

**AN EXAMINATION OF THE NECESSITY AND FEASIBILITY OF
WEB-BASED TREATMENTS FOR POSTPARTUM ANXIETY**

Miriam T. Ashford

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Centre for Maternal and Child Health Research

School of Health Sciences

City, University of London

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ABBREVIATIONS

BAI Beck Anxiety Inventory	OCD Obsessive–compulsive disorder
BC Both conditions	PA Panic disorder
BDI Beck Depression Inventory	PHQ-9 Patient Health Questionnaire (Depression)
BSI Brief Symptom Scale	PRIMSA Preferred Reporting Items for Systematic Reviews and Meta-Analyses
CBT Cognitive-behavioural therapy	PTSD Post-traumatic stress disorder
CSQ-8 Client Satisfaction Questionnaire	PSS Perceived Stress Scale
DASS Depression Anxiety Stress Scale	RCT Randomised controlled trial
DSM-5 Diagnostic and Statistical Manual of Mental Disorders 5	SCID Structured Clinical Interview for DSM Disorders
EPDS Edinburgh Postnatal Depression Scale	SF-36 Short Form (36) Health Survey
GAD Generalised anxiety disorder	STAI State Trait Anxiety Inventory
GAD-2/7 Generalized Anxiety Disorder Scale	SUS System Usability Scale
GP General practitioners	UK United-Kingdom
HADS Hospital Anxiety and Depression Scales	WaWa What Am I Worried About
HRSD Hamilton Rating Scale for Depression	
HV Health visitor	
IAPT Improving Access to Psychological Therapies Services	
IBI Internet-based intervention	
IC Intervention condition	
ICG Inventory of Complicated Grief	
IES Impact Event Scale	
IPT Interpersonal therapy	
iWaWa Internet-based What Am I Worried About	
MSPSS Multidimensional Scale of Perceived Social Support	
NICE National Institute for Health and Care Excellence	
NHS National Health Services	
NSPSS National Society for Prevention of Cruelty to Children	

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DECLARATION

This thesis is by prospective publication. The first chapter presents an overview of the current literature regarding postpartum anxiety and Internet interventions, as well as the models which guided the development of a web-based version of the What Am I Worried About (WaWa) program and its evaluation in England. Chapters 2-7 of this thesis are distinct articles published in or submitted to peer-reviewed journals. The concluding Chapter 8 presents a discussion of the results from the preceding chapters. The references for all chapters can be found at the end of the thesis.

All of the articles included in the Chapter 2-7 in this thesis are presented here as the final published or submitted manuscripts. The articles are my own work with guiding involvement from my supervisors Professor Susan Ayers and Dr Ellinor Olander. For two articles (Chapter 5 & 7) the developers of the What Am I Worried About Program, Heather Rowe and Jane Fisher, provided guidance. For all articles, I wrote the first draft and took the lead on all subsequent revisions including those as part of the peer-review process. Full references and a detailed description of the contribution as follows:

Chapter 2 is published in the *Journal of Affective Disorders* as:

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I hereby declare that this thesis has not been, and will not be, submitted in whole or in part to another University for the award of any other degree.



Miriam Ashford

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**AN EXAMINATION OF THE NECESSITY AND FEASIBILITY OF
WEB-BASED TREATMENTS FOR POSTPARTUM ANXIETY**

ABSTRACT

Background: Postpartum anxiety is common and can adversely affect the woman, child, family and society if untreated. Despite available effective treatments, practical constraints and stigma keep many women from seeking help or accessing treatments. Self-guided web-based treatments offer convenient and anonymous access and have been shown to be effective and acceptable for anxiety in the general population.

Aims: This thesis by prospective publication aimed to examine the need for and interest in web-based postpartum anxiety treatments, as well as to develop a web-based version of the existing What Am I Worried About (WaWa) program for postpartum generalised anxiety disorder and evaluate the feasibility of the web-based version (iWaWa) in England.

Methods & Results: The thesis aims were addressed using a multi-method approach. Chapter 1 reviews the literature of postpartum anxiety and Internet treatments, as well describes WaWa's origin and the models guiding iWaWa's development and evaluation. In Chapter 2 a systematic review of computer- or web-based treatments ($n = 11$ studies) found that such treatments may be effective for postpartum depression and complicated grief, but no treatment was found for postpartum anxiety specifically. In Chapter 3 a web scoping review found a diversity of web-based anxiety programs ($n = 34$) and identified a variety of online treatment formats. Chapter 4 and 5 stem from one interview study with 13 health visitors. Chapter 4 reports on the need for treatments targeted at postpartum anxiety. Chapter 5 highlights the opportunities and challenges to consider before implementing web-based anxiety treatments in the postpartum care. In Chapter 6 an online survey of 114 postpartum women revealed that social media is a feasible way of reaching of postpartum women with anxiety in England and the majority of participants (61%) expressed interest in web-based anxiety treatments in an accessible smartphone/tablet format and short modules. Chapter 7 presents a randomised controlled trial testing iWaWa's feasibility and acceptability. The findings showed that despite interest in iWaWa, both the study and iWaWa were not feasible in the current format. The trial also identified evidence about web-based treatment format and content preferences of women with postpartum anxiety.

Discussion: Chapter 8 synthesises and discusses the previous results. Overall, the findings from this PhD suggests a current need and interest in web-based treatments for anxiety in the literature, as well as among postpartum women and health care professionals. However, obstacles in the treatment uptake and adherence were discovered in the current format of iWaWa. Identified treatment format and content preferences can inform future development of iWaWa, as well as web-based postpartum anxiety treatments in general to optimise adherence.

CHAPTER 1 – BACKGROUND

Introduction

This background chapter provides an overview of the current literature and research related to postpartum anxiety web-based interventions, an introduction to the treatment investigated in this thesis, as well as an outline of the thesis's aims. More specifically, the first section provides an overview of the postpartum period including postpartum adjustment and postpartum mental health in general, as well as perinatal mental health in the United Kingdom (UK). The second section presents and discusses postpartum anxiety disorders including types, prevalence, risk factors, impact, identification and treatment, as well as postpartum help-seeking and treatment barriers. The third section addresses the use of the Internet for treatment including access to the Internet, online health information seeking, as well as types, benefits, limitations, efficacy and acceptability of Internet treatments in general and specifically for postpartum mental health issues. The fourth section introduces the What Am I Worried About (WaWa) treatment, a self-help treatment for women with postpartum anxiety. The section presents WaWa's origin, as well as the models guiding the adaptation and evaluation models of an Internet-based version of WaWa, called iWaWa. The fifth section briefly summarizes the literature and outlines the aims and research questions of this thesis.

The Postpartum Period

Postpartum Adjustment

Entering motherhood is a time of tremendous social, emotional and biological changes in a woman's life, which are often physically and emotionally challenging. Giving birth to a baby starts a period of social transitions for a woman, with transitions occurring in work, recreational, family and friend life, roles and relationships. It takes time to adjust to the new life, renegotiate relationships and roles and incorporate a new sense of self as a mother (Barclay, Everitt, Rogan, Schmied, & Wyllie, 1997). Although the transition and adaptation to motherhood is often considered by our society to be a normative positive experience, it can also be experienced as disruptive and overwhelming. A meta-synthesis of qualitative studies suggests the following five areas of disruption can be experienced by mothers in the postpartum period: commitment (e.g. accepting responsibilities, feeling the maternal-child bond); daily life (e.g. learning mothering); relationships (e.g. adapting to changed relationship with partner, family, and friends); self (e.g. facing oneself and the past, coming to feel like a mother)

and work (e.g. decision making regarding return to work, dealing with conflict, search for balance) (Nelson, 2003).

In addition to social changes, entering motherhood is also a time of immense biological and psychological changes, as well as heightened emotional sensitivity for many mothers (Barnes, 2014; Gavin et al., 2005; Redshaw & Martin, 2011). Biological changes include bodily and hormonal changes (Hendrick, Altshuler, & Suri, 1998). Changes in mood, including both intense negative and positive emotions are common in the postpartum period and likely to vary in intensity, over time and by individual (Fleming, Ruble, Flett, & Van Wagner, 1990; Najman, Andersen, Bor, O'Callaghan, & Williams, 2010).

Postpartum Mental Health

Despite the above mentioned changes and new responsibilities, for the majority of women motherhood is a predominately positive experience (DiPietro, Goldshore, Kivlighan, Pater, & Costigan, 2015; Green & Kafetsios, 1997). However, childbirth and the adjustment to parenthood can be emotionally challenging and stressful and therefore it is common and normal for new mothers to experience mood changes temporarily as a result of these stressors and adjustments (Dennis, Falah-Hassani & Shiri, 2017). For example, in the first week or so after birth it is common for women to be feeling 'mentally tense', 'overemotional', 'oversensitive', 'low spirited', 'tearful', and 'irritable' which is often referred to as postpartum blues or baby blues (Buttner, O'Hara, & Watson, 2012). The common, so-called 'baby blues', is a brief period with symptoms of low mood, anxiety and tearfulness which peak on the fifth day postpartum (Stein, 1980). However, a subset of postpartum women develop mental illnesses (Brockington, 2004; O'Hara & Wisner, 2014) ranging from mild to severe affective disorders, such as anxiety and depressive disorders, to more severe illnesses such as psychosis, bipolar disorder, and post-traumatic stress disorder (PTSD) (Howard, Molyneaux, et al., 2014; Jones, Chandra, Dazzan, & Howard, 2014). For postpartum depression prevalence rates range between 10–15% (Darcy et al., 2011; Gavin et al., 2005; Vesga-López et al., 2008), 3.7-20% for postpartum anxiety disorders (Dennis et al., 2017; Goodman, Watson, & Stubbs, 2016; Leach, Poyser, & Fairweather-Schmidt, 2015) and 3-4% for PTSD after childbirth (Grekin & O'Hara, 2014; Yildiz, Ayers, & Phillips, 2017). The incidence of first-lifetime onset postpartum psychosis/mania varies from 0.25 to 0.6 per 1,000 births (Bergink, Rasgon, & Wisner, 2016).

Taken together, a considerable number of women experience postpartum mental health issues and one of the most common postpartum mental health issues is anxiety. Postpartum anxiety is the focus of this thesis which will be discussed in greater detail in the next section.

Postpartum Anxiety

Anxiety may be experienced as distress, uncontrollable worries, panic, avoidance or obsessive thoughts (American Psychiatric Association, 2013). Anxieties in the postpartum period are often life-stage specific, for example worries about baby's care and health and fear of criticism and inadequacy as a mother (Rowe, Calcagni, Galgut, Michelmore, & Fisher, 2014). Similarly, qualitative studies show anxieties around maternal competence, attachment, baby care, safety and welfare, as well as psychosocial adjustment to motherhood (Brockington, Macdonald, & Wainscott, 2006; Fallon, Halford, Bennett, & Harrold, 2016; Highet, Stevenson, Purtell, & Coe, 2014; Phillips, Sharpe, Matthey, & Charles, 2009). Most women who experience anxiety postpartum do not need pharmacological or non-pharmacological treatment (Dennis, Coghlan, & Vigod, 2013; Matthey & Ross-Hamid, 2012). For some postpartum women the severity of anxiety symptoms may not meet a clinical diagnosis of an anxiety disorder, but the symptoms may still cause them distress and impairment for which they might want help (O'Hara & Wisner, 2014). Unfortunately, for some women anxiety can become persistent and symptoms rise to the level of a clinical anxiety disorder diagnosis.

Postpartum anxiety disorders can either be a reoccurrence of a previous disorder or develop as a first episode. Symptom intensity and associated degree of impairment of these anxiety disorders can vary over the course of the postpartum period (O'Hara & Wisner, 2014). It has also been suggested that anxiety increases in the first months postpartum or that anxiety symptoms may not manifest until later in the postpartum period (Breitkopf et al., 2006; Britton, 2008). On the contrary, a recent systematic review and meta-analysis shows that postpartum anxiety prevalence decreases from approximately 18% at 1–4 weeks postpartum to 15% at 5–12 weeks postpartum (Dennis et al., 2017).

Types of Postpartum Anxiety

A wide range of anxiety disorders are prevalent in the postpartum period, including generalised anxiety disorder (GAD), obsessive–compulsive disorder (OCD),

panic disorder (PD), as well as phobias (social phobia, agoraphobia and specific phobias) (Goodman et al., 2016; O'Hara & Wisner, 2014). This section includes a brief definition of OCD, PD and phobias and a more detailed description of GAD as it is the focus of this thesis.

OCD is a chronic disorder in which a person has uncontrollable and reoccurring thoughts, and behaviours which the person experiences or performs repeatedly (American Psychiatric Association, 2013). PD is characterized by recurrent and unexpected brief episodes of intense fear shown by physical (e.g. shortness of breath, sweating, etc.) and cognitive symptoms (e.g. feeling something bad is about to happen) (American Psychiatric Association, 2013). Phobias are defined by a persistent fear of specific objects or situations. Feared objects or situations are avoided and if encountered result in a rapid onset of fear and distress (American Psychiatric Association, 2013).

Generalised anxiety disorder. Individuals with GAD experience excessive anxiety and worry (American Psychiatric Association, 2013). Symptoms of GAD include, recurrent, time-consuming, intrusive, irrational and uncontrollable worry, as well as physical symptoms such as fatigue, irritability, tension, concentration difficulties and insomnia, which can cause the individual functional impairment (Misri, Abizadeh, Sanders, & Swift, 2015). In order to be diagnosed with GAD the current Diagnostic and Statistical Manual of Mental Disorders (DSM-5) states six criteria which an individual has to meet (American Psychiatric Association, 2013). Table 1.1 on page 28 presents the diagnostic criteria outlined by the DSM-5 (American Psychiatric Association, 2013).

General themes of peripartum worries include fears of infant illness, maternal illness, illness in the partner, and parental mortality (Misri et al., 2015). For depression, the DSM-5 specifies to diagnose a major depressive disorder with postpartum onset if symptoms appear in the first four weeks after birth. However, no such specification exists for the diagnostic criteria for GAD in the DSM-5, meaning that excessive worries need to present for a minimum of 6 months. However, some researchers have suggested to diagnose postpartum GAD if the symptoms meet the DSM criteria for at least one month instead of six months (Misri et al., 2015).

Table 1.1

DSM-5 Diagnostic Criteria Generalised Anxiety Disorder

Criteria	Description
A	Excessive anxiety and worry (apprehensive expectation), occurring more days than not for at least 6 months, about a number of events or activities (such as work or school performance).
B	The individual finds it difficult to control the worry.
C	The anxiety and worry are associated with three (or more) of the following six symptoms (with at least some symptoms having been present for more days than not for the past 6 months). <ol style="list-style-type: none"> 1. Restlessness, feeling keyed up or on edge. 2. Being easily fatigued. 3. Difficulty concentrating or mind going blank. 4. Irritability. 5. Muscle tension. 6. Sleep disturbance (difficulty falling or staying asleep, or restless, unsatisfying sleep).
D	The anxiety, worry, or physical symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
E	The disturbance is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication) or another medical condition (e.g., hyperthyroidism).
F	The disturbance is not better explained by another medical disorder (e.g., anxiety or worry about having panic attacks in panic disorder, negative evaluation in social anxiety disorder [social phobia], contamination or other obsessions in obsessive-compulsive disorder, separation from attachment figures in separation anxiety disorder, reminders of traumatic events in posttraumatic stress disorder, gaining weight in anorexia nervosa, physical complaints in somatic symptom disorder, perceived appearance flaws in body dysmorphic disorder, having a serious illness in illness anxiety disorder, or the content of delusional beliefs in schizophrenia or delusional disorder).

Prevalence of Postpartum Anxiety

Prevalence of the different postpartum anxiety disorders varies by study population, screening or diagnostic tool, and the investigated postpartum period. However, a recent meta-analysis of 13 prevalence studies reports the overall pooled prevalence of any postpartum anxiety disorder to be 8.56%, for GAD to be 3.59%, for OCD to be 2.49%, for PD to be 1.66%, for social phobia to be 1.28%, for agoraphobia to be 0.68% and for specific phobia to be 0.03%, (Goodman et al., 2016). Another recent review reports an overall postpartum anxiety prevalence of 9.9% (Dennis et al., 2017) and a recent narrative review concludes that prevalence of postpartum anxiety ranges widely from 13 to 40% (Field, 2017). Anxiety with comorbid depression has been found to be prevalent in approximately two thirds of postpartum women (Austin et al., 2010). Regarding prevalence rates in the UK specifically, a report by the

National Society for Prevention of Cruelty to Children (NSPCC) has estimated that 86,020 women (100-150/1000) suffer from mild to moderate depressive illness and anxiety states. Recently 2300 women in the UK were surveyed about their experiences of perinatal mental health and associated care (Royal College of Obstetricians and Gynaecologists, 2017). The report highlighted that 69% of the respondents experienced anxiety.

Risk Factors of Postpartum Anxiety

Several factors which can put women at a greater risk of developing postpartum anxiety have been identified. These broadly include circumstances of the birth, previous mental health, social health, as well as other socio-economic and demographic variables.

Circumstances of birth. Several studies show that the birth experience can put women at risk of developing postpartum anxiety. Birth-related factors include fear of birth, fear of death during birth and a negative perception of the recent birth experience including feeling anger, fear or emotional detachment, and lack of control during childbirth, having less confidence in self and medical staff, as well as birth-related PTSD (Bell et al., 2016; Shlomi Polachek, Huller Harari, Baum, & Strous, 2014). Regarding birth, delivering an infant prematurely (≤ 27 weeks gestation) has also been identified as a risk factor for postpartum anxiety (Farr, Dietz, O'Hara, Burley, & Ko, 2014).

Previous mental health. Another risk factor for postpartum anxiety is the woman's mental health before and/or during pregnancy. For example, a history of depressed mood and psychiatric disorders and high trait anxiety were associated with an increased risk of postpartum anxiety (Britton, 2008; Dennis, Falah-Hassani, Brown, & Vigod, 2016). Stress during the perinatal period including perceived stress antenatally and postpartum, childcare stress and stressful life events during the postpartum period were also identified as risk factors (Britton, 2008; Dennis et al., 2016; Yelland, Sutherland, & Brown, 2010).

Social health. Social health factors have also been associated with postpartum anxiety. Negative relationships with their partners, emotional isolation and less support were associated with a greater risk of postpartum anxiety (Figueiredo et al., 2008; Martini et al., 2015; Pilkington, Milne, Cairns, Lewis, & Whelan, 2015; Yelland et al.,

2010). In addition, high perceived stress and low partner social support have been found to be associated with sustained postpartum anxiety (Dennis et al., 2017).

Other. Other identified risk factors associated with postpartum anxiety include low education (Britton, 2008), low self-efficacy (Martini et al., 2015), multiparous parity (Dennis et al., 2016), child's temperament (Agrati et al., 2015), maternal attitudes (Sockol, Epperson, & Barber, 2014), smoking throughout the pregnancy (Farr et al., 2014), history of pregnancy loss (Giannandrea, Cerulli, Anson, & Chaudron, 2013), unwanted pregnancy (Engle, Scrimshaw, Zambrana, & Dunkel-Schetter, 1990), and prenatal care dissatisfaction (Barnett & Parker, 1986).

Impact of Postpartum Anxiety

Untreated postpartum anxiety issues are associated with adverse effects on the physical and psychological health of the mother, child, and family, as well as potential costs to the society.

