPB with additional constructs from the

Gateway Provider Model, provide the theoretical underpinnings for this study and act as a guide for measurement.

The Theory of Planned Behavior. Figure 1 shows Ajzen's original TPB model. In this model, behavior is guided by three beliefs: behavioral, normative, and control beliefs. Behavioral beliefs are a person's attitude toward or about a behavior. Applied to this study, behavioral beliefs include beliefs about the importance or need for discussing sexual and reproductive health with YFC. Normative beliefs (i.e., subjective norms) are produced from one's perception of what others believe about the behavior. For example, applied to this study, subjective norms include child welfare workers' perceptions of what their co-workers or supervisors think about the importance or need for communicating with youth about sexual and reproductive health. Control beliefs (i.e., self-efficacy) are the extent to which one thinks that they are able to carry out the behavior. Applied to this study, self-efficacy includes child welfare workers beliefs about their ability to effectively communicate with YFC about sexual health information or services. Given that comfort is a critical element for adults regarding sexual health topics (Dworsky & Dasgupta, 2014; Jaccard, 2002; Pilgrim, 2012) beliefs about their comfort around sexual health are also captured in self-efficacy.

In the TPB, these three constructs (i.e., behavioral beliefs, subjective norms, and self-efficacy) inform a person's behavioral intention. Behavioral intention attempts to capture the amount of effort a person is willing to spend to implement a behavior, and the actual behavior is the realization of those intentions. Applied to this study, behavioral intentions include whether a child welfare worker intends (or reports that they are

planning) to communicate with a youth about a sexual health topic. Behavior, then, is defined as actually communicating with a youth about any sexual health information, resource, or topic. All TPB constructs are correlated, and in theory, have positive relationships. When the behavioral, normative, and control beliefs are high, the intention to perform the behavior is also high, and thus a person is more likely to carry out the behavior (Ajzen, 1991). Applied to this study, the TPB offers a formula to understand how beliefs and attitudes may impact caseworkers' communication with youth regarding sexual and reproductive health information and services. It also presents a model for designing interventions to increase such communication.

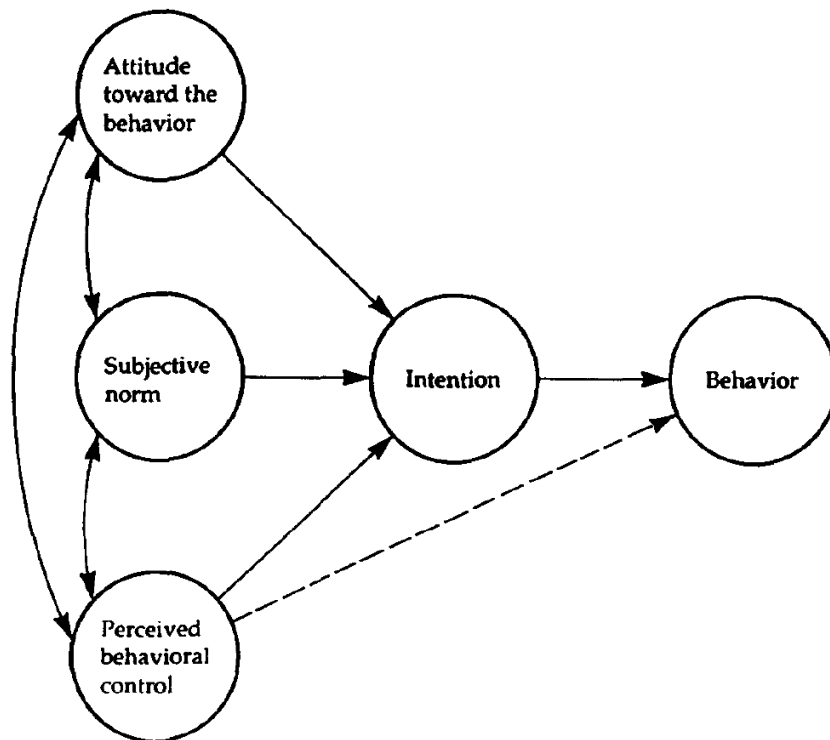


Figure 1. Theory of Planned Behavior (Ajzen, 1991)

Empirical Evidence for the TPB and Communication. The TPB is widely used in the health sciences, and particularly within public health and sexual and reproductive health to explain health-related behaviors and to design interventions (Buhi & Goodson, 2007; McEachan et al., 2011; Trafimow et al., 2002; Tyson, Covey, & Rosenthal, 2014; Webb & Sheeran, 2006). In addition to specific health behaviors and outcomes, the TPB has also been used to predict and to promote communication about sexual health risks between adults and youth (Diiorio et al., 2003; Santa Maria, Markham, Bluethmann, & Mullen 2015; Widman et al., 2016). Studies show that the TPB is an effective way to predict parent-child communication (Cederbaum et al., 2013; Hutchinson, Jemmott, Jemmott, Braverman, & Fong, 2003; Santa Maria et al., 2015; Widman et al., 2016). A specific example of the TPB being used to understand adult-child communication about sexual health risk is Hutchinson and Wood's (2007) Parent-Based Expansion of the TPB. In this example, researchers expanded the TPB to include how a parents' beliefs, subjective norms and efficacy contributes to communication with their child about sexual health risks, and then how that communication influences their child's beliefs, norms, efficacy, and, ultimately, behaviors (Cederbaum et al., 2013; Hutchinson & Wood, 2007).

Potential for TPB Adaptation. Ajzen recognized that the relative importance of behavioral beliefs, subjective norms, and perceived behavioral control in the prediction of intention and behaviors is expected to vary across behaviors and situations (1991). In the original TPB model, Ajzen described that there are external influences and factors that impact behavioral intentions, attitudes and beliefs. Additionally, he noted that the TPB is “open to the inclusion of additional predictors if it can be shown that they capture a

significant proportion of the variance in intention or behavior after the theory's current variables have been taken into account" (Ajzen, 1991, pg 191). While the TPB has enhanced the ability to predict health related behaviors and health-related communication, it primarily includes individual-level factors. External influences create scenarios in which adapted models of the TPB are warranted and strengthen the model. In the application of TPB to caseworkers' communication with YFC, adjustments specific to a child welfare context are warranted. For individuals specifically acting in a professional role and acting as a worker of an agency, additional factors are at play. The Gateway Provider Model offers additional constructs specific to the child welfare context for the behavioral outcome of a child welfare professional communicating with youth about sexual health information and services.

Gateway Provider Model. The Gateway Provider Model is a framework for understanding what leads professionals to link adolescents to care or services. It posits that the provider's perception of need, their knowledge of services, and their environment play important roles in the decision to refer youth to services. Figure 2 displays Stiffman et al.'s model (2004). As described previously, the Gateway Provider Model was developed on the general premise that youth generally obtain services after direction or guidance from an adult, and that certain professionals, such as teachers and caseworkers, act as a gateway to services for youth. Thus, a provider's awareness of available services, perception of youths' need, and organizational environments are primary factors related to their decision to refer for services. While the specific outcome in this current study is different from the original Gateway Provider Model (i.e., general communication about

information and services, versus brokerage of actual services), the model's application to this topic is highly relevant and offers important additional constructs that are not captured in the TPB, specifically caseworkers' perception of youth risk and knowledge of appropriate services.

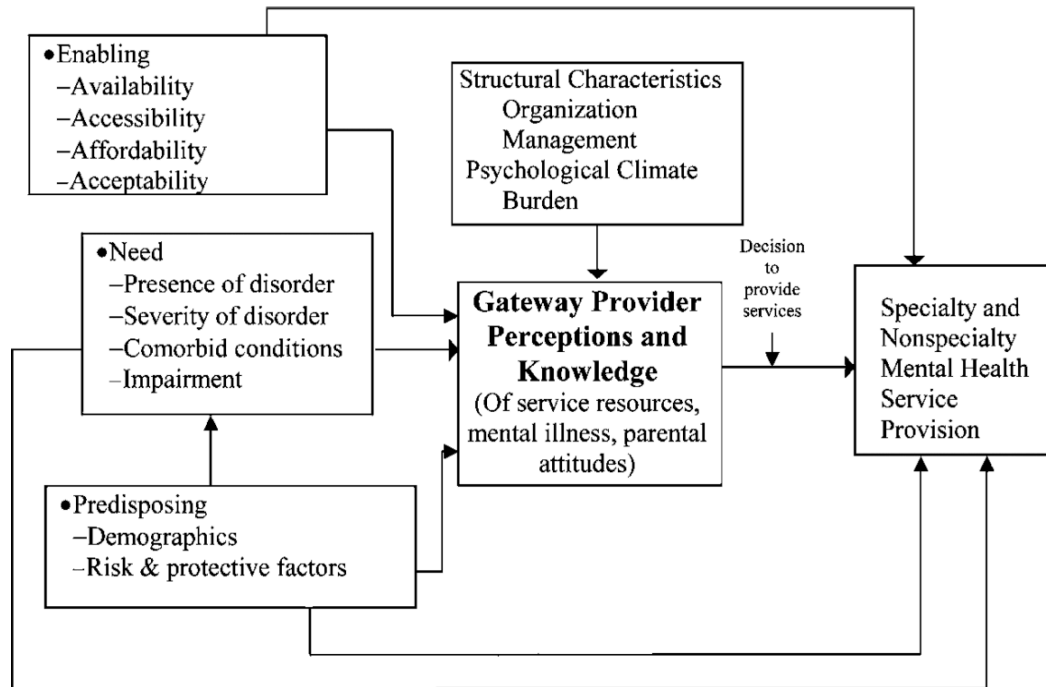


Figure 2. Gateway Provider Service Framework (Stiffman et al., 2004)

While the Gateway Provider Model has not been tested as extensively as the TPB, empirical support for this model has been found in various studies showing that mental health service provision was significantly predicted by providers' assessments of need and knowledge of resources (Stiffman et al., 2000; 2001; 2004). In other words, research suggests that providers who are familiar with community resources, those who are able to identify youth needs, and those who have favorable environmental conditions (e.g., lower

caseload, more organizational support) are more likely to refer for services (Dorsey et al., 2012; Fitzgerald et al., 2015; Stiffman et al., 2004). The Gateway Provider Model has been used to develop interventions, such as the previously described Project Focus, a training that increased caseworkers' capacity to broker evidence-based mental health services for youth involved in child welfare (Dorsey et al., 2012; Fitzgerald et al., 2015).

Framework and Measurement Model for Current Study. The TPB, with the additional constructs from the Gateway Provider Model (i.e., perception of youth risk and knowledge of relevant services), offers a robust framework from which to understand caseworkers' behaviors around communicating with youth involved in child welfare about sexual and reproductive health, and to increase such communication. Figure 3 displayed below shows the current study's theoretical model. For the purposes of this study, the model is also a guide to measuring the constructs (e.g., communicating with youth about sexual/reproductive health, behavioral beliefs, subjective norms), which are described below. In summary, the TPB constructs capture caseworkers' behavioral beliefs related to communicating about sexual and reproductive health topics with youth, subjective norms in the workplace regarding such communication, perceptions of their ability to effectively communicate with youth (i.e., self-efficacy), and their intentions to communicate with youth about sexual and reproductive health topics. The Gateway Provider Model added items on knowledge of services and perception of youth risk (perception of youth risk was included in the TPB behavioral beliefs construct). Knowledge of services was added as a stand-alone construct in the model and focused on knowledge of services, rather than on basic sexual and reproductive health. The reason

for a focus on knowledge of policy and services is due to prior research that shows that caseworker knowledge of sexual health and development is generally high and has little variability (Dworsky & Dasgupta, 2014; Pilgrim, 2012). Also the training that is the focus of the current study was not for caseworkers to become sexual/reproductive health experts, but rather to increase comfort in approaching the subject and to increase their ability to connect youth to appropriate resources and education. The environmental construct in the Gateway Provider Model overlapped with subjective norms. Sexual and reproductive health topics targeted by the sexual health training that were the focus of this study included: a) Methods of pregnancy prevention or contraception (e.g., condoms IUDs, implants, birth control pills), b) Protection against sexually transmitted infections or HIV (e.g., condom use or testing for STIs), c) Healthy romantic and sexual relationships, d) Resources, education, or services (e.g., local clinics/education, pamphlets, or websites).