Impact on the mother and child. For mothers, anxiety postpartum has been associated with low parenting warmth, involvement, efficacy and satisfaction, maternal self-confidence, as well as high parenting hostility (Highet, Stevenson, Purtell, & Coo, 2014; Reck, Noe, Gerstenlauer, & Stehle, 2012; Seymour, Giallo, Cooklin, & Dunning, 2015). This association was stronger when anxiety was co-morbid with depression (Seymour et al., 2015). In addition, women with postpartum anxiety reported significantly lower bonding than mothers without mental health issues (Müller et al., 2016; Tietz, Zietlow, & Reck, 2014). Postpartum anxiety can also affect infant feeding. It has been shown that women with postpartum anxiety are less likely to initiate breastfeeding, breastfeed exclusively and more likely to terminate breastfeeding earlier. Postpartum anxiety was also associated with reduced self-efficacy, increased breastfeeding difficulties, and it was sought to negatively affect breastfeeding behaviours and breast milk composition (Fallon, Halford, et al., 2016; Paul, Downs, Schaefer, Beiler, & Weisman, 2013).

Regarding the effects of postpartum anxiety on the child specifically, a review suggests effects on somatic, developmental, and psychological outcomes of children, with the strongest evidence for negative effects on somatic (e.g. infant colic and recurrent abdominal pain at school age) and psychological (e.g. behavioural and emotional problems and child temperament) outcomes (Glasheen, Richardson, & Fabio, 2010). However, the evidence of an effect on child development is inconclusive.

Impact on the society. Concerning the effect on the society, postpartum anxiety has also been shown to be associated with increased maternal health care utilisation (Paul et al., 2013). A UK report from 2014 regarding the cost of perinatal mental health problems found that those problems carry a total economic and social long-term societal cost of about £8.1 billion for each one-year cohort of births (Bauer et al., 2014). For perinatal anxiety specifically, the estimated cost per woman is £14,017 related to the impact on children (including pre-term birth, cognitive impairment, emotional problems, conduct problems and chronic abdominal pain) and £20,794 for maternal health, social care use, quality-adjusted life-years losses and productivity losses.

Identification of Postpartum Anxiety

Given the risk factors and the impact of untreated postpartum anxiety, the availability of appropriate tools for identifying mental health issues is of great importance. Unfortunately, postpartum mental health issues are often not detected or treated (Bauer et al., 2014; Goodman & Tyer-Viola, 2010; Hendrick, 2003). A review of observational studies of GPs' recognition and treatment of perinatal anxiety identifies substantial gaps in the literature, particularly in relation to anxiety disorders (Ford, Shakespeare, Elias, & Ayers, 2016). A study investigating ethnic disparities in detection of depression and anxiety in primary care during the perinatal period found that up to half of cases were potentially missed, and women from ethnic minorities were twice as likely to have potentially missed common mental disorders (Prady et al., 2016). A recent scoping review shows that there were no articles which specifically addressed the screening of anxiety disorders or symptoms in perinatal immigrant women (Playfair, Salami, & Hegadoren, 2017).

Timing of screening is also important. A NSPCC report from the UK states that “the onset and escalation of perinatal mental illnesses can often be prevented through early identification” (Hogg, 2013, p. 3). It has been suggested to screen for anxiety around 6-8 weeks postpartum at a standard postpartum visit (Misri et al., 2015).

Screening tools. It has also been argued that a significant barrier to identifying and diagnosing anxiety disorders in the perinatal period relates to the difficulty in distinguishing normal versus pathological anxiety (Misri et al., 2015). As previously discussed, some worries and anxiety are normal in this transitional time. For the early identification, diagnosis and treatment it is therefore important to have postpartum

specific screening tools. However, so far there are very few validated screening tools for postpartum anxiety (Misri et al., 2015). Meades and Ayers (2011) reviewed self-report measures used for perinatal anxiety and found that the most common measures were the General Health Questionnaire, State–Trait Anxiety Inventory (STAI), and Hospital Anxiety and Depression Scales (HADS). None of those measures were developed for postpartum anxiety specifically. It was concluded that there is still a need for further validating self-report measures for perinatal anxiety to ensure accurate screening and detection of anxiety symptoms and disorders (Meades & Ayers, 2011).

Recent studies confirm that the STAI can be a reasonably valid screening tool for postpartum anxiety (Dennis et al., 2013; Tendais, Costa, Conde, & Figueiredo, 2014). It has also been suggested that three items of the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) also measure anxiety (Coates, Ayers, & de Visser, 2016; Matthey & Ross-Hamid, 2012; Stephen Matthey, 2008). However, further research is needed to determine the clinical and public health value, as well as the feasibility and acceptability of the EPDS for measuring postpartum anxiety. A recent study found that the Generalized Anxiety Disorder Questionnaire (Newman et al., 2002) could be a viable screening tool used to identify the likely presence of anxiety in postpartum women (Pierson, Prenoveau, Craske, Netsi, & Stein, 2017). The two-item Generalized Anxiety Disorder Scale (GAD-2) is recommended as a screening tool for perinatal anxiety in the current clinical guidance on antenatal and postnatal mental health issued by the NICE (NICE, 2014).

Recently, measures which aim to accurately represent anxiety specific to women in the postpartum period have been developed, for example the Postpartum Specific Anxiety Scale (Fallon, Halford, Bennett, & Harrold, 2016), the Postpartum Worry Scale (Moran, Polanin, & Wenzel, 2014), and the Perinatal Anxiety Screening Scale (Somerville et al., 2014). All three showed promising results in terms of validity.

Screening and identification in the UK. In the UK the NICE clinical guidelines on antenatal and postnatal mental health recommend that a possible perinatal mental illness should be identified by any health professional involved in perinatal care (NICE, 2014). During the postpartum period, women are cared for by their GPs, midwives and health visitors. Midwives are primarily responsible for the antenatal care and usually discharge women around 10–14 days after birth. Around this time health visitors and GPs become a women’s primary care contact. The GP generally sees

women at 6–8 weeks postpartum for a routine check-up. Postpartum women are also in regular contact with their HV during the first year postpartum.

The NICE guidance recommends that GP are the first in line in terms of assessment and management of perinatal mental health problems. It is further recommended that HVs ask anxiety identification questions (GAD-2 scale) at 4–6 weeks and 3–4 months postpartum as part of health visitors' general discussion about woman's mental health and well-being (NICE, 2014). A qualitative study found that HVs see themselves as ideally placed for identifying and assessing women's psychological health, but HVs participating in this study did not mention identification of postpartum anxiety disorders (Jomeen, Glover, Jones, Garg, & Marshall, 2013). A review reveals that public health nurses use a variety of methods to identify women with perinatal mental health problems (e.g. formal screening tools, clinical skill, intuition), but the identified studies focussed on depression rather than anxiety (Noonan, Galvin, Doody, & Jomeen, 2016). Besides HVs in the UK being well-placed to identify postpartum anxiety, their role also includes referral to other health care services which offer appropriate treatment if needed (Department of Health, 2014; NICE, 2014). Postpartum anxiety treatment options are discussed in more detail in the next section.

Treatment of Postpartum Anxiety

Once postpartum anxiety issues are successfully identified and/or diagnosed it is important to offer women appropriate treatment. Postpartum women with anxiety disorders should receive timely and efficient intervention which include symptom relief for the women whilst ensuring the baby's safety (Misri & Kendrick, 2007). It is also important that treatments target postpartum specific concerns (e.g. self, motherhood or relationships) to provide greater acceptance and benefit to postpartum women (Alderdice, McNeill, & Lynn, 2013; O'Connor, Monk, & Burke, 2016; O'Mahen et al., 2015).

Treatment approaches. Which treatment strategy is chosen depends on the type of symptoms and illness severity. Non-pharmacological approaches are often the first-line choice for mild to moderate postpartum anxiety. For moderate to severe postpartum anxiety a pharmacological approach or a combination of both pharmacological and non-pharmacological approaches is often used (Misri et al., 2015). Pharmacological treatments are associated with potential risks (side effects from the

medication), especially for breastfeeding women. However, those must be weighed against the risks of the postpartum anxiety going untreated and its consequences (Misri et al., 2015). In addition, women might hesitate to take medication due to the fear of stigmatisation and potential effects on the baby (Misri et al., 2013). It has also been discussed that both pharmacological and non-pharmacological treatment approaches are associated with positive and negative outcomes in perinatal women and a treatment decision is never risk-free (Misri & Kendrick, 2007). So far, research evidence on non-pharmacological treatments is far from adequate and therefore the recommended first-line treatment for severe and persisting postpartum illnesses are often pharmacological treatments (Misri et al., 2015).

The NICE clinical guidance on antenatal and postnatal mental health recommends cognitive-behaviour therapy (CBT)-based self-help materials with support (either face to face or by telephone) for woman with persistent subthreshold symptoms of postpartum anxiety and for women with a postpartum anxiety disorders either low-intensity psychological intervention (e.g. facilitated self-help) or a high-intensity psychological intervention (CBT) (NICE, 2014). CBT and mindfulness-based approaches are discussed in detail as they are used in the treatment evaluated as part of the thesis.

Cognitive Behavioural Therapy. CBT is a widely used psychosocial intervention for a variety of mental illnesses. The aim of CBT is for the client to develop personal coping strategies to change unhelpful cognitions (e.g. thoughts, beliefs, and attitudes) and behaviours, as well as emotional regulation using a variety of cognitive and behavioural techniques (Beck, 2011). Psychoeducation is also an essential part of CBT. It refers to education offered to individuals with mental health illnesses with the aim to provide the client with a better understanding of their condition to help them deal with their condition. Psychoeducation may be important in overcoming denial/stigma and thereby facilitating intervention success (Misri et al., 2015). Meta-analytic syntheses suggest that CBT is a highly effective treatment for anxiety disorders in adults (Bandelow et al., 2015; Olatunji, Cisler, & Deacon, 2010). The NICE recommends CBT for anxiety in their published clinical guidelines (NICE, 2011).

So far, there are very few studies evaluating the efficacy of CBT for anxiety during pregnancy or during the postpartum period (Austin et al., 2008; Misri, Reebye,

Corral, & Mills, 2004). One randomised controlled trial ($n = 277$) evaluated the effectiveness of an antenatal cognitive behavioural group intervention for the prevention of postpartum depression and anxiety. The study reported a significant improvement in anxious symptomatology for all women undertaking the CBT intervention during pregnancy (Austin et al., 2008). However, the CBT intervention was not found to be superior to the control condition (information booklet). Another study evaluated the benefits of adding CBT to an antidepressant treatment for women with postpartum depression and comorbid anxiety (Misri et al., 2004). The 12-week randomised controlled trial found that both antidepressant treatment and combination treatment were effective in reducing depression and anxiety symptoms, but in acutely depressed/anxious participants no additional benefit of the combination treatment was found.

Most studies to date have evaluated CBT for postpartum depression and comorbid anxiety, rather than anxiety alone. A structured 8-session psychoeducational and CBT group treatment for postpartum adjustment problems was found to lead to a significant decrease in anxiety (Griffiths & Barker-Collo, 2008). A pilot study evaluating a 6-week CBT group treatment found that anxiety reduced significantly in perinatal women with a primary anxiety disorder, as well as that the participants reported high treatment acceptability and satisfaction (Green, Haber, Frey, & McCabe, 2015). Similarly, a recent review identifies two case reports which showed that CBT, individually or in combination with medication (selective serotonin reuptake inhibitors) can lead to significant improvements in the symptomatology of postpartum OCD (Marchesi et al., 2016). A pilot randomised controlled trial found that time-intensive CBT is effective in treating postpartum OCD (Challacombe et al., 2017). However, there are still very few studies investigating CBT for postpartum anxiety. It is therefore difficult to draw conclusions about its effectiveness (Marchesi et al., 2016; McBride & Kwee, 2016; Misri et al., 2015; Misri & Kendrick, 2007).

Despite the limited evidence, CBT is nonetheless recommended as the first-line of treatment for postpartum women with an anxiety disorder, especially for lactating women (Abramowitz, Larsen, & Moore, 2006; Marchesi et al., 2016; Misri et al., 2015; Weisberg & Paquette, 2002). The lack of conclusive data clearly indicates a strong need for more research evaluating CBT for anxiety in the postpartum period. It is important for postpartum anxiety to provide effective and evidence-based treatment options for these disorders.

Relaxation and mindfulness-based interventions. Relaxation techniques include progressive muscle relaxation and diaphragmatic breathing. The positive effect of relaxation has mostly been investigated and demonstrated during the antenatal period (Fink, Urech, Cavelti, & Alder, 2012). Halonen and Passman (1985) found that antenatal relaxation treatments reduced postpartum distress.

Mindfulness refers to the act of focusing one's attention intentionally on internal and external experiences which are occurring in the present moment (Kabat-Zinn, 1994). In recent years, mindfulness-based interventions have increased in popularity. Examples of popular interventions are mindfulness-based stress reduction (Kabat-Zinn, 1990) and mindfulness-based cognitive therapy (Segal, Williams, & Teasdale, 2002). A review also provides evidence for the effectiveness of mind-body interventions in reducing anxiety in women during the perinatal period (Marc et al., 2011). A recent systematic review ($n = 18$ studies) suggests that mindfulness-based interventions including mindfulness-based cognitive therapy, mindfulness-based stress reduction and integrated mindfulness yoga practices resulted in reductions of perinatal anxiety of moderate to large effect (Shi & MacBeth, 2017).

As both CBT and relaxation and mindfulness-based interventions are highly structured, the content can also be provided in a self-help format. Self-help approaches, which can either be in paper version or an Internet-based format, are often referred to as bibliotherapy (Marrs, 1995). Self-help treatments are designed to allow people to work through written therapy material without or minimal assistance of a therapist or other mental health professionals. Meta-analyses show robust effects for bibliotherapy in a paper format in treating diagnosed anxiety disorders (Den Boer, Wiersma, & Van Den Bosch, 2004).

Taken together, CBT and mindfulness-based approaches are often the first-line choice for mild to moderate postpartum anxiety and the NICE recommends CBT-based self-help with support for persistent subthreshold anxiety and anxiety disorders postpartum. Considering the availability of treatment options, it is important to explore how postpartum women seek treatment and what barriers they might encounter or perceive in accessing treatment.

Postpartum Help-seeking and Treatment Barriers

Understanding postpartum help-seeking behaviours, as well as barriers influencing this behaviour is of great importance to be able to tailor and improve mental health treatments for this population (O'Mahen & Flynn, 2008).

Postpartum help-seeking. Help-seeking behaviour for health issues has been described as a decision-making process in which problem-focused and planned behaviour lead to seeking help from formal, informal and self-help sources (Cornally & McCarthy, 2011; Rickwood & Thomas, 2012). Despite the availability of effective pharmacological and non-pharmacological treatments, most individuals with anxiety issues reported to not have sought help for their mental issues in a survey (Roness, Mykletun, & Dahl, 2005).

During the postpartum period, women experiencing emotional difficulties have been shown to be reluctant to seek help, especially women with anxiety symptoms (Prevatt & Desmarais, n.d.; Vesga-López et al., 2008; Woolhouse, Brown, Krastev, Perlen, & Gunn, 2009). A survey of perinatal women found that more women reported consulting friends and family about symptoms (83%) than health care professionals (50%) (Henshaw, Sabourin, & Warning, 2013). Help-seeking behaviour of perinatal women has been shown to be influenced by social, socio-demographic and clinical factors (Fonseca & Canavarro, 2017; Fonseca, Gorayeb, & Canavarro, 2015). Regarding social factors, for example, a study revealed the importance of encouragement to seek professional help for mental health problems from the male partner of the woman (Fonseca & Canavarro, 2017). A survey explored sociodemographic and clinical characteristics of perinatal women with depressive symptoms and their influence on help-seeking from healthcare professionals (Fonseca et al., 2015). This survey found that younger and married women less frequently sought help, as well as women with no history of psychiatric/psychological problems and treatments.

In brief, some women with emotional difficulties postpartum can be more reluctant to disclose and seek help and postpartum help-seeking is influenced by social, socio-demographics and clinical factors. Common barriers to help-seeking and accessing treatment are discussed in more detail in the following section.

Postpartum Treatment Barriers. Common barriers to help-seeking and treatment uptake reported by postpartum women with psychological distress include:

practical and structural challenges, mental health literacy, health care provider issues and stigma (S. Button, Thornton, Lee, & Ayers, 2017; Fonseca et al., 2015).

Practical and structural challenges. Women in the postpartum period are confronted with new or additional responsibilities which often leave them housebound or with difficulty to travel. In addition, “finances”, “being too busy”, “lack of time” and “childcare issues” are among the most commonly reported barriers to accessing treatment in the postpartum period (Fonseca et al., 2015; Goodman, 2009; Woolhouse et al., 2009).

Mental health literacy. Mental health literacy refers to public knowledge and beliefs about mental disorders (Jorm, 2000). In a UK report surveyed women reported that there is poor awareness among healthcare professionals of the range of mental health conditions. Women also reported that despite having heard of postpartum depression, they felt unable to recognise the symptoms, had not heard about the range of other perinatal conditions and felt that antenatal classes often failed to mention mental wellbeing or only focused on baby blues and postpartum depression (Royal College of Obstetricians and Gynaecologists, 2017). No or limited knowledge about mental health issues and disorders has been identified as barrier to seeking help in the perinatal period, for example, women may not be aware that something is wrong (S. Button et al., 2017; Fonseca et al., 2015). Especially women without a history of psychological problems and treatment identified more knowledge barriers which keep them from seeking professional help (Fonseca et al., 2015).

Health care provider issues. Another help-seeking barrier relates to health care provider issues (S. Button et al., 2017; Foulkes, 2011; Reilly et al., 2014). A qualitative meta-synthesis of public health nurses’ role in the identification and management of perinatal mental health problems shows that availability and adequacy of referral pathways and time were commonly identified barriers (Noonan et al., 2016). A meta-synthesis of UK women’s experiences of seeking help for perinatal distress highlights the importance of continuity of care and of health care professionals to be open, non-judgemental and accepting towards women’s feelings and experiences, as well as that women understand the role of the health care provider (Button et al., 2017). A qualitative study also found that health care professionals’ knowledge about mental health issues is also important (Foulkes, 2011). The same study found that postpartum women were less likely to seek help if they were not asked about their emotional health

by a health care professional. Women who were asked were also less likely to seek help if they were not referred for support or treatment (Reilly et al., 2014). Among a sample of surveyed women in the UK, many reported that they did not see the same healthcare professionals throughout their care or that there was not enough time per appointment and therefore they were unable to develop a relationship in which they felt comfortable enough disclosing their feelings (Royal College of Obstetricians and Gynaecologists, 2017).

Stigma. Being “too embarrassed or no one to talk to” and the inability to disclose feelings has been found to be a significant mental health help-seeking barrier among postpartum women (Dennis & Chung-Lee, 2006; Woolhouse et al., 2009). In addition, being worried about being seen as a “bad mother” is another barrier (Button et al., 2017). Similarly, a UK report found that the most common reasons for feeling uncomfortable to talk to a healthcare professional among perinatal women were concern about mental health problems being noted on their medical records (40%), the stigma associated with mental illness (28%) and feeling embarrassed (28%) (Royal College of Obstetricians and Gynaecologists, 2017). A thematic analysis of stigma and disclosure of perinatal depression on an online forum revealed that women experienced three different types of stigma: internal stigma, external stigma, and treatment stigma (Moore, Ayers, & Drey, 2016). Internal stigma related to stigmatised attitudes towards themselves, for example feeling of being inadequate as a mother. External stigma related to concerns about healthcare professionals thinking they were inadequate mothers if symptoms were disclosed. Women also mentioned concerns about seeking and adhering to professional treatment, which was categorised as treatment stigma.