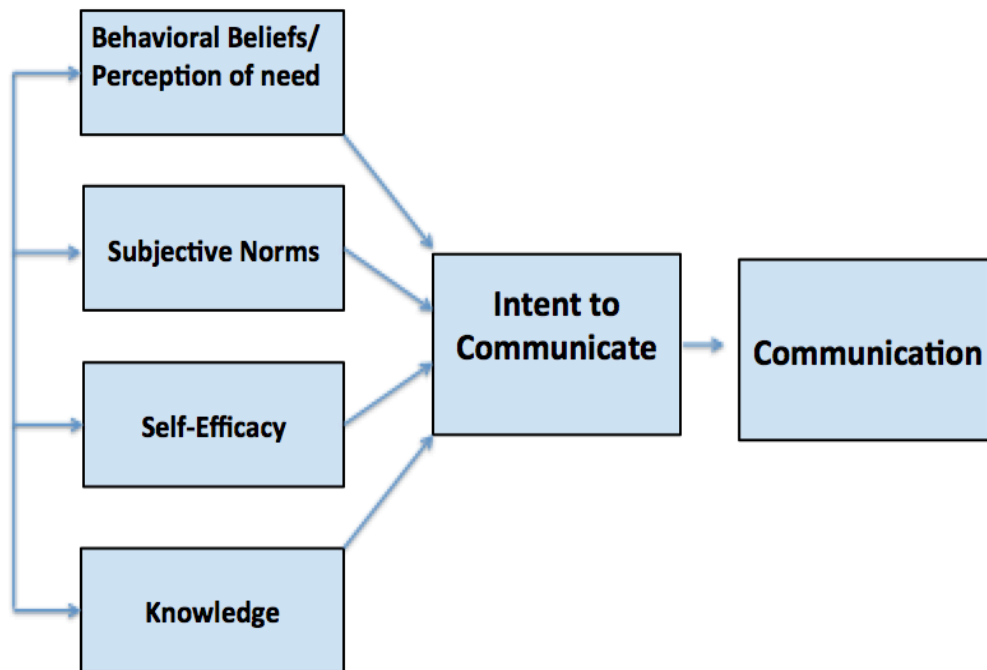


Figure 3. Theoretical Model of factors leading to caseworkers' communication of information and services related to sexual and reproductive Health: Applying the TPB and Gateway Provider Models

Study Context and Aims

As discussed in the introduction, this study includes three major aims, as follows:

- 1) To assess child welfare workers' (a) baseline knowledge about sexual/reproductive health policies and resources for YFC, (b) baseline behavioral beliefs, subjective norms, self-efficacy, and intentions towards communicating with YFC about sexual/reproductive health information and services, (c) baseline levels of communication about topics of sexual and reproductive health with youth on their caseloads over the past month, and (d) demographic differences in baseline knowledge, attitudes and communication.

- 2) To test the relationships between child welfare workers' baseline knowledge of sexual health resources, attitudes towards communicating with YFC about sexual health, and actual communication with youth on their caseloads about sexual/reproductive health information and services.
- 3) To examine the preliminary efficacy of a training to influence child welfare workers' knowledge, attitudes and behaviors related to communicating with youth on their caseloads about sexual/reproductive health information and services.

The Colorado Child Welfare Training System (CWTS) commissioned the current study's principal investigator (PI) to develop a one-day, six and a half hour training for caseworkers on sexual health and development of YFC. This training was available to all child welfare workers in Colorado starting in July 2018, and counted towards their required continuing education hours. This dissertation study used a quasi-experimental design to evaluate the impact of this training. One group of child welfare workers who received the sexual health training were compared to a group of child welfare workers who received other CWTS trainings that occurred at a similar time and in the same region as the sexual health trainings. All participants (in the intervention and comparison conditions) were recruited to complete a pre-training and a three-month post-training survey regarding their knowledge, attitudes, and behaviors related to communicating with youth about sexual and reproductive health information or services.

The Division of Child Welfare Services falls within the Colorado Department of Human Services (CDHS). This division establishes child welfare policy and supervises

the 64 county-administered systems that implement child welfare services. The state of Colorado selected the Kempe Center for the Prevention and Treatment of Child Abuse and Neglect to serve as coordinator of the Child Welfare Training System (CWTS). The CWTS carries out the development and delivery of all trainings for child welfare professionals, para-professionals and families including caseworkers, supervisors, foster parents, and other personnel. The CWTS offers a menu of trainings to caseworkers and foster parents on topics that range from the effects of trauma, group supervision, interviewing skills, and parental substance use.

The CWTS delivers trainings throughout the 64 counties in Colorado through four Regional Learning Centers: the West (Grand Junction or Rifle), Northeast (Fort Collins), Metro (Denver), and Southeast (Cañon City, Pueblo, or Colorado Springs) regional learning centers. New caseworkers and supervisors are required to attend trainings to be certified in their new role. Most of these hours are filled by required or mandated courses, though 13 hours are electives, of which they can choose any training within the CWTS course offerings. To maintain certification, full-time child welfare employees are required to attend 40 hours of in-service training (of their choosing) each fiscal year. The sexual health training was one of the available courses for new and ongoing child welfare caseworkers to meet these required hours.

Chapter Three: Methodology

Procedures

Sampling. All study participants were learners (i.e., child welfare professionals) registered for CWTS trainings between August 2018 and February 2019. Participants self-selected into each training. The intervention group consisted of learners who signed up for one of eight offerings of the sexual health training; the comparison group consisted of registered learners for 18 *date- and region-matched* offerings of other CWTS trainings between August and December 2018, or registered learners in 7 additional *unmatched* comparison trainings. After the implementation of the eight sexual health trainings (and the 18 date- and region-matched comparison trainings) between August and December 2018, an additional group of comparison participants were recruited in order to bolster the sample size to achieve greater representation from smaller regions for the proposed analyses on research Aims 1 and 2 regarding baseline attitudes and behaviors and how they are interrelated. These included registered learners from seven additional comparison trainings that occurred in early February 2019, and were not matched by date and region to an offering of the sexual health training. (These unmatched participants were only included in baseline analyses for research Aims 1 and 2.) Table 2 displays the comparison group trainings matched by date-and-region to each offering of the sexual health training, as well as the seven additional comparison trainings that were not matched to a specific offering of the sexual health training.

Table 2.

Date –and Region-Matched and Unmatched Comparison Group Trainings

Intervention Trainings	Comparison Trainings		
Metro (n = 113)			
August 21, 2018	Safety Through Engagement 8/21/18	Legal Preparation for Caseworkers 8/21/18	Worker Safety 8/24/18
September 5, 2018	CW Response To Trafficking 9/6/18	Confidentiality Bootcamp 9/13/18	Building Safety: Domestic Violence 9/17/18
October 12, 2018	Worker Safety 10/19/18	Creating Healing Attachments 10/22/18	Confidentiality Bootcamp 10/23/18
November 1, 2018	The Invisible Conversation 11/5/18	Cracking the Med Code 11/6/18	Building Safety: Domestic Violence 11/19/18
Unmatched	Building Safety: Mental Illness 2/4/19	Bonding When Broken 2/11/2019	Worker Safety 2/8/2019
Northeast (n = 61)			
October 1, 2018	Building Safety: Domestic Violence 10/9/18	Brain Essentials 10/12/18	
December 3, 2018	Confidentiality Bootcamp 12/12/18		
Unmatched	Confidentiality Bootcamp 2/12/19	Sleep Tight 2/7/19	
West (n = 17)			
October 29, 2018	Building Safety: Domestic Violence 11/9/18		
Unmatched	Worker Safety 2/11/2019		

Southeast (n = 10)			
December 7, 2018	Worker Safety 12/4/18	Accountability & Engagement 12/18/18	
Unmatched	Setting the Foundation 2/7/2019		

Recruitment followed the schedule of the sexual health trainings. Once a sexual health training was scheduled, up to three date- and region-matched comparison group trainings were selected for each of the eight sexual health trainings. Selection criteria for comparison group trainings were based on date and region, and specifically included trainings that: 1) occurred three weeks before or after a sexual health training and 2) were in the same region as the sexual health training. Given that participants in non-sexual health trainings were likely to have less interest in sexual and reproductive health, and hence potentially less interest in study participation, comparison trainings were oversampled in order to achieve a ratio of two potential comparison participants for each intervention participant when possible in order to reach similar numbers of intervention and comparison participants.

As shown in Table 2, in total, four sexual health trainings were held in the Metro region (Denver), two in the Northeast region (Longmont and Fort Collins), one in the Southeast region (Pueblo), and one in the Western region (Grand Junction). The 18 comparison group trainings that were date-and region-matched to these sexual health trainings, and the seven additional unmatched trainings in early February 2019 are listed in Table 2. Though some regions had greater representation, this distribution reflects

Colorado's greater population density, and thus greater number of caseworkers within the state.

Recruitment. The CWTS provided the PI with a list of all individuals registered for the identified trainings. A spreadsheet was used to track recruitment, and included names, course, email address, and study ID (these identifying data were stored separately from survey data). This study tracking spreadsheet allowed for monitoring of learners who registered for more than one training, and ensured that participants did not participate in the study more than once. Though learners never participated in the study more than once, a learner could be *recruited* more than once under different conditions. For example, if a learner was recruited as a comparison participant, but did not respond to the recruitment email in the study, and then later enrolled in a sexual health training, these learners could be recruited as an intervention group participant. If an intervention study participant attended a comparison group training, they were *not* recruited a second time, and no comparison study participants attended a sexual health training at a later date. Once registered learners were verified as not being previous study participants, the PI sent a recruitment email, approximately one week prior to the training, which contained a link to the pre-training survey. The PI sent follow up recruitment emails every two days prior to the start of the training for up to a total of three emails or until they responded.

Every learner who consented and completed the pre-training survey was included in the study and was eligible for the three-month follow-up survey. Three months after the training, the PI sent follow-up emails with a link to the post-training survey. For the

follow-up survey, participants received reminder emails every two to three days until a total of five emails had been sent or the follow-up survey was completed. All participants were compensated with a \$10 e-gift card to Amazon for completing each survey, and surveys took a maximum of 10 minutes to complete (for a total of \$20 possible).

Survey data were collected and managed through REDCap, a secure web application for building and managing online surveys and databases. In order to link pre-training and post-training surveys for this longitudinal study, each learner had a specific and unique link to their survey (rather than a general or public link, allowing for confidential participation). Once the CWTS provided the list of registered learners, the PI added each as a “record” into the REDCap database and assigned each learner a numerical study ID. This allowed the PI to generate a survey link specific to each learner registered for the selected trainings (names of learners were not stored in the REDCap database). The individualized link for the pre-training survey was then copied and pasted into the recruitment email from the PI to each registered learner. Thus, the initial email that went out for study recruitment included this individualized link. From the recruitment email, learners could click on the survey link, and complete and submit the survey electronically. Once a survey was completed, the PI sent the e-gift card incentive to the study participant electronically. Learners who did not consent or start the survey were marked as “non-responders” in the study tracking sheet and their record was deleted from the REDCap database.

Informed Consent. In the recruitment email, the study’s purpose and consent information were described. This description explained that participation and all

responses were confidential, though not anonymous. Given the longitudinal nature of this study, the use of incentives, and collection of potentially identifiable demographic and county information, anonymous participation was not possible. The informed consent section also explained that this study was independent of the state and county child welfare agencies, and that results would only be reported in aggregate. In the recruitment email, the description explained that informed consent would be given by clicking the link and completing the survey, and that the participants who consented and completed the pre-training survey would receive the three-month follow-up survey. The PI's university Institutional Review Board reviewed and approved all study procedures.

Response Rates and Sample Size

As shown in Table 3, the overall recruitment rate was 50.0%; 67.0% in the intervention group and 44.1% in the comparison group. As shown in Figure 4, the flowchart of recruitment, a total of 406 child welfare workers in Colorado signed up for eligible trainings during the study window. Four learners were not recruited due to non-working emails. Of the 402 recruited (103 for the intervention group and 299 for the comparison group), 201 learners consented and completed the pre-training survey; 69 were in the intervention group and 132 were in the comparison group (87 date-and region-matched and 45 unmatched). Given that at recruitment learners were only *registered* for a training and could ultimately decide to not attend their respective training, there were two types of participants in this study: attendees and no shows. Of the 69 participants in the sexual health training, 59 attended the sexual health training and 10 canceled or no showed. For the 132 participants in comparison trainings, 87 attended

the comparison training (58 date-and region-matched and 29 unmatched), and 45 no showed (29 date-and region-matched and 16 unmatched).

Table 3

Recruitment and Pre-training Survey Response Rates by Region

	Overall Recruitment	Intervention	Comparison
All Regions	50.0% (201/402)	67.0% (69/103)	44.1% (132/299)
Metro	45.6% (113/248)	64.4% (38/59)	39.7% (75/189)
Northeast	60.6% (61/94)	74.1% (20/27)	61.2% (41/67)
West	78.6% (17/30)	100% (8/8)	40.9% (9/22)
Southeast	30.0% (10/30)	33.3% (3/9)	33.3% (7/21)

At 3 months post training, 94.2% of participants (n = 147/156) completed the follow-up survey. The 3-month follow up response rates for the intervention group was 91.3% (two of the six non-responding intervention participants no longer had working emails) and the rate was 96.6% for the date-and region-matched comparison participants. Since attrition was quite small, attrition analyses were not conducted.

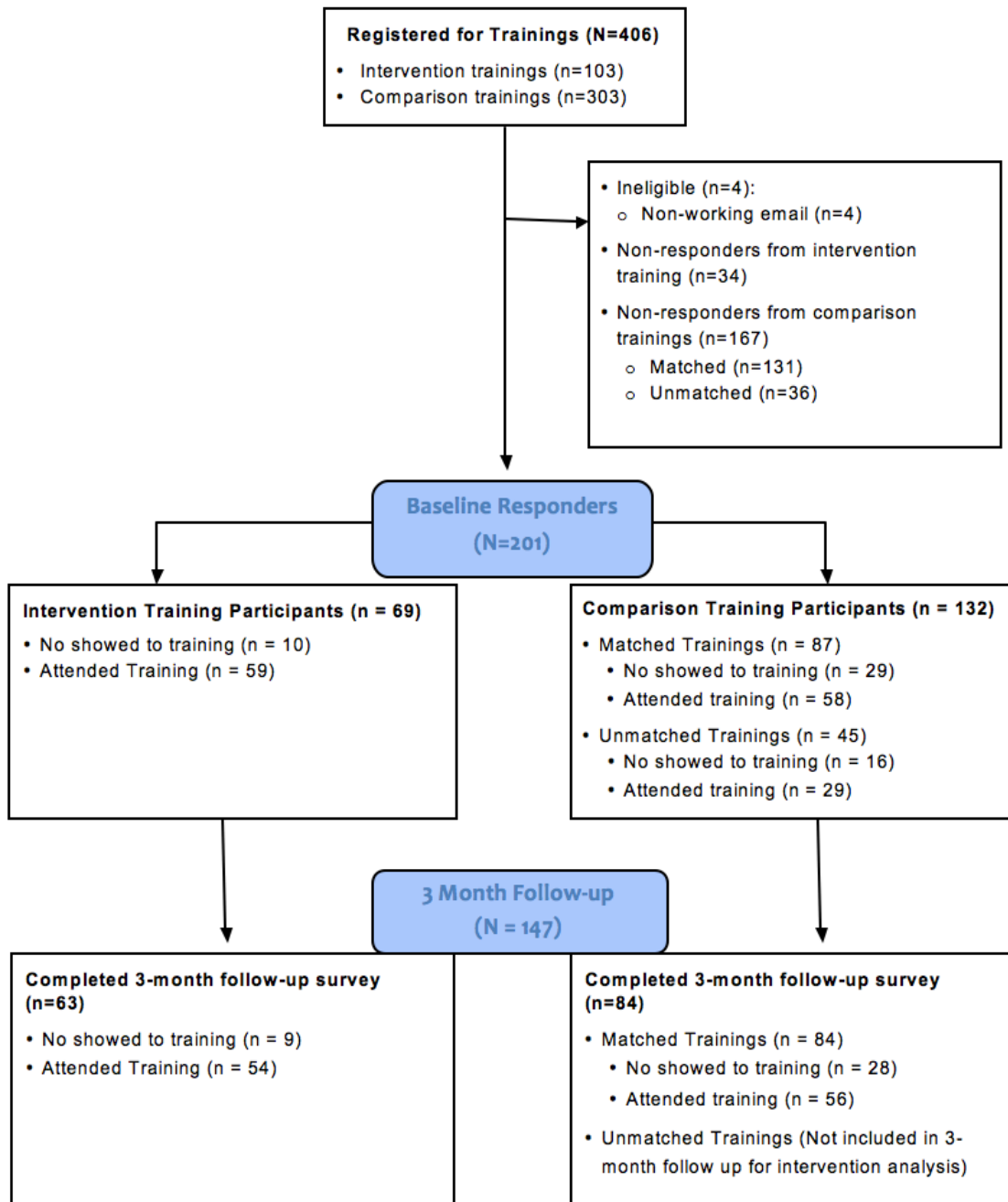


Figure 4. Flowchart diagram of recruitment and response rates

Measures

Surveys included demographic information. Pre-training and three-month post-training surveys asked about caseworkers' knowledge, attitudes, intentions, and past behaviors related to communicating with youth about sexual and reproductive health information and services. Survey items were taken or adapted from various studies that utilized similar constructs and/or measured communication about sexual and reproductive health with youth (Ajzen, 2006; Cederbaum et al., 2013; Dworsky & Dasgupta, 2014; Pilgrim, 2012).

Demographic Variables. Control variables included gender, race/ethnicity, role within child welfare, years of experience in child welfare, highest degree achieved, and discipline (i.e., field of degree).

Gender and race/ethnicity. Gender and race/ethnicity were asked as open-ended questions (i.e., What is your gender? How do you describe your race/ethnicity). Open-ended responses to gender included male, female, and prefer not to answer, which were categorized into female (0), male (1), and missing. Open-ended responses to race/ethnicity/ethnicity were categorized into six categories: White/Caucasian, Hispanic/Latino, Black/African American, Asian, Mixed/Bi-racial, and American Indian. Given the small number in many of the racial categories, a final dichotomous variable was created and used in analyses for race/ethnicity (0 = Non-minority, 1 = Minority).

Child welfare role. Participants were asked "What best describes your primary position/role?" with the following answer options: 1) Case Aid, 2) Caseworker Supervisor and carry cases, 3) Supervisor only, 4) Hotline worker, 5) Hotline supervisor,

6) Other county or state employee, 7) Other. Responses were recoded as follows based on frequencies and whether the role required direct contact with youth: 1) Caseworker/Supervisor with caseload, 2) Supervisor only, 3) Hotline worker/supervisor, 4) Other. Given the small cell sizes in most of these categories, a final dichotomous variable was created and used in analyses, which indicated “caseworker” or direct work with youth (0), and indirect work with youth (1).

Years of experience. Participants were asked, “How long have you worked in the field of child welfare?” and were given answer options on a scale of less than 1 year to 16 or more years, with each year as an independent option that could be selected. Years of experience was dichotomized by a median split ($Md = 3$ years), which resulted in 3 or fewer years of experience (0) and 4 or more years of experience (1).

Highest degree. Participants were asked, “What is the highest degree or level of school you have completed” and were given multiple choice options: 1) High School diploma or GED, 2) Trade or technical school, 3) Some years of college or associates degree, 4) Bachelor's degree, and 5) Graduate degree. Participants selected only categories 1, 4, and 5, and these groups were dichotomized into bachelors or high school degree (0) and graduate degree (1). Though “high school” degree is likely different than having any level of higher education, only two participants fell into this group, and thus it was combined with “bachelors degree.”

Discipline. Participants were asked, “If you received formal training that led to a degree or certificate, what disciplines were you trained in?” The following response options were available: 1) Social Work, 2) Psychology, 3) Child Development, 4)

Education, 5) Counseling, and 6) Other. If participants selected other, they were asked to specify. Ultimately, given that half of the sample was trained in social work, and many categories had small sample sizes, this variable was dichotomized for analyses into social work (0) and other disciplines (1).

Theory-based Constructs. All study variables/constructs assessing knowledge, attitudes, and behaviors were assessed at baseline and at the 3-month follow-up. The major constructs measured followed the TPB, with additional items based on the Gateway Provider Model. Appendix B includes the pre-training and 3-month post-training surveys.

Behavior/Communication. Communicating with youth about sexual and reproductive health was the distal outcome in the measurement model and the main intervention outcome. It was defined as the transference of any information related to reproductive or sexual health education or services to the youth. This definition of communication included behaviors such as providing a handout on reproductive health education or on local services, having a conversation with youth about sexual and reproductive health concerns, or connecting youth to services/education. The behavior/communication construct for this study was developed with adaptations from an evaluation of a sexual health training for caseworkers in Illinois (Dworsky & Dasgupta, 2014), and an adapted version of the Parent-Adolescent Communication Scale (PACS) for caseworkers (Fisher, Davis, Yarber, & Davis, 2009) that was used with caseworkers in a 2012 dissertation study in Kansas (Pilgrim, 2012).

In the evaluation of a sexual health training for caseworkers in Illinois, Dworsky and Dasgupta (2014) asked if caseworkers had *ever* discussed a list of nine sexual/reproductive health topics with youth. As the current study sought to go further than just *ever* discussing a topic, and sought to examine the frequency or commonality of such communication, these items could not be utilized without adaptation. In Pilgrim's (2012) study, the PACS was specifically modified to measure the percentage of one's caseload with whom a child welfare worker discussed specific sexual and reproductive health topics (Pilgrim, 2012). These items were used as a guide for this study, though the sexual and reproductive health topics were modified to include the topics most relevant to the sexual health training, which included:

- a) Methods of pregnancy prevention or contraception (e.g., condoms IUDs, implants, birth control pills),*
- b) Protection against sexually transmitted infections or HIV (e.g., condom use or testing for STIs),*
- c) Healthy romantic and sexual relationships,*
- d) Resources, education, or services (e.g., local clinics/education, pamphlets, or websites).*

The survey first asked for actual estimates of the number of adolescents on their caseload (i.e., *Over the past month, roughly how many adolescents between 12 and 18 years were on your caseload?*). Then the survey asked: *Thinking about the past month, of the adolescents aged 12-18 on your caseload, with approximately how many DID YOU*

COMMUNICATE ABOUT [topics a - d listed above]. Responses to the communication items were divided by the total number of youth on a caseload to create a percentage of the caseload that caseworkers discussed each specific topic (e.g., percent of adolescent caseload with whom caseworker discussed pregnancy prevention). The four communication items had high internal consistency with a Cronbach's alpha of .900. Averaging the percentage scores for the four topics yielded the overall mean communication percentage score. For example, if a participant reported that they had 10 adolescents on their caseload over the past month, and then reported that they communicated with one youth regarding pregnancy prevention, with four regarding STIs, with five regarding healthy relationship, and with 3 regarding resources, they would have communication scores of 10%, 40%, 50%, and 30% for each of the respective topics. Their overall mean communication percentage score would be 30.3%.

Behavioral Intentions. Intent to communicate with youth about information or services was the proximal outcome in the model in Figure 3. These items were adapted from a study on parent-child communication related to sexual risk communication that also used the TPB (Cederbaum et al., 2013). The Cederbaum study asked: *Do you intend to talk to your daughter about sex and abstinence in the next three months?* And *'How likely is it that you will talk to your daughter about HIV/AIDS?* For the purposes of this study with caseworkers who have numerous clients, versus a parent who was asked about their specific child, the items were adapted to the following: *Thinking about the adolescents (ages 12 to 18) on your caseload now, within the next month, roughly HOW MANY DO YOU INTEND to communicate about: a) pregnancy prevention, b) STIs, c)*

healthy relationships, d) resources. Response options included: (0) *None*, (1) *A few*, (2) *Some*, (3) *Most*, (4) *All*. The overall intentions construct had strong internal consistency with a Cronbach's alpha of .949, and the four items were combined as a mean score to create an overall intentions variable for the participants who currently had adolescents on their caseload.

Self-efficacy/Perceived behavioral control. In this model, self-efficacy captured caseworkers' beliefs about whether they were capable and comfortable communicating with youth about sexual and reproductive health topics and resources. A total of eight items were used to measure self-efficacy, which were adapted from resources on constructing TPB measures (Ajzen, 2006) and from a study using TPB within parent-child risk communication (Cederbaum et al., 2013). Items included: *I am CAPABLE of communicating to youth in foster care about a) pregnancy prevention, b) STIs, c) healthy relationships, d) resources*, and *I am COMFORTABLE communicating with youth in foster care about a) pregnancy prevention, b) STIs, c) healthy relationships, d) resources*. Responses options were on a five-point Likert scale (1=Strongly disagree, 5 = Strongly agree). The overall self-efficacy variable had strong reliability with a Cronbach's alpha of .889, and the eight items were combined as a mean score to create an overall self-efficacy variable.

Subjective norms. In this model, subjective norms captured caseworkers' perceptions of what their co-workers and supervisors think about communicating with youth regarding sexual and reproductive health. This subjective norms construct also covers the environmental construct in the Gateway Provider Model. Items measuring this

construct were adapted from Ajzen's worksheet on constructing TPB questionnaires (Ajzen, 2006). Participants rated how much they agreed with the following statements on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree). Items were as follows:

MY PEERS at work believe that caseworkers should communicate and/or help connect youth in foster care to sexual and reproductive health information or services.