Especially in the postpartum period, the stigma may be elevated by expectations and myths which are imposed on mothers by society. There are a variety of often contradictory maternal myths, for example ‘good mother vs. bad mother myth’, ‘traditional vs. non-traditional mother myth’ or the ‘maternal bliss myth’ (Birns & Hay, 1988; Johnston & Swanson, 2003). A qualitative study with mothers demonstrated how unprepared women were for motherhood and how myths of motherhood influenced their expectations (P. Choi, Henshaw, Baker, & Tree, 2005). The study concluded that the discrepancy between myth versus reality leads to feelings of inadequacy. Birns and Hay (1988) stated that “Mothers may try to conform to the myths, to follow the advice given to them. When the myths bear no resemblance to reality, when the advice fails, mothers feel anxious, guilt, and sometimes despair.” (p. 3-4).

Based on the stated barriers, women with emotional difficulties might decide to not to seek help or attend regular face-to-face treatment. Convenient and potentially anonymous access to treatment is therefore a critical issue. One way of providing anonymous and convenient access to treatment is through the Internet.

Utilising the Internet for Treatment

Access to the Internet

According to the Office for National Statistics in 2015 in Great Britain 89% (23.7 million) of households had Internet access and 82% of adults (41.8 million) used the Internet daily or almost daily (Office for National Statistics, 2015). However, there is an inequality in Internet access caused by demographic characteristics such as age, education and economic wellbeing. For example, individuals younger than 65 years, highly educated and of a higher socio-economic status were more likely to have Internet access and use the Internet (Blank, Graham, & Calvino, in press; White & Selwyn, 2013). Similarly, a recent UK report on adults' media use reported that a quarter of adults from lower socio-economic groups do not use the Internet at all and are less likely to use most types of technological device to go online (Ofcom, 2015). White and Selwyn (2013) found that sex, age and number of children in the household did not affect access to the Internet. However, even if Internet access is available there are differences in how skilled users are and what they use the Internet for. Taken together, despite inequality in internet access, the majority of adults in the UK have access to the internet and use it on a daily basis. Adults, including postpartum women, using the internet might seek for health-related information.

Online Health Information Seeking

When using the Internet many individuals search for health-related information or help (Fox & Duggan, 2013; Powell & Clarke, 2014). Furthermore, searching information online has become one of the easiest ways to access and learn about health-related information (Daniels & Wedler, 2015). This is especially the case if the topic of interest is experienced as difficult to mention or discuss or is regarded as a stigmatised illness, such as depression or anxiety (Berger, Wagner, & Baker, 2005; Fox & Rainie, 2002; Kummervold et al., 2002).

It has been demonstrated that individuals with low levels of self-rated health, high levels of perceived emotional distress and those with mental illnesses use the Internet more often to search for health-related information compared to individuals

with high levels of self-rated health, lower levels of perceived stress and without mental illnesses (Gallagher & Doherty, 2009; Murray, 2012; Oh & Song, 2017; Powell & Clarke, 2006). The Internet is often used to search for and access information about mental health (Lam-Po-Tang & McKay, 2010; Reavley & Jorm, 2011). For example, a survey of Internet users found that 18% of respondents stated they had searched the Internet for information related to mental health. Likewise, a report from a nationally representative survey from the Pew Internet and American Life Project stated that 26-39% of individuals who searched for health information online looked at mental health-related information (Fox & Rainie, 2000, 2002).

Similar to Internet access and use in general, research has also shown that there may be an online health seeking divide. For example, a telephone survey showed that older age groups, individuals who were unemployed and those with only a primary-level education were least willing to use the Internet as a source of information regarding health (Gallagher & Doherty, 2009). Despite the stated inequalities in access, use and online health information seeking, statistics show that the vast majority of individuals in the UK have access to the Internet and that Internet is used to access mental health-related information.

Maternal online information seeking. Among parents, most use the Internet to search for information and social support and parents report being satisfied overall with the resources found on the Internet (Dworkin, Connell, & Doty, 2013; Plantin & Daneback, 2009). Online information seeking often starts in pregnancy (Lagan, Sinclair, & George Kernohan, 2010) and new mothers have been found to use computers for approximately three hours each day, with the majority of the time spent on the Internet (McDaniel, Coyne, & Holmes, 2012). A content analysis of two open-ended questions from a survey of 145 new mothers revealed that mothers most frequently use commercial search engines and social networking websites when on the Internet (Nellsch, Walker, Xie, & Vaughan, 2013). Concerning social networking websites, such as Facebook, new mothers reported an increase in their use during the transition to parenthood, despite increased tasks and responsibilities during this period (Bartholomew, Schoppe-Sullivan, Glassman, Kamp Dush, & Sullivan, 2012).

In an online survey of 157 new mothers, online resources were reported as useful when feeling isolated and restricted by their baby's schedule (McDaniel, Coyne, & Holmes, 2012). Mothers who actively participated in online parenting message

boards used those to develop instrumental support systems (Drentea & Moren-Cross, 2005). A recent online cross-sectional survey completed by 546 perinatal women found that 31.3% of respondents had prior knowledge of mental health illness websites. (Fonseca, Gorayeb, & Canavarro, 2016). The study also showed that perinatal women with a positive screen for a mental health issue reported greater use and acceptance of online resources, particularly of informative websites. When searching online for mental health related information, support and help, postpartum women might come across Internet-supported therapeutic mental health treatment options. Considering that postpartum women frequently access and use the Internet for information and support, Internet-supported interventions might be an attractive option as an alternative or in addition to other sources of help.

Internet Treatments

One of the newer approaches of providing and delivering psychological interventions is via the Internet with the first research trials conducted in the late 1990s (Andersson, Carlbring, Ljótsson, & Hedman, 2013). Over the last few decades this approach has gained increasing popularity with a large number of Internet-supported interventions developed for a range of health and mental health issues including pain (Cuijpers, van Straten, & Andersson, 2008), addiction (Gainsbury & Blaszczynski, 2011), a variety of mood and anxiety disorders and stress (Andersson et al., 2013; Gavin Andrews et al., 2010; Barak, Hen, Boniel-Nissim, & Shapira, 2008) and lifestyle behaviours (e.g. weight loss, exercise) (Van Den Berg, Schoones, & Vlieland, 2007; Weinstein, 2006). Internet-supported interventions have also been developed for different populations, such as children and adolescents (Calear & Christensen, 2010; Siemer, Fogel, & Van Voorhees, 2011), students (Farrer et al., 2013) and older adults (Preschl, Wagner, Forstmeier, & Maercker, 2011). These interventions are not meant to act as a replacement of in-person interventions, but can act as an alternative, addition or gateway to in-person treatment (Barak & Grohol, 2011).

Types of Internet treatments. There are several different ways of offering mental health interventions online. For clarity, Barak, Klein, and Proudfoot (2009) classified Internet-supported interventions into four categories: (i) web-based interventions; (ii) online counselling and therapy; (iii) Internet-operated therapeutic software; and (iv) other online activities. Online counselling and therapy uses interpersonal communication via email, chat or video to deliver counselling or therapy to individuals or groups in either a synchronous or asynchronous manner. Internet-

operated therapeutic software includes robotic simulation, rule-based expert systems, gaming, and 3D virtual environments. The category “other online activities” consists of blogs, podcasts, online, support groups, and online assessments. As a web-based intervention was investigated as part of this thesis, the category “web-based interventions” will be presented in more detail.

Web-based interventions. A web-based intervention has been defined as:

A primarily self-guided intervention program that is executed by means of a prescriptive online program operated through a website and used by consumers seeking health- and mental-health related assistance. The intervention program itself attempts to create positive change and/or improve/enhance knowledge, awareness, and understanding via the provision of sound health-related material and use of interactive web-based components. (Barak et al., 2009, p. 5)

Within this category and definition three sub-types of web-based interventions were outlined: (i) web-based education interventions; (ii) self-guided web-based therapeutic interventions; and (iii) human-supported web-based therapeutic interventions. The authors further specified four major components of web-based interventions which are not mutually exclusive. These components are (a) program content (including educational and therapeutic change content); (b) multimedia use/choices (including pictures/graphics, animations, audio, and video); (c) provision of interactive online activities (including self-assessment and self-monitoring tools); and (d) provision of guidance and supportive feedback (varies from no feedback to sufficient amounts of tailored feedback).

Web-based interventions can run on desktop computers, laptops, tablets, or smartphones. Self-guided, as well as human-supported web-based therapeutic interventions are designed to create positive change on the cognitive, behavioural and emotional level. The content is written therapeutic material presented in a modular and very structured format, which allows individuals to work through the intervention by themselves. The interventions vary by use and number of multimedia, interactive components and the level of guidance and feedback. The content is often adapted from effective face-to-face interventions and based on popular by therapeutic approaches such as CBT or mindfulness.

Internet Treatments in the UK. In the UK, the Five Year Forward View initiative of the National Health Service (NHS) aims to reform current health services and transform care. The initiative highlights the current limited use of technology within the NHS services and determined the priority to increase technology within clinical settings (National Health Service, 2014). Currently, the NICE recommends computer- and Internet-based treatments for anxiety and depression, such as FearFighter, Beating the Blues and Living Life to The Full (NICE, 2006a) and the NHS Choices website promotes five NHS approved websites and smartphone applications for a range of mental health issues (Big White Wall, FearFighter, Ieso digital health, SliverCloud, Sleepio) (National Health Service Choices, July 2017).

Taken together, internet treatments are an innovative approach of offering mental health treatments and in the UK internet mental health treatments are recommended as a treatment option. Before considering this treatment option, it is important to be aware of the benefits, limitations and the evidence base of this approach. These issues will first be discussed in general and then specifically to the postpartum population.

Benefits of Internet Treatments

Overall, the three main benefits of web-based mental health treatments are accessibility, affordability and anonymity (Griffiths, Lindenmeyer, Powell, Lowe, & Thorogood, 2006; Hilgart, Thorndike, Pardo, & Ritterband, 2012; Mohr, Burns, Schueller, Clarke, & Klinkman, 2013; Murray, 2012).

Accessibility. Web-based interventions can be accessed from a variety of technological devices such as a computer, laptop, tablet or smartphone. The interventions can also be accessed as often as wanted, at any time and any place where the user has an Internet connection. This allows the user to access the intervention at their convenience, which may facilitate learning and retention (Andersson & Titov, 2014). Most time constraints of face-to-face interventions do not exist and communication with a therapist can be asynchronous (Carlbring & Andersson, 2006). Interventions can also be used by a large number of individuals simultaneously and from remote or rural areas where the availability of face-to-face mental health services may potentially be scarce. Barak and Grohol (2011) argued that Internet interventions provide the opportunity for achievable population-wide prevention and treatment of mental illnesses.

Affordability. In England access to psychotherapy via the NHS is usually free of charge, but potential clients often must go on a waitlist. Private psychotherapy sessions can range from £10 and £60 per session (British Association for Counselling & Psychotherapy - It's Good to Talk, July 2017). However, in other countries such as the United States of America it is not uncommon to pay \$100-plus dollars per session (Bryant, 2017, July 26). In comparison, web-based interventions can often be accessed free of charge or for a comparably small one-time or monthly fee. It has been shown that large audiences and people in rural areas can access web-based interventions in a cost-effective manner (Donker et al., 2015; Griffiths & Christensen, 2007; Kaltenthaler et al., 2006; Muñoz, 2010). It has also been argued that Internet interventions have the power to reduce global health disparities, as the interventions can be used over and over without losing their therapeutic power, they can be accessed by people who are not offered treatment by their local health care systems, and they can be shared worldwide without using resources from the population where the intervention was developed (Muñoz, 2010).

Anonymity. Some self-guided web-based interventions can also be accessed by individuals without disclosing any information to health care providers. Hence, these interventions can offer anonymity for individuals with difficulties disclosing their mental health issues (Carlbring & Andersson, 2006; Gega, Marks, & Mataix-Cols, 2004; Rüsich, Angermeyer, & Corrigan, 2005). This is especially important as it is known that individuals with mood and anxiety issues often do not seek help (Roness et al., 2005). Additional benefits are the often self-selected nature of users in Internet interventions. This means that those users may be more motivated to participate and remain in the treatment. Also, if therapeutic guidance is offered, this guidance can be more practical and supportive and thereby offer advantages in fidelity and efficiency of the user's and therapist's time (Andersson & Titov, 2014).

Limitations of Internet Treatments

Limitations of Internet interventions include crisis management, issues concerning digital inequalities and appropriateness of interventions for broad and diverse populations, managing comorbidity, diagnostic issues, communication and role of the therapist, confidentiality, security and legal concerns, as well as dissemination and implementation.

Crisis management. One limitation of Internet interventions is that it can be challenging to implement appropriate mechanisms to identify and manage crisis, including symptom exacerbation, reported self-harm and suicidality, as well as adverse or negative treatment outcomes (Andersson & Titov, 2014; Carlbring & Andersson, 2006). This is especially an issue in newly developed interventions where the effectiveness is not yet established. During contact with the therapist or on web forums the possibility exists that users report self-harm or harm to others. To ensure the users' and others' safety it is necessary to decide if and how/who this would need to be disclosed to. Since users might be attracted to the intervention due to its advertised anonymity, it cannot be assumed that the person concerned would want their mental condition discussed with third parties.

Inequality and inappropriateness. It has been argued that Internet interventions can increase access of minority and underserved populations. However, as previously outlined, there is a digital inequality of Internet access by socio-economic, demographic and ethnic characteristics, so inequality in access to interventions might even be exacerbated (Murray, 2012). Nonetheless, it has also been reported that Internet interventions are accessed by a broad range of people from different cultural/ethnic groups and socio-economic background (Andersson & Titov, 2014). The challenge exists to adapt the design and delivery of Internet interventions, so they can be appropriate for a broad range of people. This is especially important since the extent of cultural adaptation has been shown to have an effect on intervention efficacy (Shehadeh, Heim, Chowdhary, Maercker, & Albanese, 2016).

Diagnosis and comorbidity issues. Another limitation associated with Internet interventions is that symptoms can be assessed but diagnoses of psychiatric illnesses cannot be made reliably using self-report only (Andersson & Titov, 2014). Web-based interventions are also limited by the fact that the vast majority are designed for a single condition, even though there is a high prevalence of comorbidity among mental health illnesses (e.g. co-occurrence of mood and anxiety disorders) (Pollack, 2005). To address this problem, researchers have recently started to use either transdiagnostic or tailored web-based interventions (Andersson & Titov, 2014), which have been shown to be effective for anxiety and depression disorders (Păsărelu, Andersson, Bergman Nordgren, & Dobrea, 2017).

Communication issues. A worry specifically regarding self-guided interventions is that it might lead to less social contact and increased isolation of the user. For human-supported web-based therapeutic interventions, the role and communication with the therapist can be a concern. For example, a review indicates better outcomes for web-based interventions supported by a therapist (Palmqvist, Carlbring, & Andersson, 2007). However, a recent review suggests that the effect of support is smaller than previously reported when compared to unsupported interventions (Baumeister, Reichler, Munzinger, & Lin, 2014).

Therapeutic alliance issues. Therapeutic alliance is considered a central component of successful psychotherapy. Therefore, another concern regarding therapist-supported Internet intervention is whether a therapeutic alliance can appropriately develop when participants are geographically separated (Martin, Garske, & Davis, 2000). A small study compared the working alliance scores of a small sample of mainly female online therapy users with a representative sample of clients of face-to-face therapy and found that the online therapy users felt a collaborative, bonding relationship with therapists (Cook & Doyle, 2002). A more recent study investigated working alliance scores of participants with depression, GAD and social anxiety disorder who underwent a guided Internet-based CBT program (Andersson et al., 2012). The study found that alliance ratings were high in all participants and correlations between working alliance scores and change scores on the mental health outcome measures were small and not statistically significant. Based on the results, the authors concluded that therapeutic alliance may not play a major role in Internet-based CBT (Andersson et al., 2012). Similar to the previous study, a study investigating online psychotherapy for traumatised patients and working alliance found high alliance scores and that working alliance was a less relevant predictor of the therapy outcome (Knaevelsrud & Maercker, 2006). It was concluded that it is possible to establish a stable and positive online therapeutic relationship online.

Confidentiality, security and legal concerns. Another concern of Internet interventions is trying to ensure and maintain the confidentiality, privacy and security of the user's data (British Psychological Society, 2013). To mitigate the risk of potential confidentiality and security breaches it is important to implement secure servers, password protection facilities, firewalls, and data encryption for the website (Abbott, Klein, & Ciechowski, 2008; Mallen, 2005; Manhal-Baugus, 2001). There are few consistent standards and guidance on quality, as well as legal and ethical issues

regarding Internet-supported interventions (Shen et al., 2015). In addition, legal regulations for Internet interventions in general and those supported by therapist vary by country or state (Dever Fitzgerald, Hunter, Hadjistavropoulos, & Koocher, 2010).

Implementation and dissemination issues. Even if the developed Internet intervention is proven to be effective, it can be difficult to implement and disseminate the interventions. This can be due to unfamiliarity and negative attitudes of the public and professionals towards those interventions, as well as willingness of professionals to refer people to those interventions (Andersson & Titov, 2014) and knowledge about the implementation (Drozd et al., 2016).

Efficacy of Internet Treatments

The efficacy of web-based interventions for a variety of mental health conditions is well established. Results from systematic reviews and meta-analyses suggest that the efficacy of Internet-based interventions can be equivalent to face-to-face therapy and superior to control groups with substantial effect sizes for a variety of mental health disorders, including major depression, social phobia, panic disorder, generalised anxiety disorder and stress (Andersson, Cuijpers, Carlbring, Riper, & Hedman, 2014; Andrews et al., 2010; Barak et al., 2008; Callear & Christensen, 2010; Rooksby, Elouafkaoui, Humphris, Clarkson, & Freeman, 2015; Ye et al., 2014). Internet-based interventions are also effective in different populations including children and adolescents (Callear & Christensen, 2010; Rooksby et al., 2015; Ye et al., 2014), students (Davies, Morriss, & Glazebrook, 2014; Farrer et al., 2013), older adults (Preschl et al., 2011) and in regular clinical settings (Andersson & Hedman, 2013). The literature shows that web-based interventions can be effective for a variety of conditions and populations. However, a treatment also needs to be acceptable for the user and healthcare professionals recommending and involved in such treatment approaches.

Acceptability of Internet Treatments

The degree to which potential users, clinicians or other health care professionals are comfortable and willing to use a service is referred to as acceptability (Rush & Scott, 2004). In an online survey (health professionals: $n = 456$; lay people: $n = 648$) Internet interventions were reported to be more acceptable for people with mild to moderate symptoms of depression and anxiety than for people with more severe symptoms. Users of those treatments reported higher acceptability for Internet

treatments than those who had never used such treatments (Gun, Titov, & Andrews, 2011). A meta-analytic review reports good rates of completion, high to very high user satisfaction for computerised interventions for anxiety and depressive disorders and therefore concluded that this form of treatment is acceptable to users (Andrews & Titov, 2010). Similarly, a systematic review suggests that computerised self-help can be an acceptable form of treatment for a proportion of individuals with low to moderate depression (Kaltenthaler et al., 2008). However, a review suggests that Internet mental health treatments are generally perceived as less helpful than face-to-face interventions and that individuals are more likely to use face-to-face therapy (Apolinário-Hagen, Kemper, & Stürmer, 2017). It might be that individuals prefer the social interaction offered by face-to-face therapy.