MY SUPERVISORS at work believe that caseworkers should communicate and/or help connect youth to sexual and reproductive health information or services.

Sexual/reproductive health discussions regularly arise between youth and caseworkers in my county.

The items had strong reliability with a Cronbach's alpha of .808. The three items were combined as a mean score to create an overall norms variable.

Behavioral beliefs. Applied to this topic, behavioral beliefs referred to caseworkers' attitudes about how acceptable and/or important it is to address sexual and reproductive health topics with YFC. This construct overlapped with perception of youth risk in the Gateway Provider Model, and included items that captured how important the caseworker believed it was to discuss such issues with their clients, if they perceived youth as having sexual health risks and needs, and if they saw these topics within their scope of work. Each of these items were adapted from a TPB questionnaire construction worksheet (Ajzen, 2006). Participants rated how much they agreed with the below

statements on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree). The specific items were as follows:

I believe that youth in foster care HAVE A NEED for education and/or services related to [topics: a) pregnancy prevention, b) STIs, c) healthy relationships]:

I believe that CASEWORKERS SHOULD COMMUNICATE with youth in foster care about [topics: a) pregnancy prevention, b) STIs, c) healthy relationships, d) resources]:

The seven items had strong reliability with a Cronbach's alpha of .902, and were combined as a mean score to create a behavioral beliefs construct.

Knowledge of services. Knowledge items included four items regarding services and reproductive health policies. The indicators of knowledge were correct answers to two separate questions about the age of consent for contraception. The below question was asked about 13 year-olds and 17 year olds: *At age 13/17, youth can access reproductive health services confidentially and without parental/guardian consent in CO* [True/false]. True/false answers were recoded to indicate correct answers, and open-ended responses were recoded as "1" to indicate that a specific resource was identified and "0" to indicate "Don't Know" or a non-specific answer (e.g., "any medical provider," "internet," or "google"). Participants were also asked two separate questions about specific resources. In the first they were asked to name a specific local resource or clinic, and in the second they were asked to name an online resources or educational material. The four knowledge items were summed to create an overall knowledge score that indicated the percentage of "correct" answers and ranged for 0 to 4.

Additional items. Given that gender match between the youth and worker appears to be a significant variable in communication about sexual and reproductive health in the literature, the two questions below were asked regarding gender match. These additional items were:

Communicating with adolescents of the same gender as I am about the sexual/reproductive health topics above is... [1 = Very uncomfortable, 5 = Very comfortable]

Communicating with adolescents of a different gender than I am about the sexual/reproductive health topics above is... [1 = Very uncomfortable, 5 = Very comfortable]

Sexual Health Training

The CWTS hired the principal investigator (PI) of this study to develop and facilitate a training on sexual health and development of YFC. The training, entitled *Sexual Health Fluency: Resources for Communicating about Sexual Health with Youth and Caregivers*, had three major objectives: 1) to help learners understand and recognize sexual and reproductive health risks for YFC, 2) to become familiar with and explore relevant online and local resources and services, and 3) to build comfort and skills in communicating about these topics. The training used a problem-based learning (PBL) approach, in which learners are not simply presented with information, but are presented with questions, problems, or scenarios through which they must explore and find answers and solutions. PBL aligns with the TPB as the purpose of a more engaged process is to focus less on specific information transference, and instead to allow learners to engage

with topics in a way that changes attitudes and beliefs, as well as build skills (i.e., self-efficacy) through interactive activities. Table 4 below displays how the three aims of the training map onto core content and facilitation techniques utilized. The training utilized a range of case study, teach-back, and reflection activities to create opportunities for learners to explore sexual and reproductive health risks specific to YFC, resources available, and options for communicating with YFC and their caregivers.

Table 4

Sexual Health Training: Goals, Core Content, and Facilitation Techniques

Goal	Core Content	Facilitation techniques
Recognize risks	<ul style="list-style-type: none"> • Explore sexual and reproductive health risks specific to YFC (e.g., Elevated rates of pregnancy/STIs, impact of trauma on development, lack of trusted adults • Recognize range of values around sexual and reproductive health • Age-appropriate healthy development 	<ul style="list-style-type: none"> • Free Writing • Reflection and discussion • Case studies • Interactive activities • Teach back
Become familiar with resources	<ul style="list-style-type: none"> • Policies, and local and online resources (e.g., Laws of consent, teen-friendly clinics, web resources for youth & parents) • Basic health information related to sexuality and reproduction (e.g., contraception & STIs) 	<ul style="list-style-type: none"> • Interactive activities • Short lecture • Case studies • Teach back
Build comfort and skills	<ul style="list-style-type: none"> • Starting a difficult conversation • Answering difficult questions • Practicing conversations 	<ul style="list-style-type: none"> • Case studies • Role plays

Below is the course description as it reads in the CWTS course catalog:

Sexual health is essential for all people, yet it can be uncomfortable to discuss, surrounded by cultural, personal, and religious taboos. For youth involved in child welfare services—who experience disproportionate rates of sexual health

issues compared to other teens, in addition to a mountain of other challenges—the need to learn about sexual health is even more critical, and it’s imperative that we overcome our own discomfort around these conversations.

Youth in care not only experience trauma, which can impact their sexual development, but they also all too often miss out on traditional sexual health education that other students get in school and from their families. This course will empower learners to facilitate trauma-informed discussions around healthy sexual development with both youth and caregivers.

In this training, learners will

- *consider their own values around sexual health and the importance of respecting others’ values,*
- *explore sexual health needs and risks related to youth involved in foster care,*
- *investigate local and online sexual health resources and services available to youth, and*
- *practice talking with confidence about sexual health with youth and caregivers through a trauma-informed lens.*

The training maps onto this study’s guiding framework in the following ways:

Behavioral beliefs and perception of need. A portion of the training is dedicated to encouraging learners to reflect on their own beliefs and perceptions of youth’s needs regarding sexual and reproductive health. This is achieved through a free writing activity, discussions, and case studies. In the free writing activity, learners reflect on the messages

they received around sexual and reproductive health as a teen, what they would have liked to have been different, and how similar or different the risks are for the youth with whom they work. Discussions around those questions are framed by considering how trauma impacts sexual health risks and development. Learners also participate in a values activity designed to help them identify their own values, and develop empathy and understanding for others' values and beliefs. Through case studies, learners consider how values may interfere, encourage, or change how child welfare practitioners interact with youth related to sexual health risks and needs.

Subjective norms. Subjective norms are not directly addressed in this training intervention. However, having a training from the CWTS endorsing communication about sexual and reproductive health likely impacts the perception that addressing these topics with youth and/or caregivers is important and supported by the leaders in the Colorado child welfare system at large.

Self-efficacy. A large component of the training is dedicated to building self-efficacy and practicing skills to communicate with youth and caregivers. Components throughout the training aim to increase self-efficacy. For example, learners develop strategies related to how adults can show support to youth in each stage of growth and development. They also participate in an activity to rephrase common sexual health language that can be stigmatizing, especially to youth who have experience abuse and neglect. This activity specifically aims to increase skills and garner confidence in addressing these topics with youth who have experienced trauma. Also, learners practice locating relevant resources and policies relevant to youth in case studies with varying

risks and needs. Finally, learners brainstorm ways to start conversations and responses to common questions from teens about sexual and reproductive health. They also role-play starting and having a conversations with youth and caregivers from the case studies.

Knowledge. The training includes components that aim to increase learners knowledge of healthy development from birth to young adulthood, as well as knowledge of sexual and reproductive health services, resources, and policies relevant to youth. In module two learners explore age-appropriate sexual development, which provides a context for relevant and appropriate services for youth. In module four, learners participate in a “live poll,” in which they see aggregate answers from the group in real time that assesses current knowledge of various policies and resources available to youth. This live poll acts as a springboard for additional information and discussion. Learners are then provided with materials on contraception, STIs, and online and local resources and services. Through case studies, learners explore these resources and identify information and services appropriate for youth with specific needs/risks.

Analyses

Missing Data. A total of 5.5% of participants had missing data on one or more of the demographic or control variables. The variable with the highest amount of missingness was race/ethnicity with 3.5% ($n = 7$) missing. Less than 2% of participants had missing data on gender, education, and highest degree. There was no missingness for years of experience or discipline. Though some missingness existed on specific items within a theory-based construct, there was no missingness for any of the mean construct scores (at baseline or the 3-month follow-up). Two of the six theory-based constructs

depended on having a current or past month caseload of adolescents (i.e., intentions and communication, respectively), which was not the case for all participants and in their cases items on intentions and communication were not applicable or logical skips. At baseline, 121 (60.1%) participants had a current caseload with adolescents, 114 (56.7%) had a past month caseload with adolescents, and 129 (64.2%) had either a current or past month caseload of adolescents. Of the 156 participants included in the 3-month follow-up, 102 (65.4%) had a current caseload with adolescents, and 95 (60.9%) had a past month caseload with adolescents. The approach to handling missingness is described below for research aim.

Research Aim 1. For Aim 1 regarding baseline knowledge, attitudes, and communication about sexual/reproductive health, descriptive statistics were run on each of the control variables and baseline theory-based constructs. All continuous variables were also examined for normality, and all 201 cases (including unmatched comparison participants) were utilized to explore questions related to baseline data. Additionally, bivariate analyses were conducted to explore relationships with each of these dependent constructs and demographic factors. Specifically *t*-tests were conducted on the baseline constructs by each of the categorical demographic variables (e.g., gender, degree, and race/ethnicity).

Research Aim 2. For Aim 2, a path model estimated within a structural equation modeling framework was conducted to test the direct and indirect relationships between baseline theory-based constructs (i.e., behavioral beliefs, subjective norms, self-efficacy, knowledge, intentions, and communication). Path analyses were conducted in Mplus

version 8 (Muthén & Muthén, 1998-2017). While Figure 3 represents the study's theoretical or conceptual model, Figure 5 displays all relationships tested, including controls, in the path analysis. In other words, the path model tested the hypothesized relationships including direct and indirect effects among each observed baseline variable in Figure 5. Path analysis is essentially an extension of multiple regression models. Path models go beyond regression by allowing for multiple dependent variables and the ability to test for "chains" of influence. Path analysis is advantageous for simultaneously testing relationships among manifest predictors and outcomes, and to account for co-variation between variables and provide more accurate estimations of error when running regressions on multiple outcomes (Streiner, 2005).

For the path model, the sample included all baseline participants (including unmatched comparison participants). However, as this aim was to assess how knowledge and attitudes related to intentions and communication, the sample for the path analysis was limited to those who had a current or past month adolescent caseload and could therefore answer the intentions and communication items ($n = 129$).

This sample size of 129 falls in the "small" range when considering sample sizes appropriate for path analysis within a structural equation model (SEM) (Kline, 2011). A sample size of 200 is frequently recommended, while 100 is often considered the minimum for conducting SEM (Tabachnick and Fidell, 2001; Kline, 2011). Though this is a relatively small sample size, evidence suggests that simple models with normally distributed data can be meaningfully tested even if sample size is small. Observed

constructs showed acceptable normality in regards to skewness and kurtosis, thus satisfying structural equation modeling normality assumptions (Kline, 2011).

Figure 5 displays all of the relationships tested. Building of the path analysis model began by regressing baseline behavioral beliefs, subjective norms, self-efficacy, and knowledge on the six control variables and group status (though group status is not a demographic variable, it serves as a proxy of interest and motivation around the topic of sexual health, and was thus included as a control.) Then, intentions to communicate were regressed on baseline behavioral beliefs, subjective norms, self-efficacy, and knowledge (which were correlated). Finally, baseline communication was regressed on behavioral beliefs, subjective norms, self-efficacy, knowledge, and intentions. Model fit was assessed through the chi-square test of model fit, the comparative fit index (CFI), the Tucker Lewis Index (TLI), and the root-mean-square error of approximation (RMSEA). Non-significant chi-squares, CFI values of .9 or higher, TLI values of .95 or higher, and RMSEA values of .05 or lower are generally considered as demonstrating good fit (Hu & Bentler, 1999).

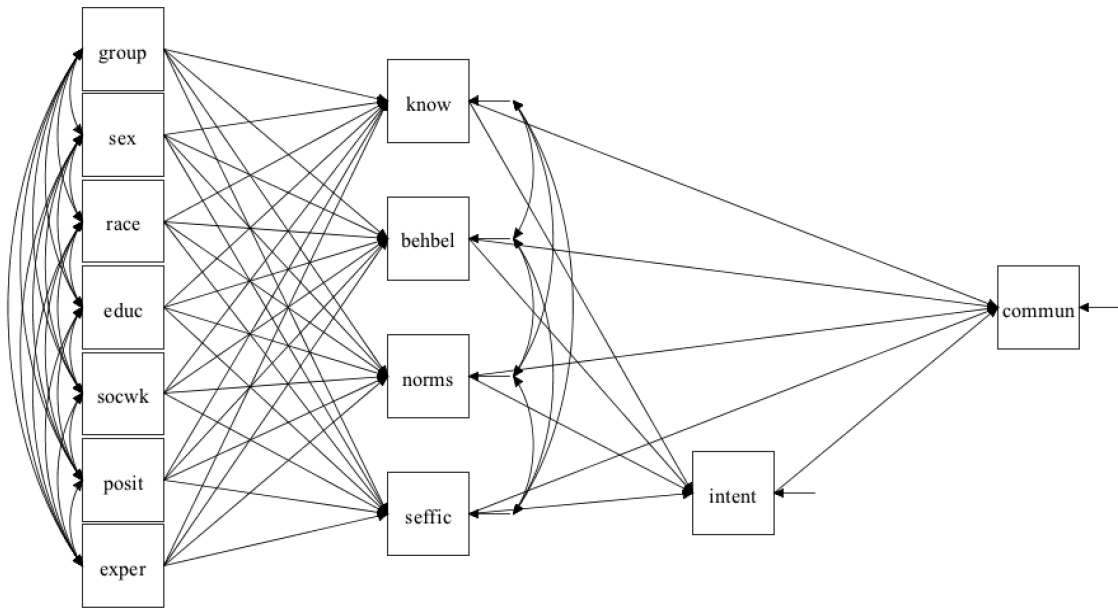


Figure 5. Path analysis model diagram of relationships tested

Research Aim 3. For Aim 3 examining efficacy of the training, baseline differences were explored by group status (i.e., intervention versus comparison) and by training attendance (i.e., attended or no showed). Specifically, chi-square tests were conducted to examine differences between these groups on dichotomous demographic variables, and *t*-tests were conducted to examine differences on the continuous theory-based constructs. After assessing for any differences between the groups, differences were explored between the intervention and date-and region-matched comparison participants at the 3-month follow-up on each of the model's constructs through regressions that controlled for the baseline measure of the respective construct. An intent-to-treat model was used to assess this aim and the unmatched comparison participants were excluded. Regressions on 3-month follow up behavioral beliefs, subjective norms, self-efficacy, and knowledge included 147 participants; the regression on intentions included 82 participants, and the regression on communication included 79 participants.

Chapter Four: Results

Research Aim 1. Baseline Characteristics

Baseline Descriptive Statistics. Table 5 displays demographics of the full baseline sample. Overall, participants primarily identified as female/woman and as White/Caucasian; 17.5% identified as Hispanic/Latino, 5.2% as Black/African American, 3.1% as Asian, and 2.6% as multi-racial. Most participants were child welfare caseworkers having direct or somewhat regular contact with youth; 14.0% were supervisors or hotline workers who did not carry their own cases, and 17.0% held other roles such as staff at a residential treatment center, guardians ad litem, case aids, or administrators/trainers. About half of participants had 4 or more years of experience in child welfare; more specifically, roughly one-fifth (21.6%) of the sample had one year or less of experience, about half (48.9%) had 2 to 9 years, and one-quarter (29.7%) had 10 or more years of experience as a child welfare professional. Over half of the sample had a high school or bachelor's degree, and just less than half had a graduate degree. The majority of degrees were from programs of Social Work (46.7%), Psychology (22.8%), or Sociology/Criminal Justice (12.7%); other degrees included Counseling, Education, Human Development, and Law.

Table 5

Baseline Descriptive Statistics of Demographics and Theory-based Constructs (N = 201)

Demographics	N	%
Gender (n=197)		
Female	186	94.4%
Males	11	5.6%
Race (n=194)		
White	137	70.6%
Non-White	57	29.4%
Position (n=201)		
Caseworker	138	68.7%
Other	63	31.3%
Experience (n=201)		
< 4 years	75	48.1%
> 4 years	81	51.9%
Highest degree (n=200)		
Bachelors or HS	115	57.5%
Graduate degree	85	42.5%
Discipline (n=197)		
Social work	91	46.2%
Other	106	53.8%
<hr/>		
Baseline Theory-based Constructs	N	M (sd)
Knowledge	201	2.53 (.87)
Behavioral beliefs (7 items)	201	4.42 (.61)
Self-efficacy (7 items)	200	4.20 (.57)
Subjective Norms (3 items)	201	3.47 (.73)
Intentions to communicate (4 items)	121	1.66 (1.24)
% of caseload with whom caseworkers Communicated (4 items)	114	23.6% (.30)

Table 5 also displays descriptive statistics at baseline for the theory-based constructs. Participants provided correct answers to an average of 2.53 of the four knowledge items. Only about one-third (38.3%) of the sample knew that a 13-year old could confidentially access contraceptive services without guardian/parental consent,

while the majority (93.0%) knew that a 17-year old could. Though 84.1% were able to name a local resource or clinic, just 37.3% were able to name an educational resource for youth or caregivers.

Behavioral beliefs that youth needed sexual health information and that caseworkers should communicate about such topics were high with a mean score of 4.42 out of a possible range of 0 to 5. Mean scores on individual items regarding whether caseworkers should discuss specific topics ranged from 4.09 ($SD = .89$) for pregnancy prevention to 4.72 ($SD = .74$) for resources and education (with the highest possible score being 5). Mean scores on individual items regarding youth risk or need for such information ranged from 4.68 ($SD = .64$) on pregnancy prevention to 4.72 ($SD = .62$) on STIs.

Self-efficacy was also high with a mean score of 4.20 out of possible range of 0 to 5. Individual items regarding comfort in communicating ranged from a mean of 4.06 ($SD = .82$) on pregnancy prevention to 4.24 ($SD = .76$) on resources/services. Individual items regarding capability of communicating ranged from a mean of 4.24 ($SD = .719$) on pregnancy prevention to 4.32 ($SD = .63$) on healthy relationships.

Caseworkers' perceptions of subjective norms were lower, with an average score of 3.47. Individual item means ranged from 3.19 ($SD = .89$) on discussions arising regularly to 3.63 on supervisors believing that caseworkers should communicate.

The mean intention to communicate score among participants with a current caseload ($n = 121$, 60.2% of the full sample) was 1.66, representing a response of intending to communicate with a *few* to *some* of youth on a caseload. Individual items

had average scores of 1.53 ($SD = 1.38$) for the topic of STIs, 1.61 ($SD = 1.33$) for pregnancy prevention, 1.64 ($SD = 1.31$) for resources/services, and 1.87 ($SD = 1.36$) for healthy relationships.

For the 114 participants who had adolescents on their caseload in the past month (56.7% of the full sample), the average number of adolescents was 6.71 ($SD = 7.90$). These caseworkers discussed the topics with an average of 23.6% of their caseload. Education or services available at local clinics or online was discussed with the smallest proportion of caseloads (18.7%) and healthy romantic and sexual relationships was discussed with the highest proportion of caseloads (32.5%). Participants with caseloads discussed pregnancy prevention or STIs with 21.0% and 21.3% of their caseloads, respectively.

For the additional questions related to gender match between youth and worker, on a scale of 1 (very uncomfortable) to 5 (very comfortable), the average score for communicating with adolescents of the same gender was 3.77 ($SD = 1.06$) and the average score of communicating with adolescents of a different gender was 3.29 ($SD = 1.07$). The score for communicating with adolescents of a different gender was statistically lower than the score for the same gender ($m_{diff} = .49$, $t = 7.21$, $df = 195$, $p < .001$).

Associations between Demographic Characteristics and Baseline Construct Scores. Differences in baseline mean construct scores by the six demographic variables were explored through *t*-tests. A total of 36 *t*-tests were conducted to test for differences on the six baseline constructs by the six demographic variables. Given the number of

tests on the same baseline constructs, and because the probability of identifying at least one significant difference due to chance increases as more tests are conducted, a Bonferroni correction was made. Bonferroni corrections reduce the chances of obtaining false-positive results (type I errors) when multiple pair wise tests are performed on a single set of data. With Bonferroni corrections, no differences were found by demographic variables on baseline construct scores.

Research Aim 2: Interrelationships Between Theory-based Constructs

To examine the relationships between baseline constructs in Figure 5, path analysis was conducted to estimate direct and indirect effects. Table 6 displays the correlation matrix of all baseline constructs, and shows that constructs were positively associated with one another, though not all were significant. In the path model, behavioral beliefs, subjective norms, self-efficacy, and knowledge were regressed on the six control variables and group status; intentions were regressed on behavioral beliefs, subjective norms, self-efficacy, and knowledge; and then communication was regressed on knowledge, behavioral beliefs, subjective norms, self-efficacy, and intentions.

Figure 6 is a visual of the significant path results with solid lines representing the significant relationships at the .05 level, and dashed lines representing statistical trends ($.10 > p > .05$). The chi-square test of model fit showed that the data adequately fit the model, $\chi^2(14) = 15.24$ $p = .362$. The CFI, TLI and RMSEA analysis further confirmed this (CFI = .989, TLI = .956, RMSEA = .027). The overall model accounted for 22.8% of variance in intentions to communicate, and 26.5% of the variance in communication (Figure 6).

Table 6

Correlation Matrix of Baseline Theory-based Constructs

		Know- ledge	Behav. Beliefs	Self- efficacy	Subject. Norms	Intent	Com muni cation
Knowledge	<i>r</i>	1.00					
	<i>N</i>						
Behavioral Beliefs	<i>r</i>	0.06	1.00				
	<i>N</i>	201					
Self- Efficacy	<i>r</i>	0.21**	0.41***	1.00			
	<i>N</i>	200	200				
Subjective Norms	<i>r</i>	0.08	0.42***	0.28***	1.00		
	<i>N</i>	201	201	200			
Intentions	<i>r</i>	0.10	0.24**	0.35***	0.43***	1.00	
	<i>N</i>	121	121	121	121		
Communi- cation	<i>r</i>	0.25**	0.11	0.34***	0.20*	0.47***	1.00
	<i>N</i>	114	114	114	114	109	

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

Direct Effects. Table 7 displays the raw and standardized coefficients for direct effects in the model and Figure 6 is a visual of direct effects with solid lines indicating significant associations. Path model results show that subjective norms and self-efficacy were significant predictors of intentions to communicate with adolescents currently on one's caseload. Every one-point increase on subjective norms and self-efficacy was associated with a .520 and .626 increase, respectively, on the intentions score. Behavioral beliefs and knowledge, when considered alongside subjective norms and self-efficacy,

were not significant predictors of intentions. For communication, knowledge had a statistical trend of a direct effect on communication ($p = .068$), though not significant at the .05 level, and only intentions had significant direct effects. For every one-point increase on the intentions score, the percentage of one's caseload with whom a professional communicated increased by 40 percentage points. All other attitudes, when considered alongside intentions, did not significantly predict communication.

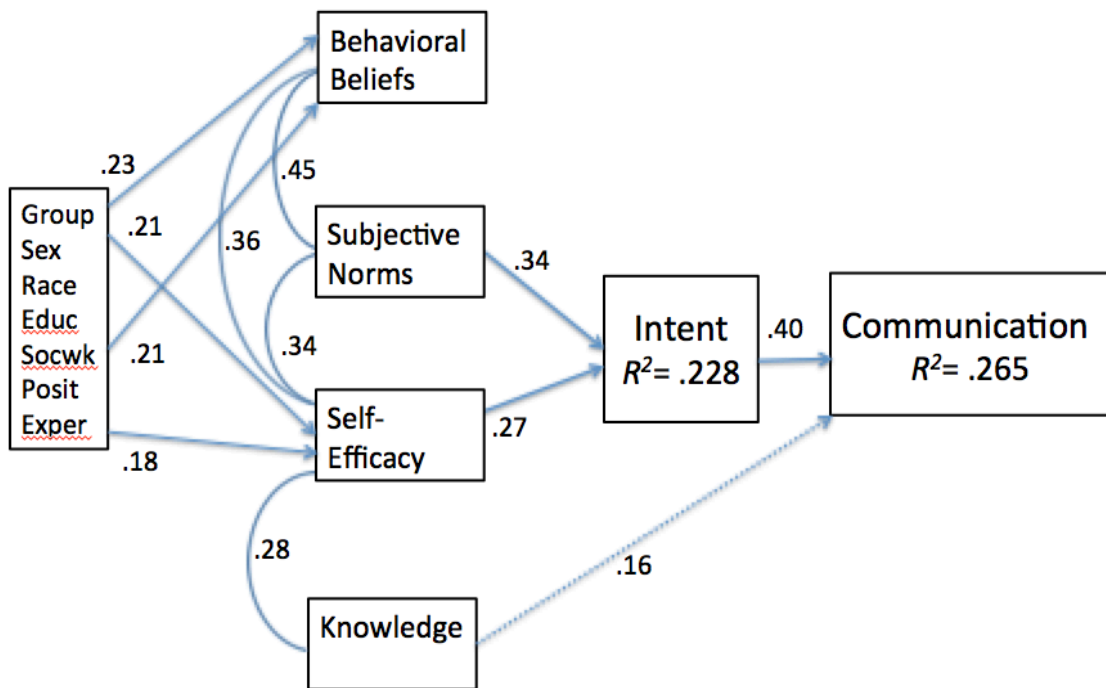


Figure 6. Path analysis diagram with standardized coefficients for significant associations at the $p < .05$ level shown in solid lines and trends at the $p < .10$ level shown in dotted lines.