Attitudes and acceptance of health care professionals regarding Internet treatments range from low to neutral to good (Hennemann, Beutel, & Zwerenz, 2017; Wangberg, Gammon, & Spitznogle, 2007). However, it has been suggested that education and appropriate training could help improve health care professionals' attitudes and acceptance towards Internet-based interventions. (Bruno & Abbott, 2015; Hennemann et al., 2017; Montero-Marín et al., 2015; Wangberg et al., 2007). Overall, Internet treatments seem acceptable to a subgroup of potential users and health care professionals.

Internet Treatments for Postpartum Mental Health

Having discussed the advantages, limitations, efficacy and acceptability of internet treatments in general, it is important to consider these issues specifically for the postpartum population.

Advantages. A NSPCC report from 2013 highlighted that there are currently great gaps in the perinatal mental health services to support postpartum women and their families in England (Hogg, 2013). In England in 2014, 40% of women had no access to specialist perinatal mental health services (Bauer et al., 2014). The UK Maternal Mental Health Alliance as part of the Maternal Mental Health-Everyone's Business campaign published an infographic in 2015 (Maternal Mental Health Alliance, 2015). This infographic highlighted that there were only 15 accredited mother & baby units across England in 2015 and that the provision of specialist community perinatal mental health teams is patchy and that there are tremendous geographical differences. In addition, a UK survey among perinatal women ($n = 2323$) found that

only 19 were referred on to services, but for 38% of the women referred it took over four weeks after referral to be seen and some women reported waiting over a year (Royal College of Obstetricians and Gynaecologists, 2017). The self-help approach and accessibility of many web-based treatments could allow women to start the treatment right away and use it while waiting for talking therapy or other specialised care for example. During the postpartum period specifically, the convenience and accessible nature of Internet interventions might facilitate treatment use and retention. It does not require the attendance of face-to-face sessions and might therefore fit within the demanding and variable schedule women encounter when caring for a new baby. In a qualitative study women reported that the privacy and anonymity provided by an Internet treatment reduced stigma and encouraged adherence (O'Mahen et al., 2015). It was further reported that the format was flexible and therefore fit well with the unpredictable demands of motherhood. Considering the outlined advantages of Internet treatments for postpartum women, Internet interventions could be an appropriate alternative or supplement to regular face-to-face treatment.

Limitations. General imitations as discussed earlier also apply and need to be considered for postpartum women. Issues such as potentially adverse therapy effects, symptom worsening and reported self-harm, suicidality, or harm to the baby are especially important as postpartum women are also caring for a new baby (Brandon, Shivakumar, Lee, Inrig, & Sadler, 2009). It is important that Internet interventions make postpartum women aware of the potential risks and appropriate mechanisms need to be in place to address these issues (e.g. screening for suicidality, regular symptom monitoring).

Needs. Improving suitability and relevance of treatments through personalisation and sensitisation of content is also important (Knowles et al., 2014). The content of Internet-based self-help interventions can be tailored to anxieties, worries, and needs specific to the postpartum period, such as family health, return to work, own well-being, relationships/support, infant care, and partner (Kaitz, 2007). Further studies suggest that maternal concerns are focused on the baby and one's self (Bull, 1981; Fishbein & Burggraf, 1998) and are about family finances, meeting the needs of everyone at home, and being a good mother (Hiser, 1991). A qualitative study of women with perinatal depression investigated specific perinatal needs in order to inform treatment modifications and thereby improve CBT's relevance and acceptability during this period (O'Mahen et al., 2012). Thematic analysis of semi-structured

interviews revealed that mothers experienced internalisation of “motherhood myths”, self-sacrifice, and the management of social support during this period as particularly difficult. For a treatment to be successful it seems essential that these specific maternal concerns are targeted.

Development & evaluation. Despite an extensive body of literature reporting on developing and evaluating web-based interventions for various conditions and populations, relatively little research has focussed on developing and evaluating web-based interventions for women with postpartum mental health issues. Only in the last decade have web-based interventions for postpartum women started to be developed. The results from two recent systematic reviews and one meta-analysis identify a total of nine web-based interventions for the postpartum period (Ashford, Olander, & Ayers, 2016 - Chapter 2; Lau, Htun, Wong, Tam, & Klainin-Yobas, 2017; Lee, Denison, Hor, & Reynolds, 2016). The review by Lee et al. (2016) focussed on web-based interventions for mood disorders in the perinatal period, Ashford et al. (2016 - Chapter 2) reviewed the literature on computer- or web-based interventions for a variety of perinatal mental health issues and the meta-analysis by Lau et al. (2017) looked specifically at therapist-supported Internet-based cognitive behaviour therapy for postpartum stress, anxiety, and depressive symptoms. Interventions identified by the reviews targeted postpartum depression, complicated grief after child loss, and post-traumatic stress. The reviews suggest that web-based interventions can help improve postpartum depressive symptoms (Ashford et al., 2016 – Chapter 2; Lau et al., 2017; Lee et al., 2016). Even though none of the web-based interventions were developed for postpartum anxiety specifically, a few interventions designed for postpartum depression and posttraumatic stress measured anxiety as an outcome. The more recent meta-analysis by Lau et al. (2017) describes that therapist-supported Internet-based cognitive behavioural therapy had a significant effect on improving anxiety symptoms with small to medium effect sizes.

In summary, web-based interventions could be an appropriate alternative or supplement to regular face-to-face treatment for postpartum anxiety. However, no information about the development and evaluation of an intervention specifically targeted at postpartum anxiety has been published. The following section describes the origin and development/adaptation of a first web-based postpartum anxiety treatment, which was part of this thesis.

The WaWa Treatment

WaWa Origin

‘What Am I Worried About’ or WaWa is a self-guided psychoeducation intervention based on cognitive behavioural and mindfulness principles for women who experience low to moderate levels of generalised anxiety postpartum (Rowe et al., 2014). The intervention was developed by researchers from Monash University in Australia and provided to women in a paper-based self-help booklet format.

WaWa Structure and Content

The booklet consists of three overall sections: 1) Is this for me?; 2) Practice; 3) Understanding. The first section ‘Is this for me?’ serves as an orientation and presents the participant with concepts such as generalised anxiety disorder, common worries during the perinatal period, explains the cognitive behavioural and mindfulness models and outlines the program. The desired outcome of the first section is for the user to self-assess need and readiness to engage with WaWa.

The section ‘Practice’ is divided into seven worksheet modules and each module is supported by a 30-minute telephone consultation with a WaWa mental health professional. Each worksheet contains a brief introduction and guided activities with space for participants to record their experiences. The worksheets assist women in identifying, labelling and reframing unhelpful cognitions and practice activities for applying exposure, problem solving and assertiveness techniques. Relaxation and short mindfulness exercises are also part of each module. Each worksheet focusses on life stage-specific examples. Each worksheet also offers the opportunity to identify personal anxiety triggers and thereby personalise the activities. The topic of each worksheet module and its associated desired outcomes and behaviour changes are presented in Table 1.2.

The last section ‘Understanding’ provides the participants with background information about the biopsychosocial model of anxiety and a lay language description of the CBT and mindfulness theories and practice.

Table 1.2

WaWa Worksheet Topics and Associated Outcomes and Behaviour Changes

Topics	Outcomes and Behaviour Changes
1. When my baby cries	Identify and re-frame unhelpful thoughts to reduce avoidance of anxiety-provoking situations and impulsivity and use more skilful responses.
2. Feeding my baby	Think more realistically by gaining an accurate perspective and thereby learning to tolerate uncertainty and being a novice.
3. Managing inconsistent information	Reduce binary thinking, increase confidence, reduce helplessness, enable help seeking, consistent infant care and more assertive responses.
4. My baby's health and safety	Reduce catastrophising and apply risk analysis to separate thoughts from self and reduce avoidance.
5. Leaving my baby to be cared for by someone else	Tolerate unpleasant thoughts and feelings and increase confidence in order to reduce avoidance and improve assertiveness.
6. Comparing myself with others or the way I used to be	Reduce perfectionism and promote tolerance of ambivalence, self-acceptance and confidence.
7. Leaving the house to go out	Increase confidence and calm to reduce avoidance of anxiety-provoking situations.

WaWa Evaluation

The WaWa intervention was tested in Australia in an open pilot study (Rowe et al., 2014). Eighteen women were recruited from Residential Early Parenting Services, which are hospital- or community-based services for postpartum women who experience difficulties adjusting to motherhood and/or have unsettled babies. Of the 18 women consenting to participate in the study, five withdrew after the orientation session due to being too busy or having coincidental difficulties, 13 completed at least one phone consultation, seven completed all six consultations, nine completed the follow-up part of the study and seven took part in the evaluation interview. Reduced mean depression and anxiety scores on the DASS scale (Depression Anxiety Stress Scale; Lovibond, 1995) indicated a significant improvement after the intervention. The program evaluation interviews revealed that all participants experienced WaWa as easy to use, understand and relevant to them. Participants also felt that it improved their knowledge and skills and most found that it helped them manage their anxiety. The majority said that they would recommend the programme to a person in similar circumstances. All except for one woman reported that telephone consultations were a program strength and one participant suggested to implement an audio version of the mindfulness exercise.

In summary, WaWa is a self-help treatment with content specifically developed for postpartum anxiety which has demonstrated preliminary efficacy and acceptability in a pilot study. Based on its characteristics, WaWa was deemed as suitable for adapting it into a web-based version.

Development of an Internet-based WaWa Version (iWaWa)

Developing web-based interventions requires several steps and several factors need to be considered. To help researchers with this process, Ritterband et al. (2003) outlined the following nine steps in developing Internet interventions: (1) Identifying problem area; (2) Ascertain effectiveness of established treatment; (3) Operationalise treatment completely; (4) Consider legal and ethical issues; (5) Transform treatment elements using engaging Internet components; (6) Personalise intervention by identifying elements that can be tailored; (7) Incorporate feedback as a measure of treatment success; (8) Construct Internet program; (9) Test Internet program. The suggested steps were followed during the development of the iWaWa program and the following section will outline how each step was addressed.

Step 1 - Identifying problem area: The problem area was identified through a review of the literature presented in the section “Utilising the Internet for Treatment” in Chapter 1 (p. 41) and the conducted systematic review of computer- and web-based interventions for perinatal mental health issues as presented in Chapter 2.

Step 2 - Ascertain effectiveness of established treatment: Based on the review of the literature presented in Chapter 2 regarding the effectiveness of web-based interventions, it was established that web-based interventions are effective for a variety of conditions including mental health issues in the postpartum period. In addition, WaWa demonstrated preliminary effectiveness in a pilot study in Australia.

Step 3 - Operationalise treatment completely: As WaWa is a self-help book, all critical aspects of the intervention, including specific treatment techniques and procedures were already identified. iWaWa used the same techniques and procedures as WaWa.

Step 4 - Consider legal and ethical issues: Regarding legal issues, a formal collaboration between the WaWa inventors Dr Heather Rowe and Professor Jane Fisher from Monash University and City University of London was set up to develop and evaluate a web-based version of WaWa for the use in the UK. Monash University issued a confidentiality and license agreement in 2015 which allowed City, University

of London to use the WaWa content for this specific research. Concerning ethical issues, the study evaluating iWaWa was registered with the School of Health Science Research Ethics Committee at City, University of London and gained full ethical approval from the London-Dulwich research ethics committee (NRES).

Step 5 – 8: (5) Transform treatment elements using engaging Internet components; (6) Personalise intervention by identifying elements that can be tailored; (7) Incorporate feedback as a measure of treatment success, (8)

Construct Internet program: This was followed by transforming the WaWa treatment elements into a website-based version. To highlight this change, the program was called Internet-based WaWa or short ‘iWaWa’. iWaWa was developed on the Qualtrics Platform (<http://www.qualtrics.com/>) and hosted on a City, University of London blog. For the web-based format, the three main sections were divided up into nine modules (‘Is this for me? Chapter, seven ‘Practice’ chapters and the ‘Understanding’ chapter). Each chapter was created in Qualtrics and a password protected blog page of the iWaWa study website (<https://blogs.city.ac.uk/iwawa/the-iwawa-program/>) contained links to all chapters.

A review of web-based interventions for anxiety on the world wide web was carried out and identified how those treatments transformed psychotherapy elements into engaging Internet components (see Chapter 3). iWaWa was also designed to include all four major components of a web-based intervention by Barak et al. (2008) as outlined in section “Internet Treatments” in Chapter 1 (p. 44).

(A) Program content: The entire WaWa educational and therapeutic change content was used. Only minor modifications were made to fit this study and setting. For example, the wording was changed from ‘book’ to ‘program’ or content about additional worksheets being available as photocopies was not included.

(B) Multimedia use/choices: The iWaWa chapters are made up of text, graphics and audio. Written text of iWaWa was copied, inserted and formatted. Graphics and tables from the WaWa booklet were extracted, converted into JPEG images and added to the chapters at the corresponding location. The content of written mindfulness and breathing exercises of WaWa was audio-recorded and added so participants could listen to it. The audio-recording was spoken by a native UK English speaker (fellow PhD student Rebecca Webb).

(C) Provision of interactive online activities: Interactive components included for example text boxes, self-assessment with sliders, hot spot graphics.

(D) Provision of guidance and supportive feedback: For each of the ‘Practice’ chapters participants were presented with the option to opt-in for a 30-minute support call with the researcher (Miriam Ashford). A phone guide provided by the WaWa developers was modified for the use of this study. The guide consisted of four main parts: (1) Check-in (including clarification of the nature of the call, asking about the past week and rating on the subjective unit of distress scale; (2) Worksheet (discussing and reviewing the worksheet to discuss understanding and progress following a flow depending on participant answers); (3) Time check; (4) Mindfulness exercise (discussing and reviewing the worksheet to discuss understanding and progress following a flow depending on the participant answers); (5) Check-out (post-subjective unit of distress scale rating with discussion of support options if rating is high and encouraging participant to practice and apply what was learned). The guide also had space to record start and end time of each call and space for notetaking by the researcher.

All chapters could be accessed as often as women wanted. Participants were advised to start with Chapter 1 ‘Is this for me?’, but were free to complete the other chapters in any order. In addition, participants could sign up for optional weekly email and/or SMS reminders about the iWaWa program for the duration of the study. Personalisation was avoided to ensure and ascertain anonymity of the intervention to the participants. Two screenshots of the iWaWa program can be found in Appendix 7.2.

Step 9 - Test Internet program: The newly developed iWaWa intervention’s feasibility, acceptability and preliminary effectiveness was tested using a randomised controlled trials (RCT) (see Chapter 7), which is described in more detail in the next section.

Evaluating iWaWa

As previously described, the ninth and last step in developing Internet interventions (Ritterband et al., 2003) calls for evaluating the new intervention’s feasibility, acceptability and preliminary effectiveness.

The stage model of behavioural therapy research. To guide the evaluation of the iWaWa intervention, the stage model of behavioural therapy research was used

(Onken, Blaine, & Battjes, 1997; Rounsaville, Carroll, & Onken, 2006). This model describes three progressive stages of intervention development and evaluation (Onken et al., 1997; Rounsaville et al., 2006). Stage 1 is the feasibility stage and can be divided in two key phases: Stage 1a is concerned with therapy development and manual writing and Stage 1b is concerned with pilot and feasibility testing of final or nearly final interventions. In Stage II the efficacy of piloted interventions is evaluated using randomised controlled trials and effective treatment components are identified. The aim of Stage III is to evaluate transportability of interventions for which efficacy has been demonstrated by at least two RCTs. This includes evaluating issues such as generalisability, implementation, cost effectiveness, and consumer/marketing issues.

Application of the stage model for the iWaWa evaluation. As previously mentioned, WaWa as a booklet version was tested in a small pilot study in a health care setting unique to Australia. For the web- and UK-based version, iWaWa, it is therefore important to repeat the pilot/feasibility work. Therefore, Stage I was deemed most relevant to the current project. Stage 1 and the following section outline how the two key phases (Stage 1a and Stage 1b) were addressed.

Stage 1a. Stage 1a includes therapy development and manual writing. As iWaWa is based on an already written treatment (WaWa), manual writing was considered completed. As specified in more detail earlier, the steps by Ritterband et al. (2003) were followed for the development of the web-based version. However, Stage 1a may also include researching the potential feasibility and acceptability of the new proposed treatment. It is important to investigate acceptability and feasibility in potential users of iWaWa and healthcare professionals who work with postpartum women in the UK. Therefore, a qualitative interview study was designed to explore health visitors' views on the acceptability and potential implementation of web-based interventions for postpartum anxiety (see Chapter 4 & 5) and an online survey was developed to explore whether women with postpartum anxiety are interested in web-based treatments (see Chapter 6).

Stage 1b. For Stage 1b the model proposes the following aims: (i) feasibility of the intervention delivery, (ii) acceptance of the new intervention by the patient, (iii) the ability to recruit sufficient participants from the target population, (iv) clinically significant improvement of the primary outcome over the course of the intervention, (v) and the likely effect size to determine sample size calculations based on contrasting the

intervention group with a control group. Based on these aims a randomised controlled feasibility trial was developed to evaluate iWaWa in women who self-report anxiety in the postpartum period in the UK (see Chapter 7).

In summary, a mixed methods research design was developed, combining a qualitative method (interviews) and different quantitative methods (survey and randomised feasibility trial) to address Stage I (a & b) of the stage model of behavioural therapy research. This research is described in more detail in Chapter 7.

Summary and Aims

Summary

In the time after childbirth some women experience persistent, severe, and debilitating anxieties and worries (O'Hara & Wisner, 2014). If postpartum anxiety is left untreated it can have several adverse outcomes for the woman, infant, family and society (Glasheen et al., 2010; Paul et al., 2013; Seymour et al., 2015). It is therefore important that postpartum women with anxiety can access and receive timely and effective treatment. Despite the availability of effective treatment options, many postpartum women do not access treatment, for example, because they are too busy and/or too embarrassed or have no one to talk too (Woolhouse et al., 2009). These unique barriers experienced by postpartum women highlight the importance of convenient and potentially anonymous access to interventions.

One popular approach of enhancing anonymous access to interventions are self-guided web-based treatments, which allow the user to access treatment on their computer, laptop, tablet or smartphone and work through structured, multimedia and interactive written therapy content with no or minimal support from a mental health care professional (Barak et al., 2009). Self-guided web-based interventions have been shown to be effective, acceptable and cost-efficient for anxiety in a variety of populations (e.g. Andersson et al., 2014). However, little is known about the use of web-based interventions for postpartum anxiety.

This thesis therefore set out to examine the necessity and need of such a treatment and adapt and evaluate a self-guided web-based intervention for women with postpartum anxiety in the UK. Overall, this PhD project hopes to significantly contribute towards the knowledge and availability of appropriate and accessible interventions for women experiencing anxiety in the postpartum period and thereby potentially improve maternal and child health.

Aims and Research Questions

Overall, this thesis has four main aims:

- (i) Examining whether there is a necessity for a web-based postpartum anxiety treatment.
- (ii) Exploring the needs and interest of women with postpartum anxiety and health care professionals (health visitors) in England in a web-based treatment.
- (iii) Developing a web-based treatment based on the findings regarding necessity, need and interest (adapting WaWa).
- (iv) Evaluating the new web-based treatment's feasibility and acceptability among postpartum women with anxiety.

Regarding the four main thesis aims, the specific research questions were as follows:

Examination of the necessity of a web-based postpartum anxiety treatment

1. *Examine the literature regarding web-based interventions for women with perinatal mental health issues.*
 - 1a. What interventions do currently exist and is there a need for a web-based intervention for postpartum anxiety?
 - 1b. What is known about the effectiveness of web-based perinatal mental health interventions?

Exploration of the needs and interest of women with postpartum anxiety and health care professionals (health visitors) in England in a web-based postpartum anxiety treatment

2. *Examine the interest and feasibility of web-based postpartum anxiety treatment among potential users.*
 - 2a. Are women with postpartum anxiety interested and likely to use a web-based treatment?
 - 2b. Is it feasible to reach women with postpartum anxiety through free social media and which women can be reached in terms of

sociodemographic variables and anxiety levels?

3. *Explore the potential acceptability and feasibility of a web-based postpartum anxiety treatment among postpartum health care professional who would be potentially involved in promoting such an intervention.*

3a. What is the experience of health visitors in supporting women with postpartum anxiety in their clinical practice and what are their views on currently available support and services for postpartum anxiety?

3b. What are health visitors' views on the usefulness of web-based interventions for postpartum anxiety in general and iWaWa specifically, as well as the acceptability and possible ways of implementing such interventions in their practice?

Development a web-based postpartum anxiety treatment based on the findings regarding necessity, need and interest (adapting WaWa)

4. *Determine the transformation of WaWa into a web-based version.*

4a. What web-based programs are currently available on the web and how was the treatment content presented (in terms of content format, multimedia approaches and interactive features)?

4b. What are the preferences of women with postpartum anxiety for different web-based treatment formats and therapist support?

Evaluation the adapted WaWa treatment (iWaWa) in terms of feasibility and acceptability

5. *Determine the feasibility of the iWaWa intervention among women with postpartum anxiety.*

5a. Is the iWaWa program feasible in terms of treatment engagement and usability?

5b. Is iWaWa experienced as useful and credible and are users satisfied with it?

- 5c. Does the anxiety level of iWaWa users reduce at the end of the intervention and compared to women with postpartum anxiety who have not used iWaWa?
- 5d. Is an empirical evaluation of iWaWa feasible in terms of recruitment, consent, attrition, follow-up rates, as well as response rates to questionnaires?

An overview of the type of studies which address the above outline research questions can be found in Table 1.3. The table further shows in which chapters the research questions were addressed.

Table 1.3
Overview of Research Questions and the associated Study Types and Chapters

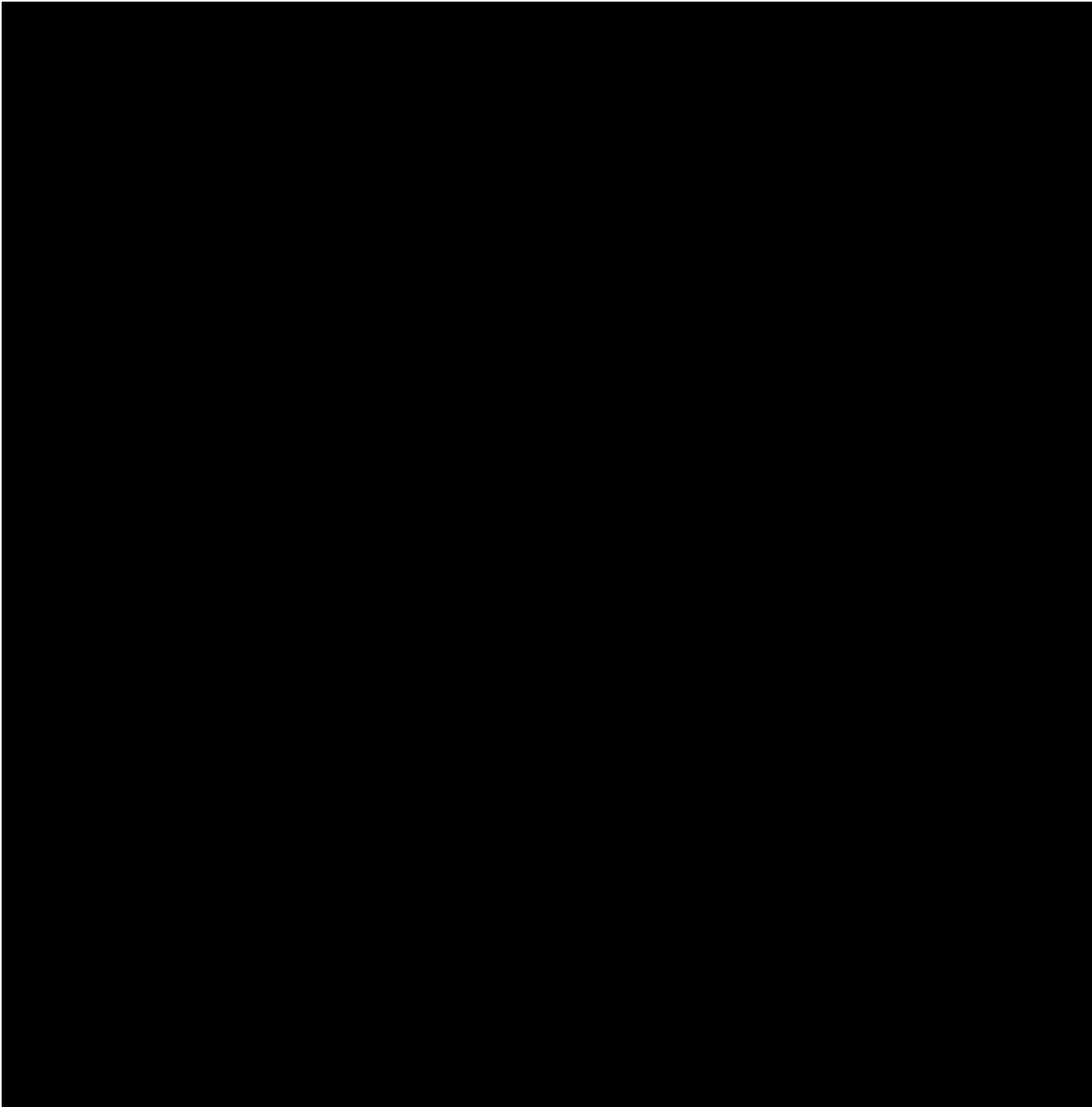
Chapter	Study Type	Research Question
2	Systematic review of the literature (web- and computer-based perinatal mental health treatments)	1a, 1b
3	Systematic review of the web (web-based anxiety treatments)	4a
4	Interview study with health visitors	3a
5	Interview study with health visitors	3b
6	Online survey of perinatal women	2a, 2b, 4b
7	Randomised controlled feasibility trial of iWaWa	5a, 5b, 5c, 5d

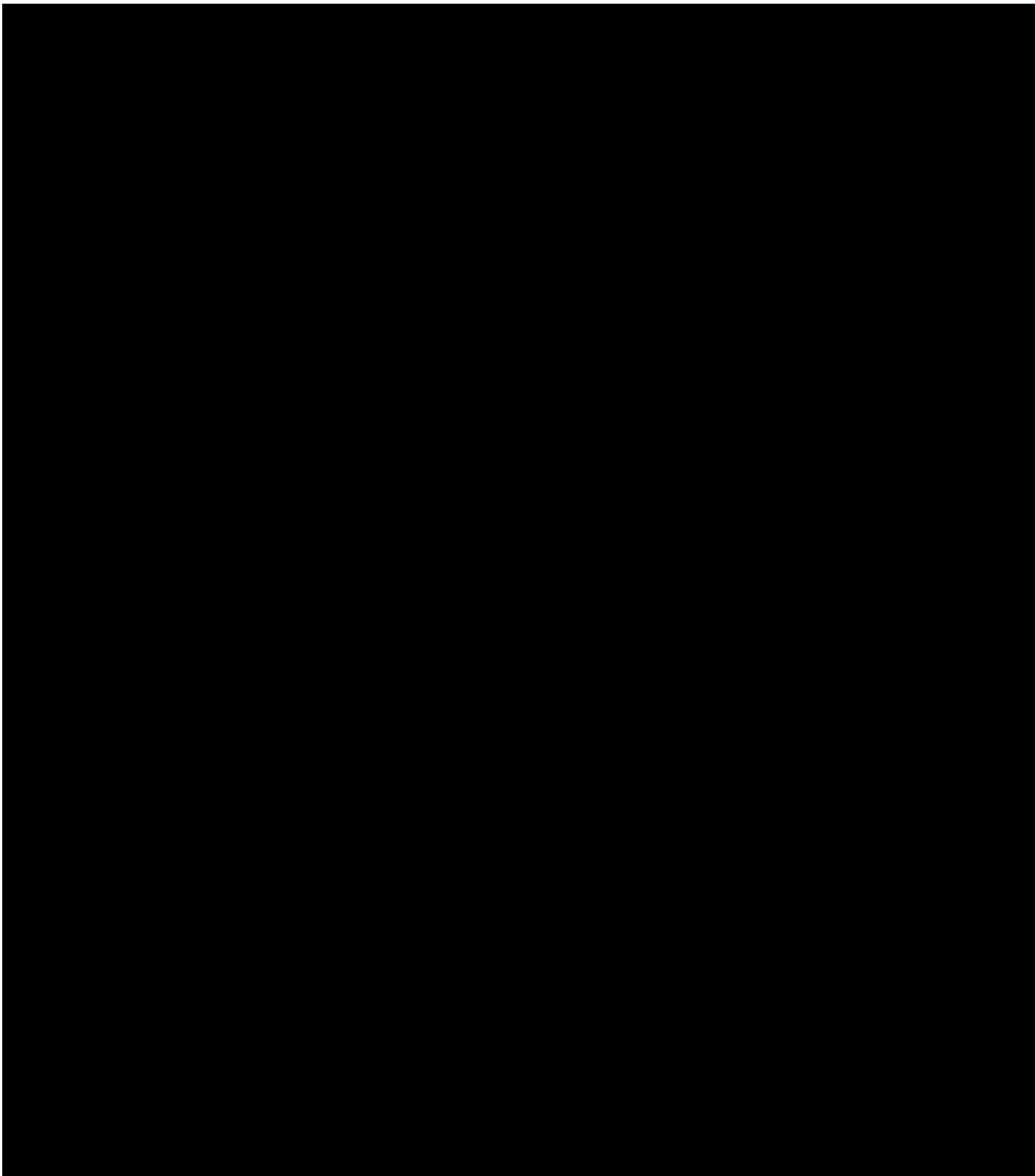
Findings from the studies presented in Chapters 2, 4, 5 and 6 were used to establish the necessity and need for the development of a web-based postpartum anxiety treatment. More specifically, the systematic review of the literature (Chapter 2) regarding perinatal mental health computerised- and web-based treatments established that there is a necessity for a web-based postpartum anxiety treatment. Results from the online survey (Chapter 6) and interview study (Chapter 4 & 5) demonstrate that there is an interest in web-based treatments among women with postpartum anxiety and health visitors identified a need for treatments especially designed for postpartum anxiety. This warranted the search for a postpartum anxiety treatment that could be transformed into a web-based version. The WaWa treatment was identified and its content and structure were deemed appropriate to be transformed into a web-based version.

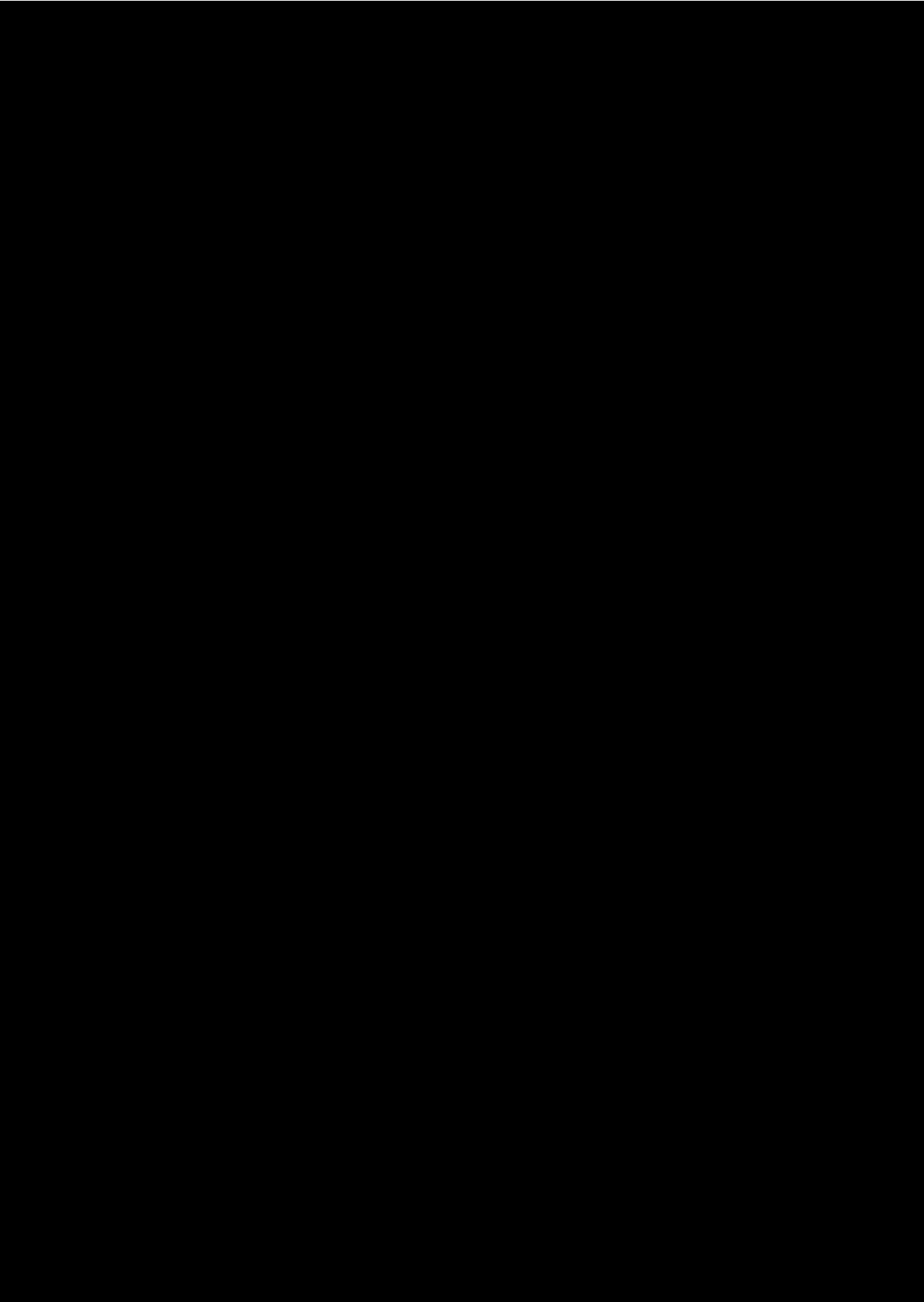
The development of the web-based WaWa version (iWaWa) was informed by the findings regarding treatment format, multimedia use and interactive components from the review of publicly available web-based anxiety interventions (Chapter 3) and the online survey in which potential users disclosed treatment preferences regarding web-based postpartum anxiety interventions (Chapter 6).

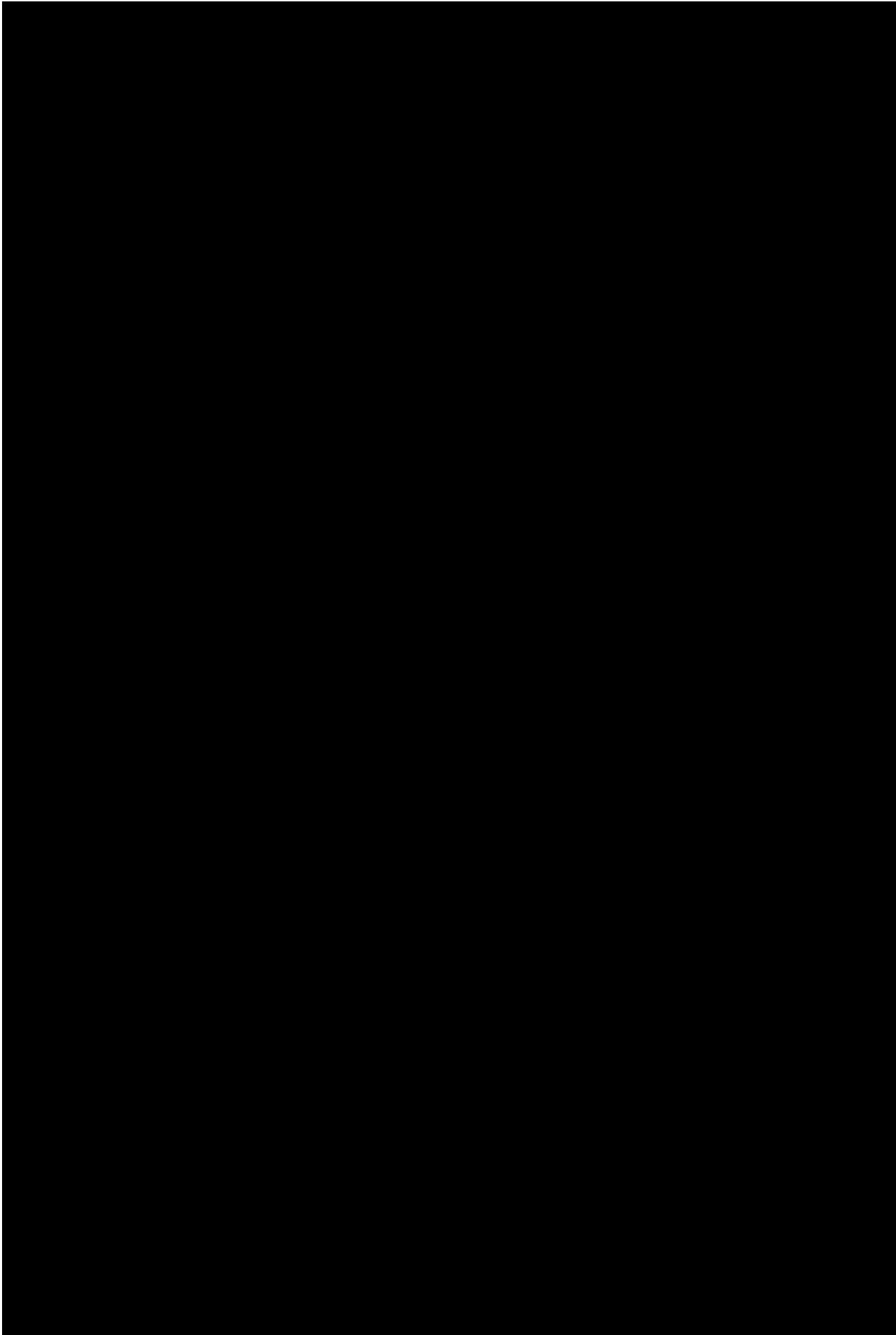
Results from the health care professional interviews (Chapter 4 & 5) and the online survey of potential iWaWa users (Chapter 6) informed the recruitment methodology for the iWaWa randomised feasibility trial.