Table 7

Path Coefficients for All Relationships Tested in Figure 5 (N = 129)

	B	SE	β	<i>p</i>	<i>r-squared</i>
Behavioral Beliefs on					.110
Group	0.275	0.107	0.231	*	
Sex	-0.185	0.189	-0.085		
Race	0.096	0.107	0.079		
Education	0.201	0.112	0.171		
Social Work	0.241	0.113	0.209	**	
Caseworker	0.007	0.169	0.003		
Experience	-0.189	0.105	-0.163		
Subjective Norms on					.028
Group	0.190	0.153	0.117		
Sex	-0.134	0.270	-0.045		
Race	0.087	0.152	0.053		
Education	-0.077	0.152	-0.048		
Social Work	-0.015	0.162	-0.010		
Caseworker	-0.070	0.241	-0.027		
Experience	0.103	0.149	0.065		
Self-Efficacy on					.106
Group	0.228	0.096	0.214	*	
Sex	-0.153	0.170	-0.078		
Race	-0.030	0.096	-0.027		
Education	0.023	0.100	0.022		
Social Work	0.096	0.102	0.093		
Caseworker	-0.158	0.152	-0.092		
Experience	0.183	0.094	0.176		

Knowledge on					.024
Group	0.004	0.161	0.002		
Sex	0.164	0.285	0.052		
Race	-0.053	0.16	-0.030		
Education	-0.017	0.168	-0.010		
Social Work	-0.044	0.171	-0.026		
Caseworker	-0.374	0.254	-0.136		
Experience	0.011	0.157	0.006		
Intentions on					.228
Beh Beliefs	-0.133	0.095	-0.064		
Subj Norms	0.520	0.090	0.340	***	
Self-Efficacy	0.626	0.092	0.269	**	
Knowledge	0.005	0.085	0.004		
Communication on					.265
Beh Beliefs	-0.008	0.095	-0.016		
Subj Norms	-0.014	0.100	-0.037		
Self-Efficacy	0.093	0.100	0.159		
Knowledge	0.058	0.086	0.158		
Intent	0.101	0.089	0.400	***	

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

Indirect effects. Given the significant relationships between subjective norms, self-efficacy and intentions, indirect effects and total effects (derived from the sum of indirect and direct effects) of subjective norms and self-efficacy on communication through intentions were examined. Indirect effects ($B_{\text{indirect}} = .063$, $SE = .027$, $p = .019$) and total effects ($B_{\text{total}} = .156$, $SE = .061$, $p = .010$) were statistically significant for self-efficacy. The indirect effect of self-efficacy on communication indicated that for every

one-point increase in self-efficacy, the percentage of caseload with whom a professional communicated increased 6.3 percentage points. The *non*-significant direct effect of self-efficacy on communication and the *significant* indirect effect, suggests that the total effect of self-efficacy on communications is mediated by intentions. For subjective norms, indirect effects were significant (coefficient_{indirect} = .052, *SE* = .019, *p* = .006), but the total effects were not (coefficient_{total} = .038, *SE* = .039, *p* = .331). It is not uncommon for an indirect and direct effect to be in opposite direction, and thus result in a smaller or non-significant total effect. Since the total effect (direct + indirect) is not significant, we cannot conclude that intentions mediate the effect of subjective norms on communication.

Research Aim 3: Intervention Associations

Baseline Differences by Group Status. A total of 12 tests were conducted to assess differences between intervention and date-and region-matched comparison groups: six chi-square tests on demographic variables, and six *t*-tests on the composite mean for each baseline theory-based construct (Table 8). No significant differences were found on any baseline demographic variables or baseline construct scores between intervention and date-and region-matched comparison participants. There were, however, statistical trends ($.05 < p < .10$) between intervention and date-and region-matched comparison participants on years of experience as well as behavioral beliefs and self-efficacy. There was a trend for the intervention group to have more participants with 4 or more years of experience, and more positive behavioral beliefs and higher self-efficacy.

Attrition Analyses. Though not shown in a table, the same tests were conducted to assess differences between the participants who attended and participants who no-showed

to the training they registered. No significant differences on demographics or baseline construct scores were found between participants who attended and no-showed to trainings. Given that only nine participants were lost at follow-up, further attrition analyses were not conducted.

Table 8

Baseline Descriptives between Intervention and Date- and Region-Matched Comparison Groups (N = 156)

	Intervention (n =69)		Comparison (n = 87)		X^2
	N	%	N	%	
Gender (n=154)					
Female	65	94.2%	79	92.9%	0.10
Male	4	5.8%	6	7.1%	
Race (n=150)					
White	44	66.7%	60	71.4%	0.39
Person of color	22	33.3%	24	28.6%	
Position (n=156)					
Caseworker	51	73.9%	67	77.0%	0.20
Other	18	26.1%	20	23.0%	
Experience (n=156)					
< 4 years	28	40.6%	47	54.0%	2.79
> 4 years	41	59.4%	40	46.0%	
Highest degree (n=154)					
Bachelors or HS	38	55.9%	52	59.8%	0.33
Graduate degree	30	44.1%	34	39.1%	
Discipline (n=153)					
Social work	36	52.1%	41	48.8%	0.17
Other	33	47.8%	43	51.2%	

Baseline Theory-based Constructs	<i>N</i>	<i>M (SD)</i>	<i>N</i>	<i>M (SD)</i>	<i>t</i> -test
Knowledge	69	2.54 (.88)	87	2.54 (.87)	0.05
Beh. Beliefs	69	4.55 (.46)	87	4.02 (.61)	1.69
Self-efficacy	69	4.31 (.56)	87	4.16 (.52)	1.69
Subj. Norms	69	3.59 (.75)	87	3.46 (.74)	1.13
Intentions	45	1.83 (1.24)	53	1.24 (.19)	1.40
Communication	45	0.28 (.31)	48	0.20 (.28)	1.44

Outcome Analyses. Table 9 displays results of each regression on the 3-month follow-up theory-based construct with predictor variables including the baseline measure of the parallel outcome measure and group status. After controlling for respective baseline scores, group status was a significant predictor of change on knowledge, behavioral beliefs, and self-efficacy. Specifically, intervention participants reported mean behavioral belief scores .22 points higher ($p = .003$), mean self-efficacy scores .16 points higher ($p = .022$), and knowledge sum scores .34 points higher ($p = .004$), compared to comparison participants. Intervention status did not have an impact on subjective norms, intentions, or communication. For variance explained in these six regressions (R^2), the baseline measure of the construct and group status explained between 11% of variance for knowledge and up to 38% of variance for communication.

Table 9

Regressions on 3-Month Post Mean Theory-based Construct Scores (N = 147)

Dependent Variable	B	SE	β	p-value	R^2
3m Post Behavioral Beliefs					.226
Baseline Beh Bel	0.36***	0.07	0.41	>.001	
Intervention	0.22**	0.07	0.22	0.003	
3m Post Subj Norms					.314
Baseline Norms	0.55***	0.07	0.56	<.001	
Intervention	0.09	0.1	0.06	0.365	
3m Post Self-efficacy					.373
Baseline Efficacy	0.56***	0.07	0.58	<.001	
Intervention	0.16*	0.07	0.15	0.022	
3m Post Knowledge					.109
Baseline Knowledge	0.26***	0.08	0.27	0.001	
Intervention	0.34**	0.14	0.23	0.004	
3m Post Intent					.282
Baseline Intent	0.57***	0.10	0.55	<.001	
Intervention	-0.21	0.24	-0.08	0.385	
3m Post Communication					.381
Baseline Commun	0.58***	0.08	0.62	<.001	
Intervention	0.04	0.05	0.06	0.501	

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

Chapter Five: Discussion

Child welfare involved youth have less consistent access to traditional pregnancy prevention services. The child welfare system itself, therefore, becomes an important target for intervening with youth in care. As the primary broker of services for YFC, child welfare workers are distinctly well positioned to fill education and service gaps related to sexual and reproductive health (Garwood et al., 2015; Winter et al., 2016). This study provides insights into the knowledge, attitudes, and communication patterns related to sexual and reproductive health communication with YFC among child welfare workers. It is also the first study with a comparison group to examine the preliminary efficacy of a training to enhance child welfare workers' knowledge, attitudes and behaviors in communicating with YFC about sexual and reproductive health.

Baseline Knowledge, Attitudes, and Communication

Overall, baseline rates of knowledge, attitudes and communication regarding sexual health with YFC mirror the limited literature suggesting that caseworkers believe sexual and reproductive health of YFC is important, but their communication practices may not reflect those beliefs (Constantine et al., 2009; Dworsky & Dasgupta, 2014; Pilgrim, 2012). In the current study, child welfare workers reported high behavioral beliefs; specifically, they reported that caseworkers should communicate with YFC about sexual and reproductive health topics at baseline. Child welfare workers also reported relatively high confidence in their ability and comfort to communicate (i.e. self-efficacy)

about sexual and reproductive health topics. These findings of positive behavioral beliefs and high self-efficacy are similar to studies conducted in Kansas and in Illinois. In the Kansas study, child welfare workers reported positive attitudes about the importance of sexual health for YFC, and moderate to high levels of comfort with concepts and issues regarding sexuality (Pilgrim, 2012). It should be noted that the measure of comfort in the Kansas study was quite different from the current study's measure. The Kansas study utilized Attitudes Toward Sexuality Scale (Fisher et al., 2009) to measure comfort, which assesses one's conservatism or permissiveness towards sexuality and sexual matters, whereas the current study's measure focused on workers' comfort in discussing sexual health topics with YFC. Another study in Illinois found that child welfare workers' held strong beliefs about the value of discussing sexual health topics with YFC (Dworsky & Dasgupta, 2014). Though all of these studies, including the current one, used convenience samples and may not be representative of all child welfare workers, such consistency in the findings around behavioral beliefs that YFC need sexual health resources and that this area is an important aspect of child welfare suggests some consistency in these beliefs across the field of child welfare in the U.S.

Though child welfare workers' behavioral beliefs and self-efficacy were high, perceptions of whether their supervisors and colleagues believed that caseworkers should communicate about sexual health with YFC (i.e., subjective norms) were relatively less strong. From the extant literature, even less is known about subjective norms related to this topic, but perceptions that personal beliefs are more positive than perceived norms are consistent with the findings in one qualitative study that suggested that caseworkers

are unclear if sexual and reproductive health is within their scope of work or if there would be support at the administrative level for communicating about such needs or risks (Constantine et al., 2009).

Reports of knowledge of services and policies related to sexual health of YFC indicated that only about one-third of child welfare workers knew that there was no age limit to consenting for contraception and STI testing in Colorado, though most (93.0%) answered correctly that a 17-year old could access contraception confidentially. Given that the average age of first sex for YFC is 15-years-old, and that YFC generally lack trusted adults and access to health education (Connolly, Heifetz, & Bohr, 2012; Love et al., 2005), the policy of no age of consent for contraception and STI testing and services is critical knowledge for YFC as well as for child welfare workers. As per the theory of the Gateway Provider Model, youth almost exclusively access services through the guidance of an adult. If child welfare workers, who are some of the most proximal adults to YFC, do not know about this policy, there is little chance that YFC will know. In regards to both local and online resources for YFC and their caregivers, though most participants were able to list a local resource (84.1%), the resources were often vaguely described and included generic resources such as “health department.” Though these answers counted as “correct,” such vague answers do not clearly indicate whether the participant knew if that resource was truly available to youth in their county, or if that resource was actually an appropriate or the best resource for YFC. Additionally, only about one-third of child welfare workers could name an online educational resource, which may be particularly important for caseworkers in rural areas as access to services is

limited. These data on knowledge of services had not been investigated prior to this study and these are new data for the field.