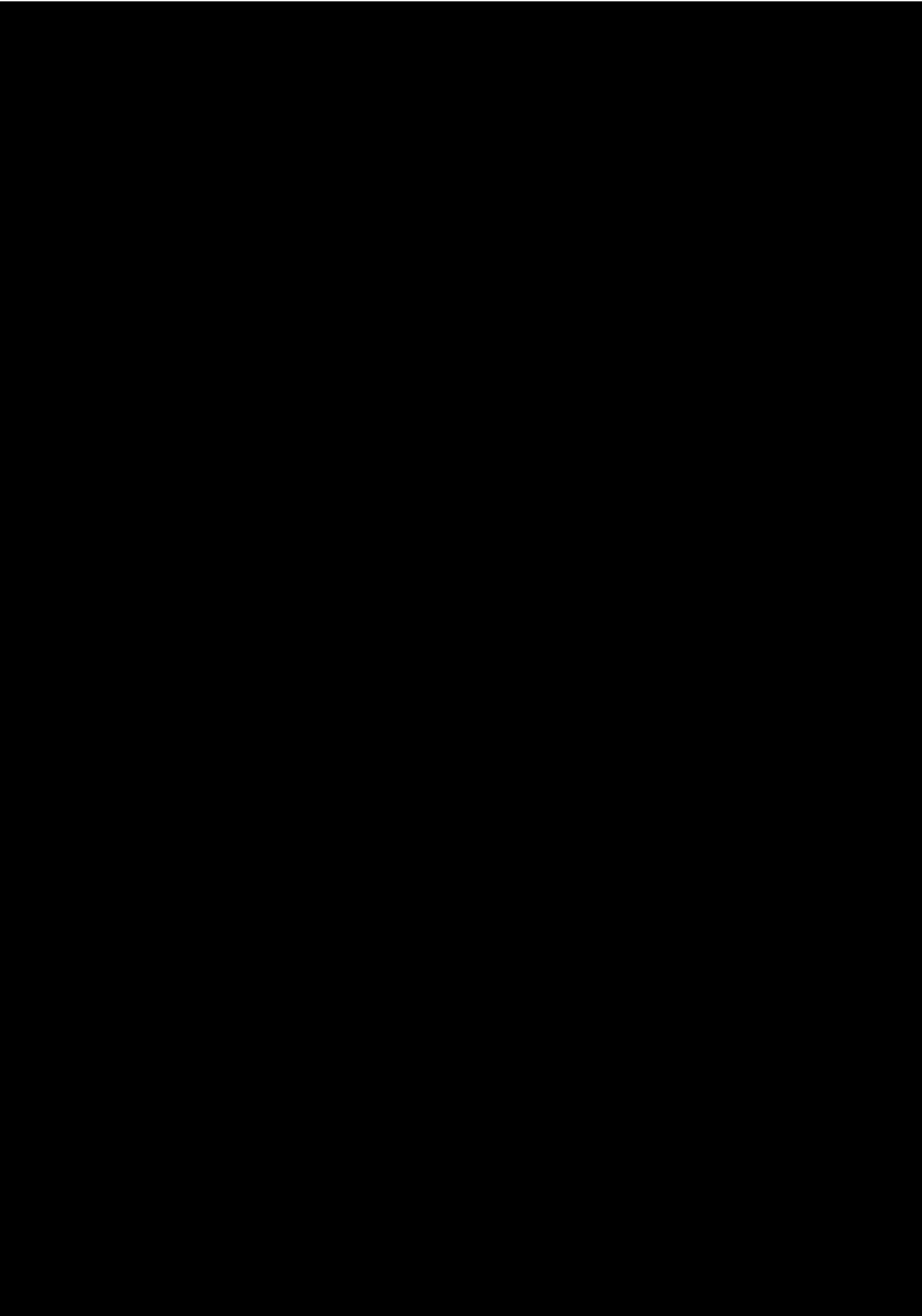
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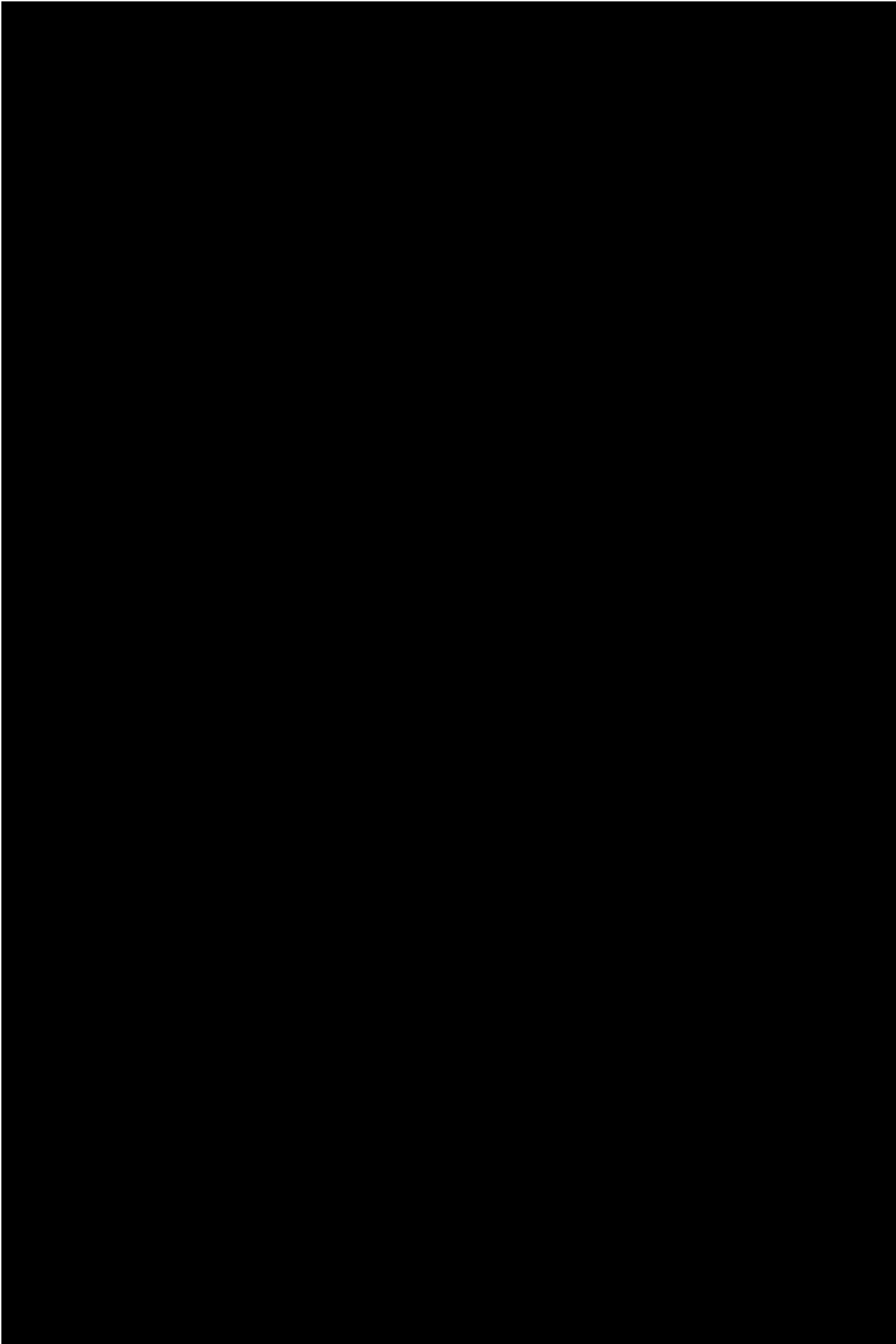