Frequency of communication. In regards to intentions to communicate in the coming month and past month communication with adolescents on a caseload, child welfare workers reported, on average, that they intended to discuss at least one of the topics (i.e., pregnancy prevention, STIs, healthy relationships, resources or services) with “a few” to “some” of their clients in the coming month, and that they discussed one of the four topics with an average of 24% over the past month. As studies examining communication between caseworkers and YFC about sexual health risks vary greatly in how communication is measured, it is difficult to assess how the current study’s rates compare to the limited literature. A study in Illinois found that an average of 70% of caseworkers *ever* discussed the topics investigated in this study with *any* youth (Dworsky & Dasgupta, 2014). A study in Kansas found that 68% of caseworkers discussed these topics with 10% or less of their caseload over the past two months (Pilgrim, 2012). A study out of California found that 23% to 34% of caseworkers said that they “often talk with youth” about sexual health topics. This variety in measuring communication makes comparisons across studies difficult, though they generally seem to suggest a potential mismatch in beliefs and behaviors, given how positive behavioral beliefs tend to be. This mismatch could be due to barriers such as the sensitivity and controversial nature of sexual health topics, that knowledge of resources and supports for youth are not widely known, and that administrative support for addressing such concerns is opaque. Such

barriers may inhibit communication regarding sexual health despite believing that they are needed by YFC.

The consistent findings regarding caseworkers' strong beliefs about sexual and reproductive health needs of YFC may suggest that sexual health issues or concerns arise frequently; otherwise, beliefs would not be so strong. Further, in this study the disparity between attitudes and intentions may be related to the specific timeframe given for questions on intentions and communication (i.e., current/past month), versus an overall assessment of their capability and comfort in communicating. While this study's rates of communication add greater specificity to the literature, and indicate that at least some caseworkers discuss these issues with a proportion of their caseloads, what these numbers do not indicate is whether sexual and reproductive health topics arise consistently or for most caseworkers. It may be that they only arise with certain youth or workers. Similarly, these data do not lend insight into the quality of the communication or whether such communication is effective or helpful to YFC.

Homogeneity of Child Welfare Workers' Beliefs & Communication. This study found no significant differences in knowledge, attitudes, or communication by any worker demographic variable (i.e., gender, race, years of experience, highest degree, degree type, and position). Though this sample was largely White (71%) and female (94%), which may have limited the power to detect differences on these demographic factors, the racial breakdown of the sample reflects Colorado demographics at large. The US Census Bureau reported that 68.3% of Coloradans identified as White only, 21.5% as

Latino or Hispanic, and 4.5% as Black (US Census Bureau, 2018). Additionally, the child welfare workforce is primarily female.

Only the Kansas study examined differences in child welfare workers' attitudes and communication by demographics (Pilgrim, 2012). The study found no demographic differences (i.e., age, gender, race/ethnicity, religion, education, and type of degree) with the exception of comfort towards issues and concepts of sexuality (which as previously described is a different measure and conceptualization of comfort compared to this study's construct of self-efficacy that involve comfort towards discussing specific sexual health topics with YFC). In regards to comfort with sexuality in Kansas, White participants reported greater comfort, or rather permissiveness regarding sexual matters, than participants of color (Pilgrim, 2012). Overall, these findings suggest that, at least within a single state, child welfare workers have similar beliefs and behaviors in regards to communicating with YFC about sexual health and that demographic, employment characteristics, and education have little influence.

Though no differences on knowledge, attitudes or communication regarding sexual health were found by worker demographics, participants were more comfortable discussing sexual health topics with youth of their same gender. Thus, while the workers' demographics alone may not impact their attitudes and behaviors, how a worker's demographics differ from the youth's demographics likely does. This result supports previous findings in qualitative research suggesting that child welfare workers are less likely to communicate about sexual health with youth of different genders than themselves (Constantine et al., 2009).

Interrelationships of Theory-based Constructs: Which Matter Most?

Understanding how baseline constructs are related and which constructs are most important for predicting the desired outcome carries critical implications. These questions lend insight into what matters most when designing and implementing interventions and which areas to target. Answering the question of what mediates an outcome, or through what mechanism an intervention works, is a critical question to advance any field of intervention research. Using a path analysis allows one to more carefully and fully answer this question as it allows for modeling of all of the associations, and for mediating pathways simultaneously.

Overall the Theory of Planned Behavior (TPB) with additional components from the Gateway Provider Model proved to be an efficient model for predicting caseworkers' intentions to communicate and actual communication regarding sexual and reproductive health. The path analysis model diagram (Figure 5) accounted for 22.8% of variance in intentions and 26.5% of variance in communication. Though this is substantial, roughly three-quarters of variance is explained by other factors not observed in this study. In studies on parent-child communication related to sexual risk, quality of relationship is a key predictor of communication. It may be that characteristics specific to each worker-youth relationship, such as therapeutic alliance and gender match, account for the unexplained variance. Ultimately, in the current study subjective norms and self-efficacy were the only constructs that had significant direct effects on intentions, and intentions was the only construct that had significant direct effects on communication. Knowledge, however, also showed a statistical trend of a direct effect on communication (this

relationship was not at the .05 alpha level). Further, through examining indirect effects, we can conclude that intentions to communicate mediated the effect of self-efficacy on communication at baseline. It is important to emphasize that this path analysis was conducted with cross-sectional data, and thus cannot determine temporal order.

The importance of self-efficacy. In the TPB, self-efficacy is described as particularly important, as intentions can only be expected to realize into behavior if the individual possesses control over the behavior. According to Ajzen, behavior is a joint function of self-efficacy and intentions (Ajzen, 1991). While both can make significant contributions to the prediction of behavior, in any given application, one may be more important than the other and only one of the two may be needed to produce behavioral results. Indeed, in a 2006 meta-analysis of the link between intentions and behaviors, researchers found that self-efficacy acted as a moderator of intentions and behavior, such that when self-efficacy was high intentions had a larger effect on behaviors (Webb & Sheeran, 2006).

In addition to Ajzen's hypothesized relationship of self-efficacy with intentions and communication, the path model results suggest that self-efficacy is a particularly important theory-based construct for intentions and communication in this application of the TPB. Self-efficacy in this study involved not only an assessment of how capable one may be, but also how comfortable one is discussing sexual health topics with YFC. Self-efficacy has long been documented as an important factor for transference of competencies learned in trainings to actual performance of that behavior (Blume, Ford, Baldwin, & Huang, 2010; Grossman & Salas, 2011). Research on the transference of

learned competencies into actual behaviors shows that learners who have more confidence in their ability are more likely to persist in carrying out a difficult task and that learners must believe in their ability to perform skills before they can be realized (Blume et al., 2010; Grossman & Salas, 2011).

The findings on self-efficacy in this study resonate with training research, as well as with research on sexual health communication that also finds components of self-efficacy to be particularly important for communication. In a study examining how the TPB explained parent-child communication about sexual risks, self-efficacy was the only construct that had significant direct effects on mother's intentions to communicate. In Cederbaum et al.'s (2013) study, self-efficacy also had direct effects on communication, along with behavioral beliefs and intentions (Cederbaum et al., 2013). Further, in a meta-analysis on parent-child sexual risk communication interventions, increasing comfort around such topics was linked to increased communication (Santa Maria et al., 2015).

All of this points to the importance of increasing child welfare workers' belief in their ability and comfort around communicating with YFC about sexual health. This may be counter-intuitive given that in the current study self-efficacy was generally high at baseline. However, it is possible that self-efficacy at baseline is inflated due to social desirability and a significant proportion of caseworkers having little actual experience of communicating with YFC about sexual health. Ajzen proposes that self-reported measures of self-efficacy may be less realistic if an individual has little experience with the behavior or if resources related to the behavior are unfamiliar or have changed (Ajzen, 1991). Given that caseworkers' communication about sexual health may likely be

consolidated within a proportion of participants, estimates of self-efficacy may be inflated. Ultimately, despite already having positive beliefs of self-efficacy at baseline, this analysis as well as past research supports the idea that interventions seeking to promote sexual health communication among caseworkers should focus on components of self-efficacy, which should explicitly aim to increase child welfare workers' skills to communicate as well as their comfort.

The importance of subjective norms. Subjective norms also played a key role in this model, as it was the only other theory-based construct (in addition to self-efficacy) with significant direct effect on intentions. In Cederbaum et al.'s 2013 study, authors explained that normative beliefs related to parent-child communication about sexual health identified the value of cultivating environments where it is normative to talk to youth about sexual health. In regards to a workplace, it seems that subjective norms could play an even larger role than they do with parents and their children, as workers are there as professionals doing a job on behalf of the agency. In a 2006 meta-analysis of 47 studies examining the relationship between intentions and behaviors, Webb & Sheeran found that in situations where the behavior had the potential for social reaction, the impact of intentions on behavior was reduced. Given that the topic of youth sexual health is controversial and that the application is within the context of a work place, it is likely that communicating about sexual health with YFC has the potential (or at least the perception) of social reaction. This points to the importance of subjective norms in this model, and the need for child welfare leadership to send clearer messages about how an

agency views the topic of sexual health of YFC as well as guidance and resources on how to address such issues.

Protocols and policies are an obvious way to send clearer messages and to influence norms. Title 19, referred to as the “Colorado’s Children Code,” creates the structure and dictates the protocols and responsibilities of the child welfare system in Colorado. In Title 19, no language acknowledges or outlines sexual or reproductive health needs of youth in county care and the terms “sexual health,” “reproductive health” and “reproductive,” do not exist in this document. Child welfare policy shapes the context of caseworkers’ environment and establishes norms and expectations that influence subjective norms, as well as each of the constructs within the TPB and Gateway Provider models. In the literature, a lack of policy and protocols to address sexual and reproductive health is noted as a barrier to caseworker engagement regarding sexual health of YFC (Constantine et al., 2009; Dworsky & DeCoursey, 2009; Svoboda et al., 2012). Complicating this void in policy and protocols, child welfare workers often face challenges of inadequate resources, high caseloads, and time constraints (Lipsky, 1980). Given the constraints, as well as the sensitivity and often controversial nature of discussing youth sexuality, it is understandable that these topics are addressed inconsistently. However, language in policy and protocols could clarify that sexual and reproductive health of YFC is a priority, and shift child welfare community norms. Such a shift could allow intentions to realize into behaviors more easily.

Knowledge of services and policies. Other than intentions to communicate, the only other significant direct effect on communication regarding sexual health topics was,

knowledge of services, though this was only a statistical trend. The only other construct that knowledge of services was associated with was self-efficacy. It is possible that knowledge of services specifically contributes to self-efficacy and communication, and that having greater knowledge of services increases one's perception of themselves as capable of and comfortable with discussing such topics. At least theoretically, knowledge of relevant policies and resources to refer youth would either impact one's self-efficacy or the effectiveness of the communication itself. As brokers and facilitators of information and resources, actual knowledge of resources for sexual health is critical for effective communication, and for that communication to translate to increased access and utilization of resources for YFC. As this was the first study to examine workers' knowledge of services related to sexual and reproductive health, future research replicating this construct and its relationship with other constructs is critical.

Intervention Impacts

Intervention analyses showed that three months after their respective trainings, participants in the sexual health training had more positive behavioral beliefs regarding the importance and need for workers to communicate about sexual and reproductive health, greater knowledge of services for sexual and reproductive health, and higher self-efficacy to communicate about sexual and reproductive health compared to date- and region-matched comparison participants. Differences between the intervention and date- and region-matched comparison groups were not observed on subjective norms, intentions, or communication. Though the intervention and comparison groups were comparable on observed variables, self-selection into the study and the intervention group

is a limitation of these findings, and it is also possible that other explanations related to unobserved group differences may account for improved outcomes. Nevertheless, despite the lack of observed intervention effects on intentions to communicate and past month communication about sexual and reproductive health, it is promising that a 6.5 hour training had impacts on behavioral beliefs, knowledge, and self-efficacy, which are constructs often considered prerequisites for behavior change.

These findings are consistent with similar pilot studies. For example, the Gateway Provider Model was used to develop an intervention (i.e., Project Focus) to increase caseworkers' referral of YFC to evidence-based mental health services (Dorsey et al., 2012; Fitzgerald et al., 2014). Project Focus provided a 9-hour in-person caseworker training over two days, as well as eight hours of case-based consultation for over 16 weeks; thus, Project Focus provided significantly more support than the current study's 6.5-hour training intervention. While significant intervention effects were found on knowledge of evidence-based programs, and greater ability to classify mental health problems and match them to evidence-based programs, effects were not found on their main behavior change outcome, namely referrals to evidence-based programs (Fitzgerald et al., 2014).

Lack of significant findings on intentions to communicate and actual communication with YFC regarding sexual health in the current study could be explained in several ways. First, while potential improvements in behavioral beliefs, self-efficacy and knowledge are exciting, in order to produce effects on intentions and communication, changes in subjective norms may be necessary. Given that the application of this model is

within a professional setting where separation of personal values and beliefs should occur, and on a topic that is controversial in nature, clearer agency messages and guidance around communicating with YFC about sexual health may be needed before intentions to communicate can be realized.