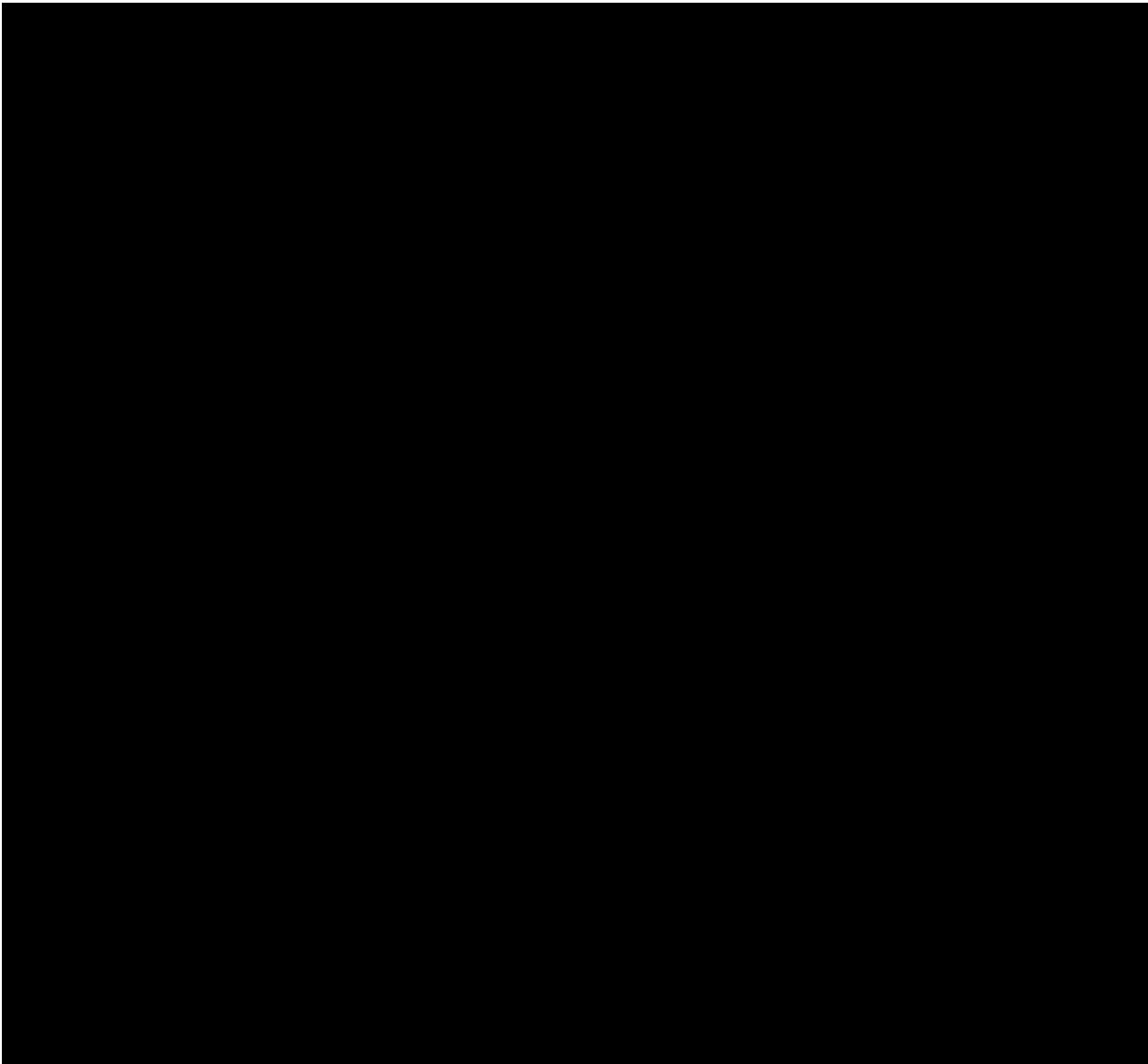


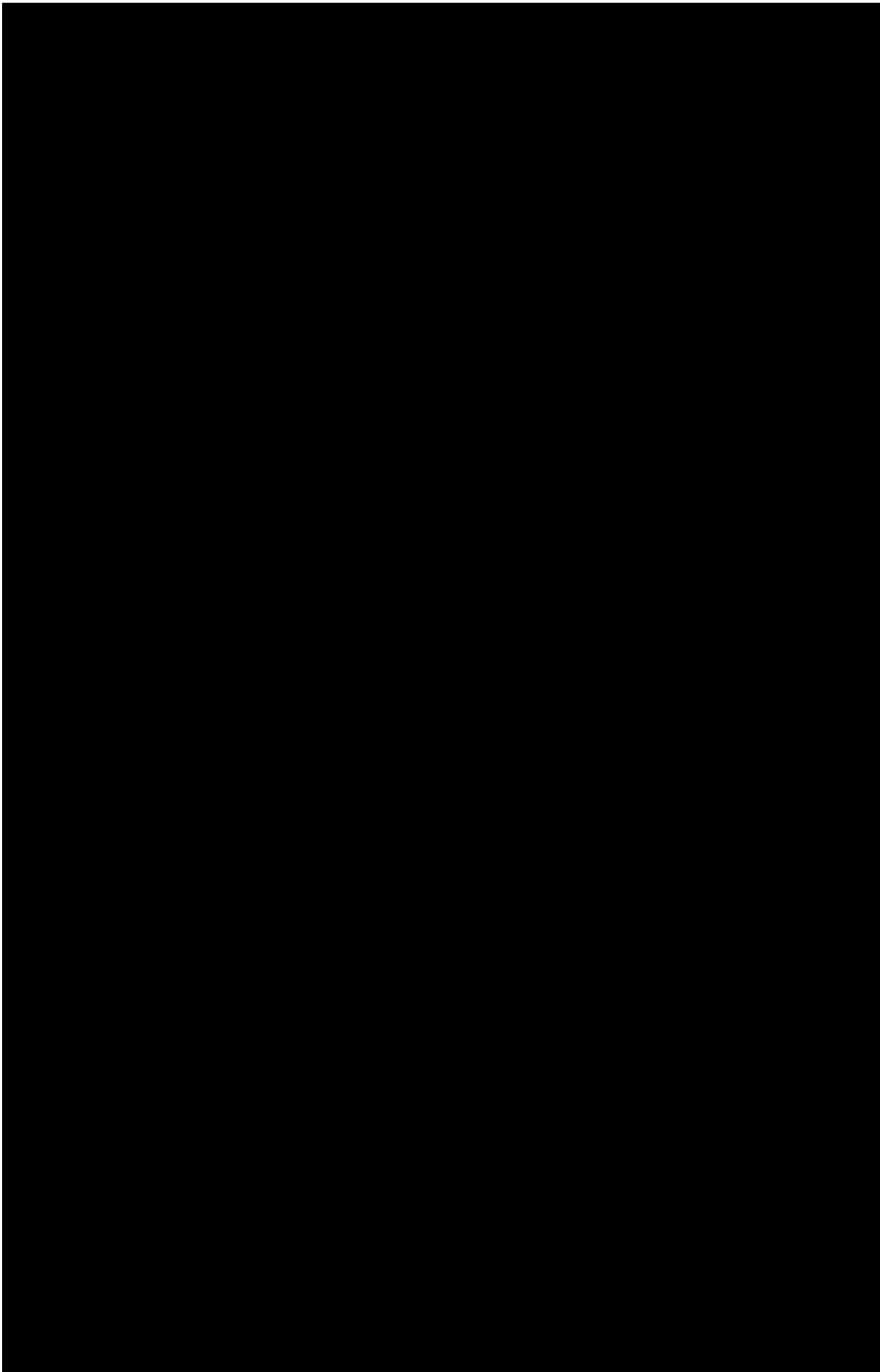








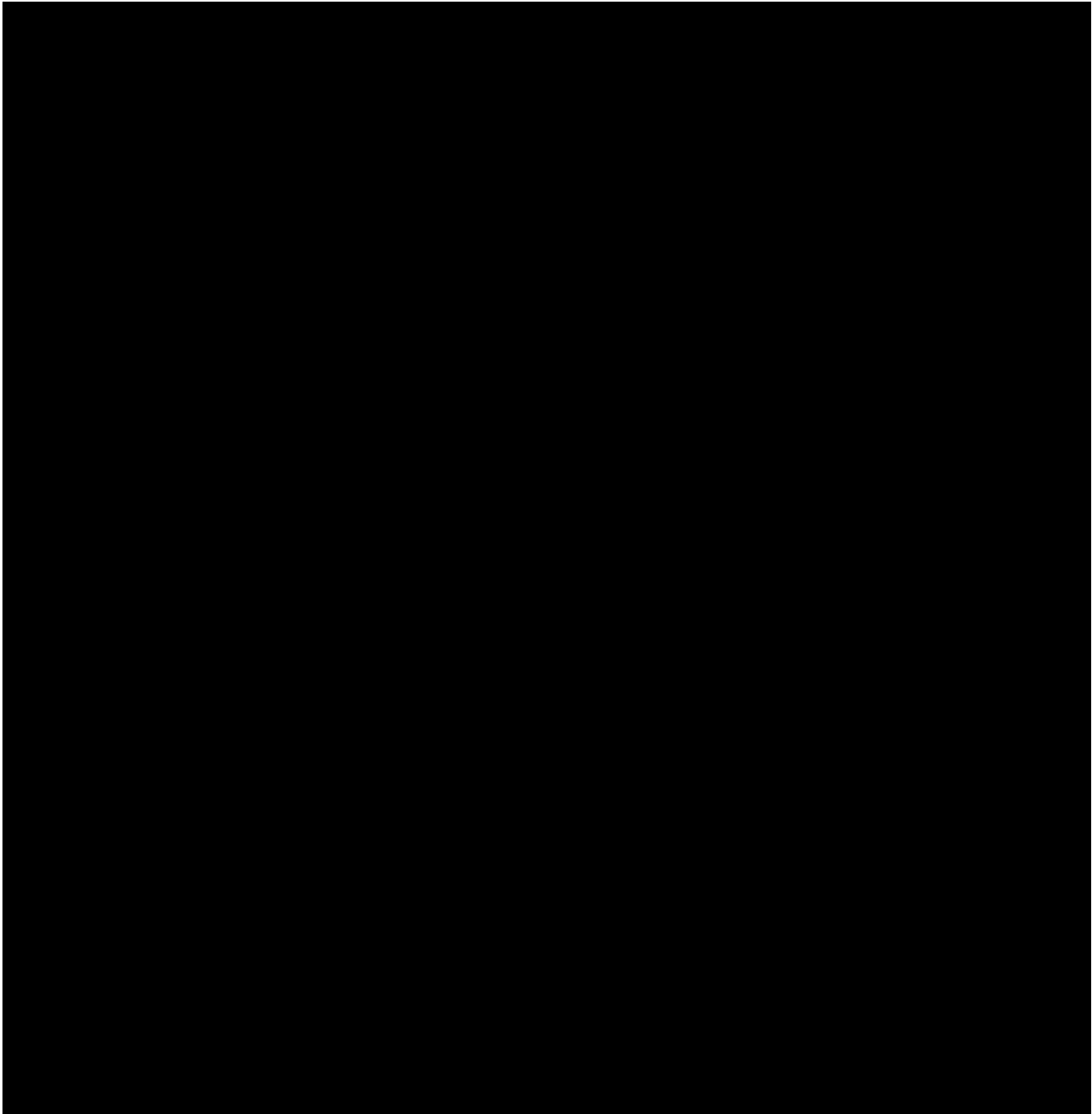


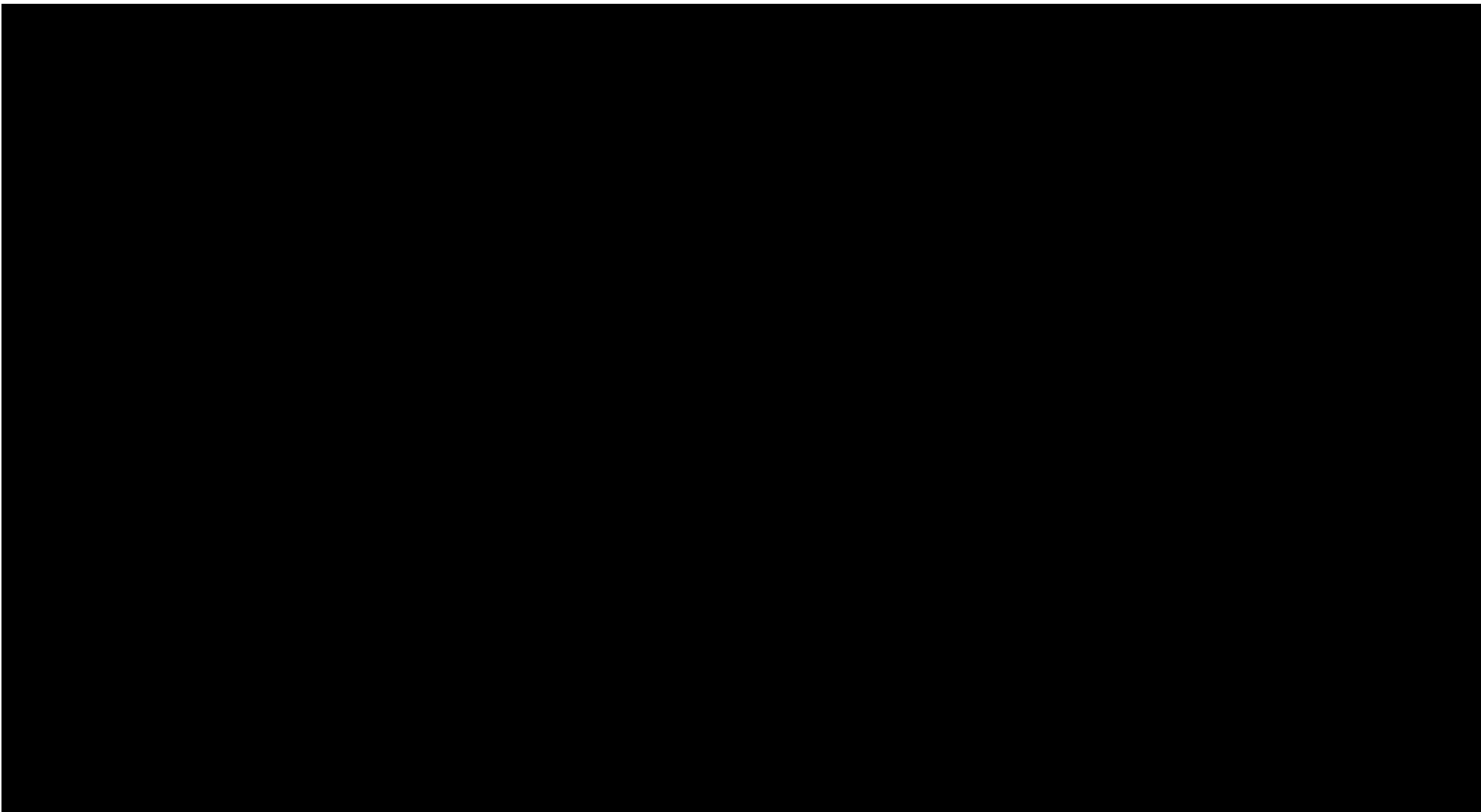


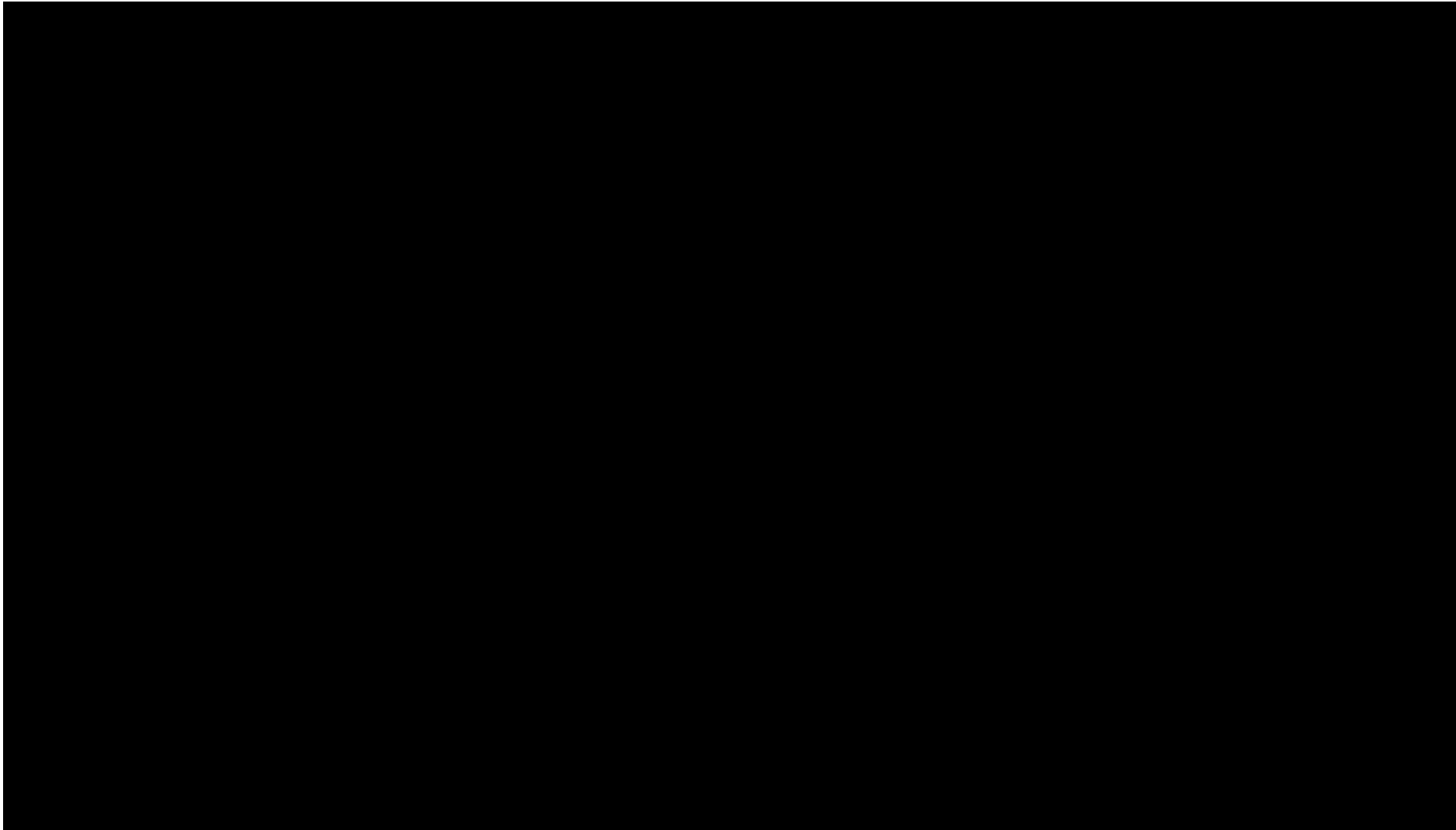
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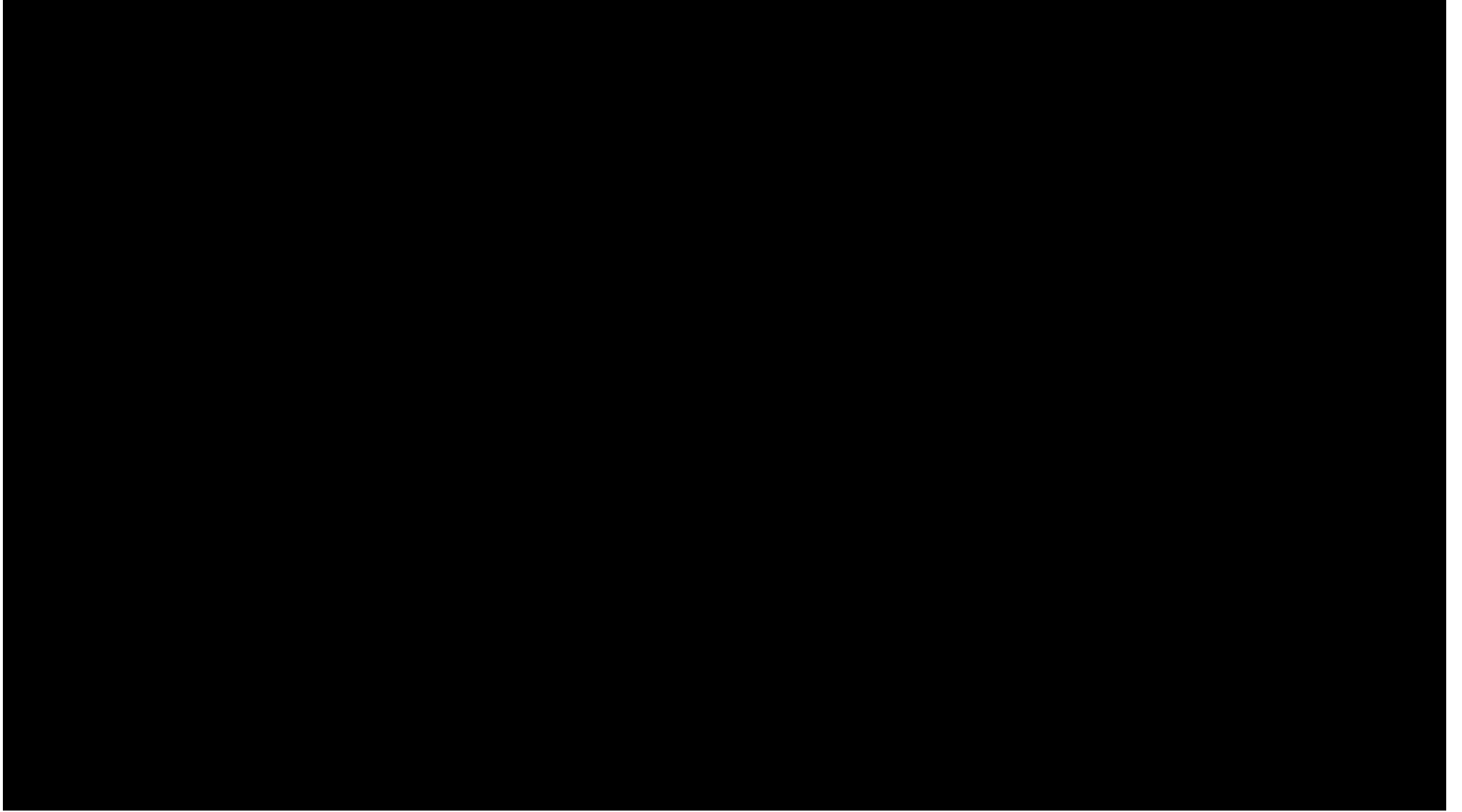
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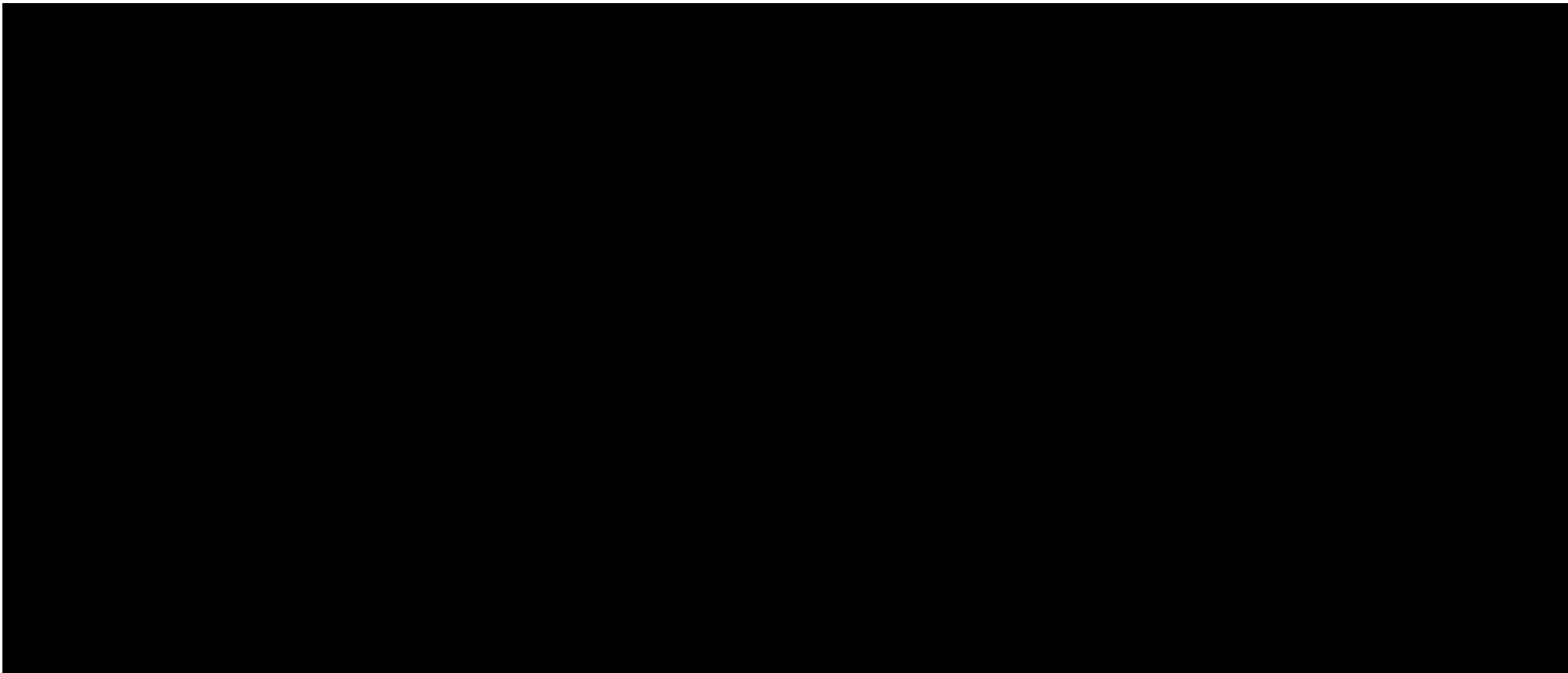
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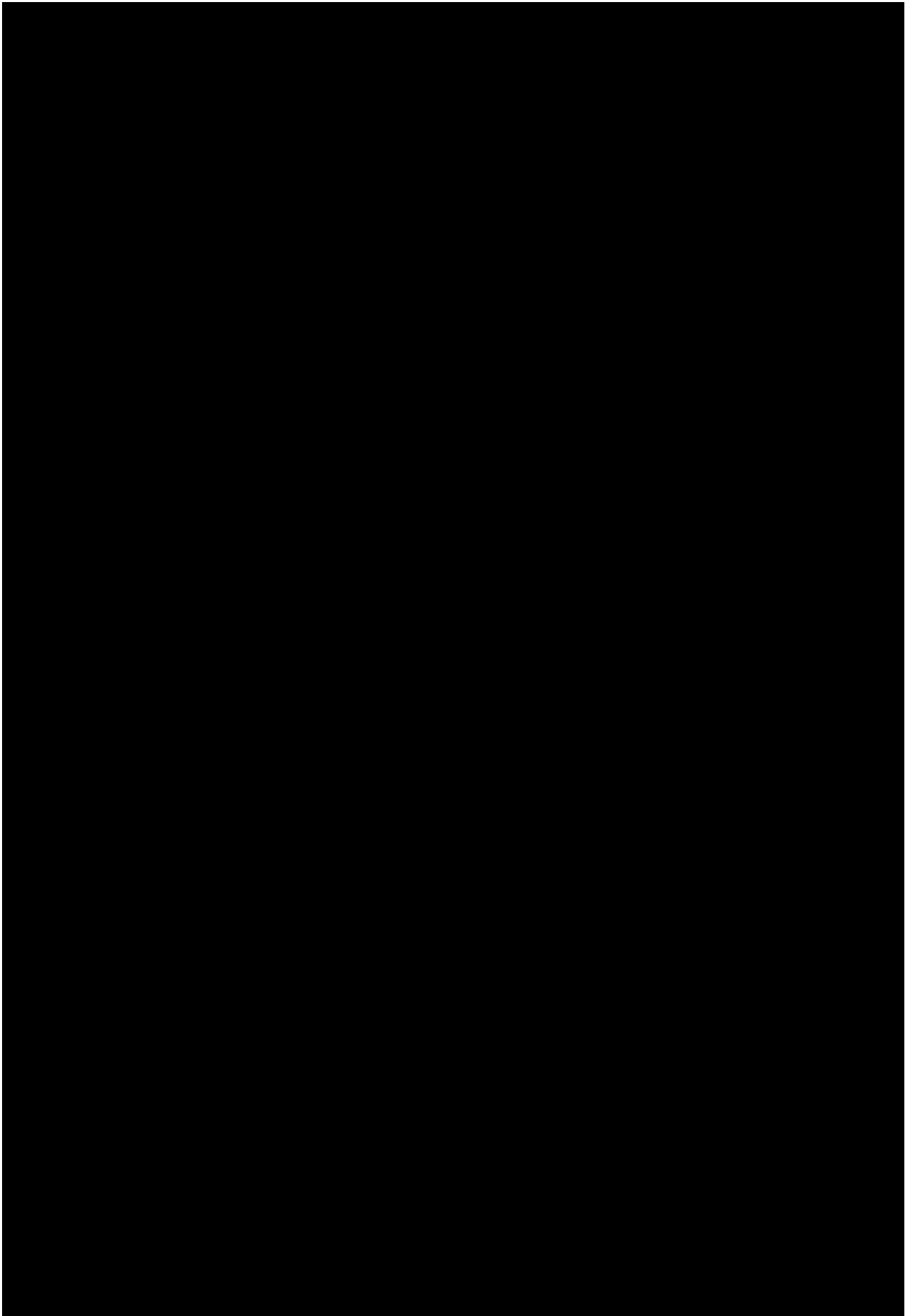