In the intervention Project Focus, a key question was whether increased knowledge of evidence-based mental health services would yield more referrals to evidence-based mental health interventions (Dorsey et al., 20214; Fitzgerald et al., 2014). While trials of Project Focus showed increased knowledge, it did not show increased referrals. Authors proposed that an intervention with an organizational component or supervisor involvement may be needed for intervention impacts on the primary outcome (Dorsey et al., 20214; Fitzgerald et al., 2014). Interventions at the caseworker level targeting the facilitator or broker of services, like Project Focus and this study, are rare. Focusing on the facilitator of services offers a promising opportunity for increasing the ability to link youth with effective services and education. Particularly in resource- and time-constrained settings like child welfare in which workers are balancing many competing concerns organizational and supervisor support may be essential. This may be even truer for topics, such as sexual and reproductive health, that have potential for social reaction.

Another potential explanation for lack of effects on intentions and communication is that the sample size in this study was relatively limited for participants who carried an adolescent caseload. The sample size dropped more than 40% between those who could answer questions on attitudes and knowledge and those who carried an adolescent

caseload and could also answer items about intentions and communication at both baseline and the 3-month follow-up. For example, for intervention analyses on communication, only 79 participants, roughly half of the full 3-month follow up sample, carried an adolescent caseload at both baseline and the 3-month follow-up. This limited the power to detect a small to moderate effect on intentions and communication, unlike other measures that did not require current or past month caseloads. Also, the average number of adolescents on a caseload was rather small with large standard deviations. At baseline, the average size of an adolescent caseload was 7.1, with a standard deviation of 8.4; the median was only 4. Thus, changes in the percentage of one's caseload that a caseworker communicated with in the past month could incur large swings with just one or two participants (up or down) that may not be practically significant.

Despite the lack of impact on subjective norms, intentions to communicate, and actual past month communication, it is important to recognize that the intervention impacted child welfare workers' self-efficacy to communicate. According to Ajzen's hypothesized model and empirical evidence for the TPB, self-efficacy is a particularly important construct for behavioral outcomes. Consistent with this, in the path analysis of baseline theory-based constructs, self-efficacy had a direct effect on intentions and an indirect effect on communication. Significant intervention effects on self-efficacy suggest that trainings in general, and this sexual health training in particular, can impact participants' sense of comfort and capability in discussing these topics. Given that baseline self-efficacy was high, it is especially impressive that self-efficacy was significantly improved.

Knowledge, another construct identified as important for communication from baseline path models, was also significantly improved by the intervention. Knowledge of services and policies may contribute to self-efficacy and communication in a unique way, as it demonstrates that one has specific and critical information that is easily passed along to YFC or their caregivers. Though quality or content of communication was not captured in this study, knowledge of services and policies may be a key to improving the quality of communication such that it goes on to increase YFC's access to resources and services.

Though behavioral beliefs did not have direct effects intentions or communication at baseline, they were significantly associated with self-efficacy and subjective norms, and are not inconsequential to the model or outcomes. Similar to self-efficacy, behavioral beliefs were high at baseline and had the possibility of a ceiling effect, in which participants beliefs had little room to increase. In studies of parent-child sexual risk communication, more positive behavioral beliefs about communicating did have direct effects of increased communication (Cederbaum et al., 2013; Hutchinson et al., 2003). Though these relationships between behavioral beliefs and communication were not found in the baseline path analysis of the current study, evidence from other similar studies suggests the potential importance of these beliefs related to adults communicating with youth about sexual health.

Limitations

Despite the many strengths of this study including a comparison group, low attrition rate, and thorough measures, there are several limitations related to both internal and external validity. In particular, self-selection bias is of concern. Both the intervention

and comparison groups were convenience samples, and the overall participation rate was 50%. Because caseworkers self-selected into the trainings, those who comprised the intervention group may have differed from those in the comparison group on any number of unobserved factors related to communication, beyond just demographic and employment variables. It is likely that those attending the sexual health training were more interested in sexual and reproductive health and more motivated to take action in this area than those who did not select to attend this training. Further, learners in any training who were also willing to participate in this study may differ from those who declined participation. Since data on non-responders were not available, it was unclear the extent of the selection bias. This limits the generalizability of the findings as this sample is not necessarily representative of all child welfare workers, even in Colorado. Additionally, this sample was predominantly female and White. While this is reflective of child welfare worker demographics, the number of participants who identified as male or a person of color, may have simply been too small to detect differences by these demographics.

Another area of bias, is that the PI of the study was also the developer and facilitator of the sexual health training. Researchers playing multiple roles and not being masked to the condition can introduce bias. In this case it also presented an additional opportunity for social desirability as intervention participants knew the researcher of the study at the 3-month follow-up. Several steps were taken to address this concern. First, recruitment and participation in the study occurred prior to the training and was completely electronic. The author did not record any responses, handle paper versions of

participants' responses, or view any responses prior to trainings. These steps removed the investigator and facilitator from direct administration of the surveys, and provided distance between the investigator/facilitator and the participants.

Though this study was relatively large for a pilot study, the sample size was small for conducting the path analysis model. The smaller sample of participants who had a current or past month adolescent caseload at baseline ($n = 129$) may have lowered power to detect significant associations. The same limitation may also be true for the intervention analyses on intentions and communication, as the sample of participants with an adolescent caseload was only about half of the full 3-month follow-up sample. Additionally, running multiple statistical tests to assess associations with the intervention (in this case, six linear regressions) increases the random chance of finding a false significant association. In future research, Bonferroni corrections should be considered, or increasing the sample size to allow for testing the intervention associations on the model as a whole through path analysis.

Measures used in this study were all developed and adapted from existing studies and measures, and were robust with multiple items and strong reliability. However, in the versions that were used in this study, none of the items had been used previously nor were any standardized or validated. In particular, the knowledge scale was project-designed and it proved difficult to classify "correct" answers to knowledge of local and online resources, as many participants reported vague or generic responses. Thus, knowledge scores may have been inflated. Though the limitation of this measure is a shortcoming of the study, this knowledge measure does serve as a crude measurement of

knowledge of services and provides a springboard for refinement of this construct.

Additionally, all measures were self-reported which is prone to social desirability, as well as recall bias. The one-month timeframe on communication items was intended to ameliorate recall bias, as previous studies asked for communication over one's career in child welfare or past two months.

It is important to note that while the training intervention and model for predicting communication seems promising, there may be various extant factors that have larger impacts on communication between child welfare workers and YFC. In evidence from parent-child communication, we know that the quality of relationship as well a number of other factors impact whether that communication has an impact on adolescent behaviors. The most salient quality related to parent-child sexual risk communication among a study of mother–daughter dyads was relationship satisfaction (Cederbaum et al., 2013). Such unobserved variables, like therapeutic alliance and quality of the communication, may have a strong impact for child welfare workers and YFC, particularly since a caseworker does not have as proximal of a relationship as a parent.

Finally, this study combined various steps that traditionally would be broken into separate processes or studies. Ideally, Aims 1 and 2 would be conducted first, and results would have been used to develop the intervention. Given the need from the CWTS for a training on this topic and the opportunity for community-engaged intervention research, all three aims were pursued in the same study. Despite multiple steps conducted at once, this process still provides valuable data and evidence for each of the research aims and the field.

Policy and Practice Implications

Several clear policy and practice implications emerged from this study. First, the study found that sexual and reproductive health of YFC or children involved in the child welfare system is an already pressing and concerning topic for child welfare workers. Advocating for training and awareness on this topic can suggest that this is an issue that caseworkers are not aware of, or that it needs to be added to their list of concerns to address. However, it is clear from strong beliefs about the importance of these topics, beliefs about the risks YFC face, as well as the regularity of sexual health topics arising that sexual and reproductive health issues are already on the radar of child welfare workers. Providing training, resources, and support on these topics is not necessarily adding something new, though helping workers deal with concerns and issues that they already encounter is novel. My experience as the facilitator of this sexual health training reflected that these topics were not new for caseworkers, and that they already encountered these topics and concerns regularly, though they had few resources and training on how to handle them. Child welfare workers are under great demands and the list of things they are told they should be addressing is always growing. However, sexual and reproductive health is a topic that is already on their radar, yet the institutional support to address such issues is unclear and few resources on how to navigate these issues are known.

Second, behavior change may not be realized without institutional or administration support. In the baseline path model, subjective norms had the strongest predictive relationship on intentions, indicating the importance of child welfare

community norms on this topic. Institutional or administrative support could come in the form of interventions specifically targeting supervisors or in changes to policy. As discussed previously, policy and protocols are clear ways to directly influence norms. In the “Colorado’s Children Code,” (i.e., Title 19) no language acknowledges or outlines sexual or reproductive health needs of youth in county care, and the lack of policy to address sexual and reproductive health has been noted as a barrier to caseworker engagement regarding sexual health of YFC (Constantine et al., 2009; Dworsky & DeCoursey, 2009; Svoboda et al., 2012). Given that child welfare policy shapes the context of caseworkers’ environment and establishes norms and expectations that influence each of the constructs within the TPB and Gateway Provider models, language in policy and protocols could clarify that sexual and reproductive health of YFC is a priority for the agency, and likely shift subjective norms.

Third, training child welfare workers to understand sexual health risks of YFC, to increase awareness of resources, and to cultivate comfort in communicating about these topics is a promising avenue for child welfare systems to address these issues and to support workers and YFC. Further, regular trainings on this topic have the potential to positively impact subjective norms and indicate institutional support. This type of intervention (i.e., trainings) can also be easily and cost-effectively integrated as a part of current child welfare practice. Like Colorado, most states require that child welfare workers complete a certain amount of ongoing training hours to maintain their competencies. Trainings, particularly within a system in which they are already mandated

carry efficiency of scale and can be cost-effective as there are already systems in place for ongoing training.

In regards to the content of such trainings, according to findings from the path analysis in this study, the TPB, and training transference literature, self-efficacy should be a focus through an emphasis on skill-building, increasing comfort, and tools that make discussions easier. Providing learners with tools that facilitate conversations and resources for referrals and education are crucial. While this sexual health training increased self-efficacy of child welfare workers, further refinement is essential for future studies. Specific techniques that could improve the training are the addition of modeling effective communication through videos or instructor demonstration, as these techniques are known to target self-efficacy and can improve the quality of communication. Additionally, specific guidance on strategies for addressing sexual health needs and concerns when a youth is of a different gender than the caseworker seem like important gaps in the training. In the context of different genders between worker and youth, or in cases where self-efficacy is low, it may be particularly important to encourage child welfare workers to utilize the network of medical providers and required medical appointments for YFC to facilitate sexual health conversations with another trusted adult so that the burden does not fall fully on them. Specific resources, like pre-written text messages that caseworkers can use to remind a youth that sexual health is a normal and confidential topic to discuss with a doctor may facilitate important conversation with little extra burden on the child welfare worker. Additionally, booster trainings, or

individual consultation could be beneficial additions to the current training, though these would incur increased cost and be less feasible.

Finally, further research in this area is needed to advance the field. Given that very little research exists on the topic of caseworkers' communication about sexual and reproductive health with YFC, the research needs are vast. Areas for priority are replication studies to confirm which factors are most important for predicting and realizing behavior change, as well as studies that reduce selection bias. While a randomized control trial (RCT) at a state level may not be feasible, a cluster RCT at a county level is likely more feasible and could address the various forms of bias in this study. A cluster RCT could involve recruiting counties which would mandate workers to participate in the sexual health training, and then randomly assigning the counties to receive the training or not (though the control group could be considered "wait-listed" and receive the sexual health training in the future). Such a design would decrease selection bias by including all workers in a county (rather than just participants who may be particularly motivated and interested in the topic), and it would also allow for testing effects of subjective norms when an entire county is exposed to a sexual health training with supervisors and directors involved. Further, this type of study conducted by a PI who is not also the developer and facilitator of the curriculum would help reduce bias.

Other pertinent next steps for research include studies with larger samples that can better investigate subgroups and understand if observed results are generalizable to diverse child welfare workers, and investigation of measures and constructs used to create measures so that scales can be used across studies for comparison of findings.

Additionally, research on the consistency, content, and quality of communication with YFC, as well as reasons why caseworkers may or may not communicate with various youth would reveal important insights to this topic. Finally, the ultimate goal of this research is to increase the agency, autonomy, and access of YFC to make sexual and reproductive health decisions that improve their lives; future studies should therefore go beyond testing whether training increases workers' behavior, but also whether this improves sexual and reproductive health outcomes for youth in foster care.

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