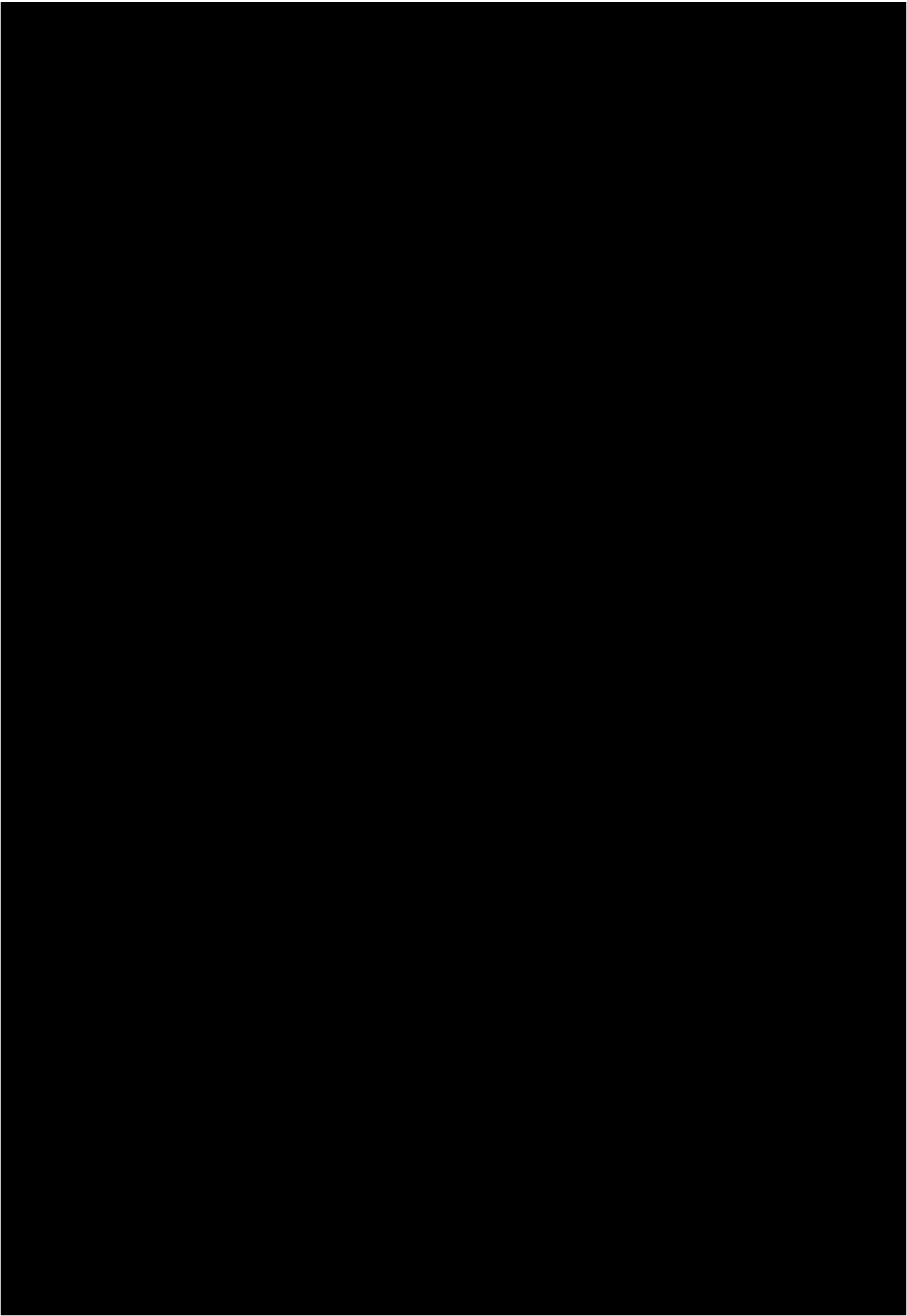


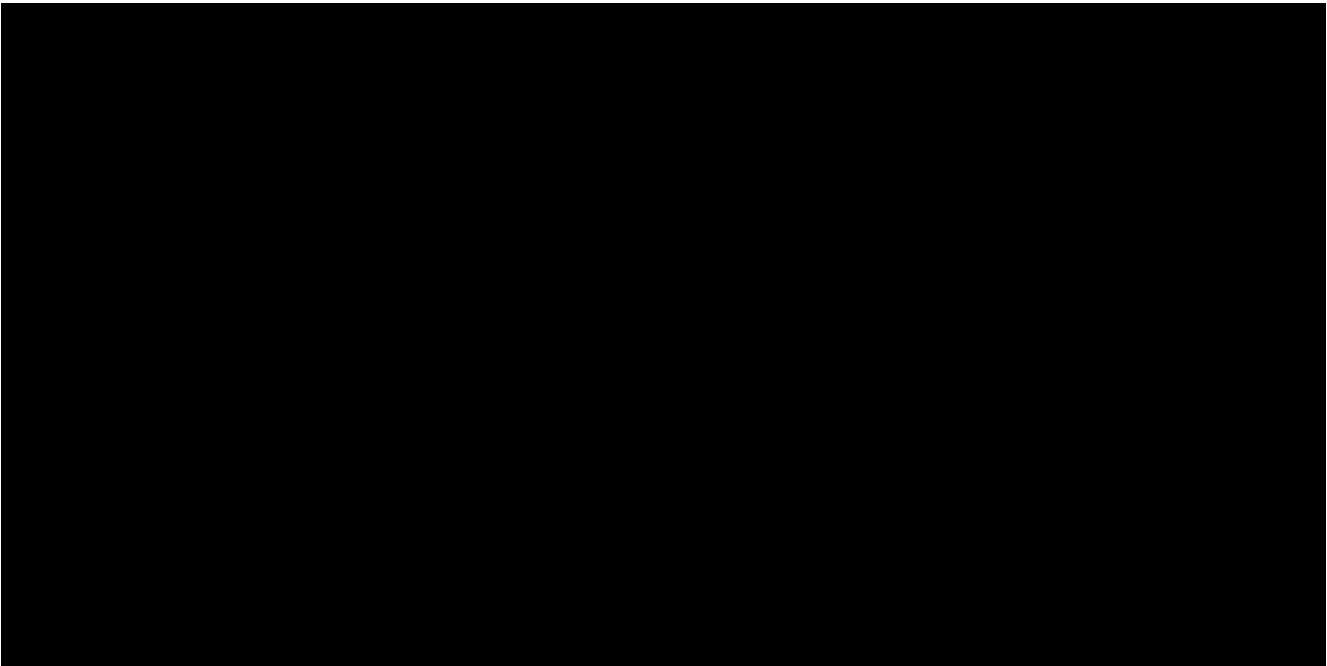


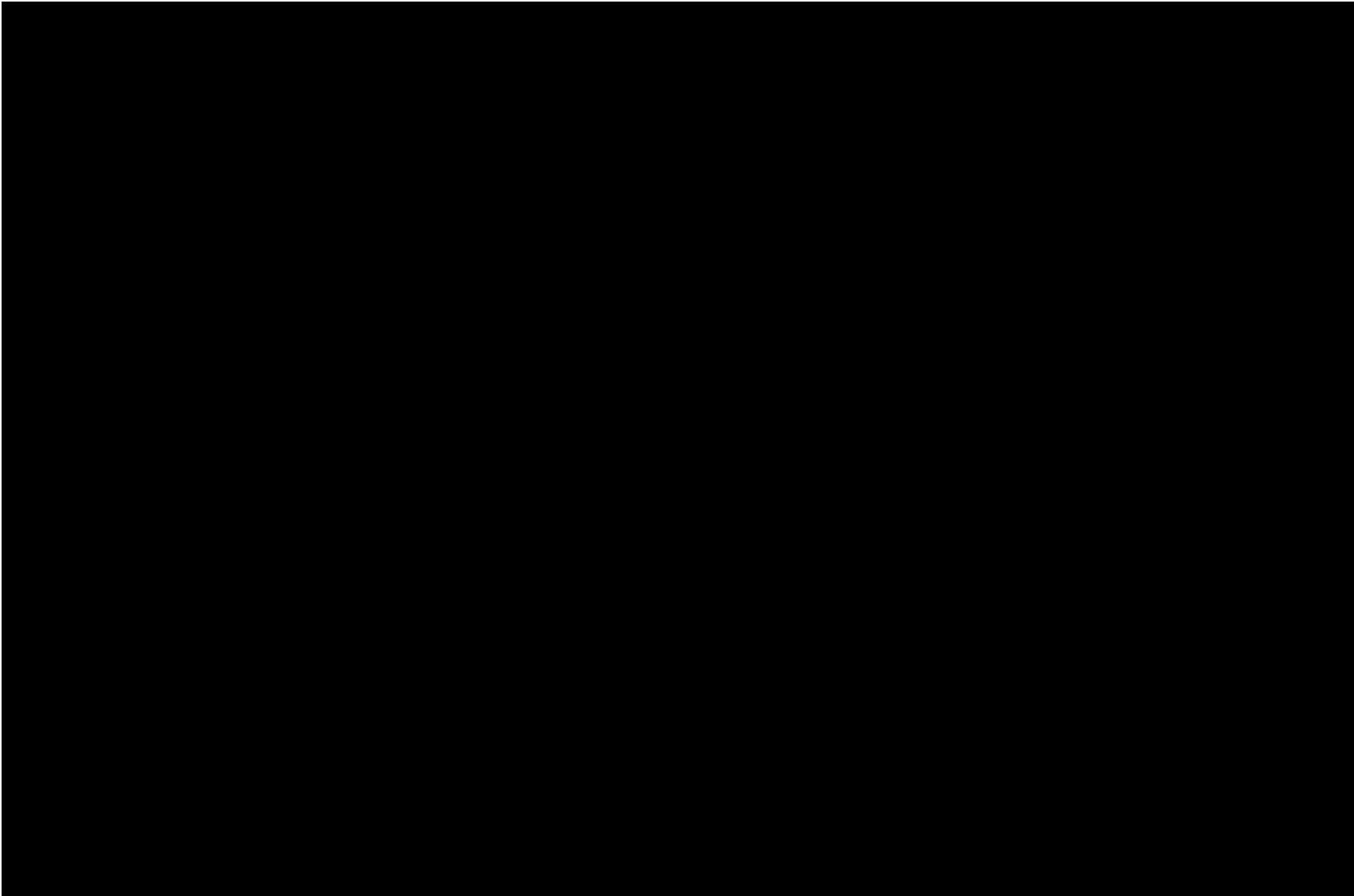


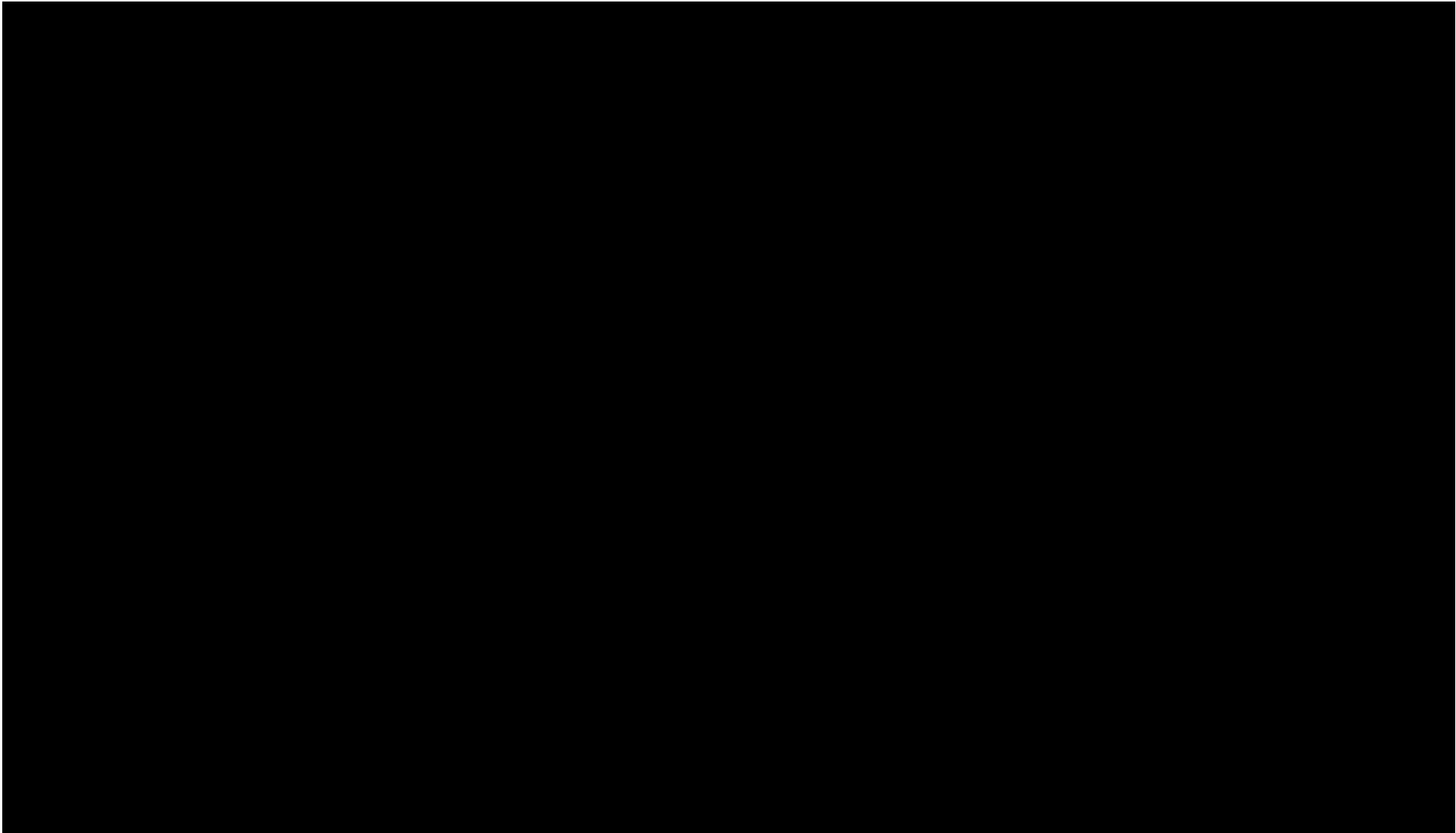


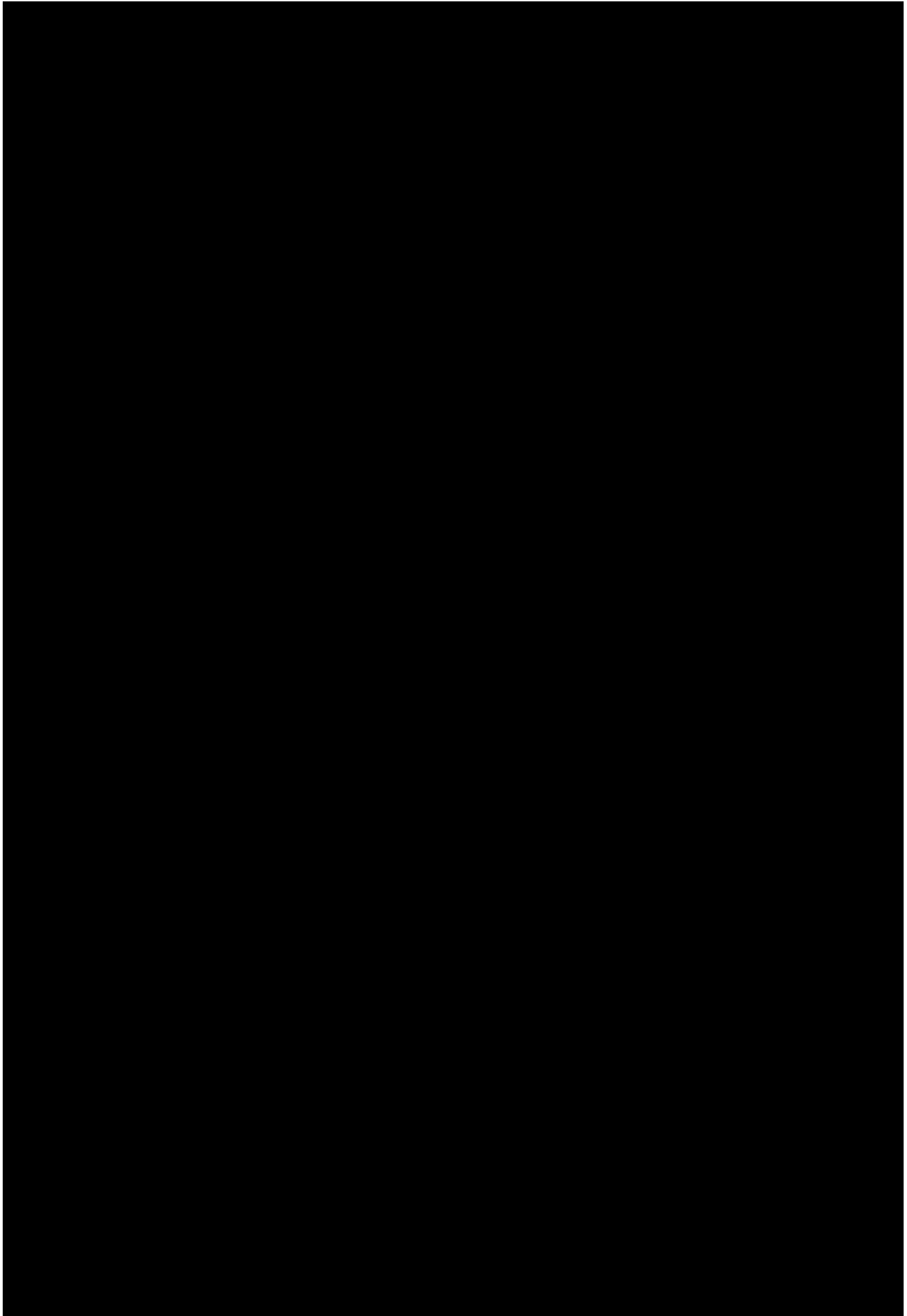


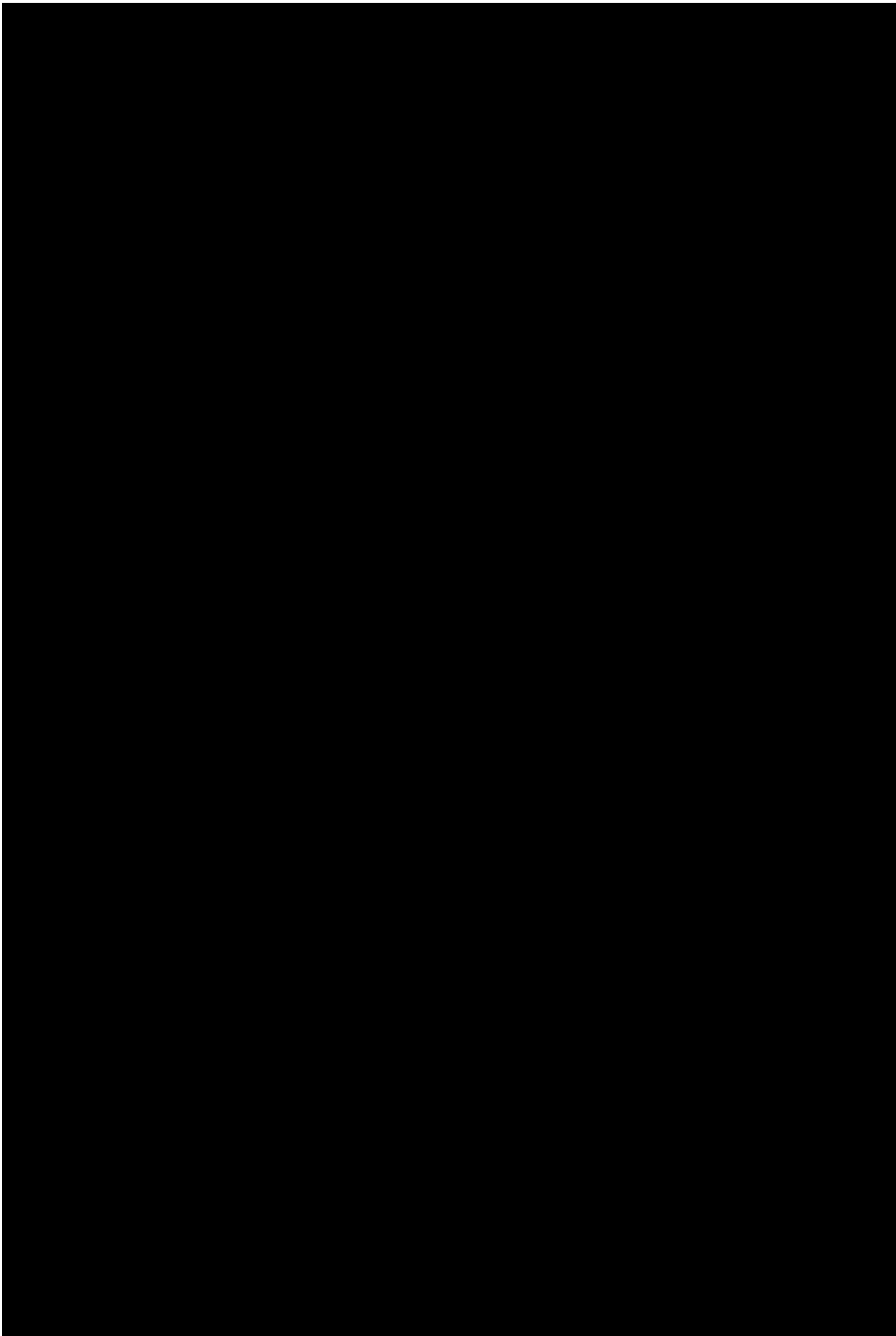


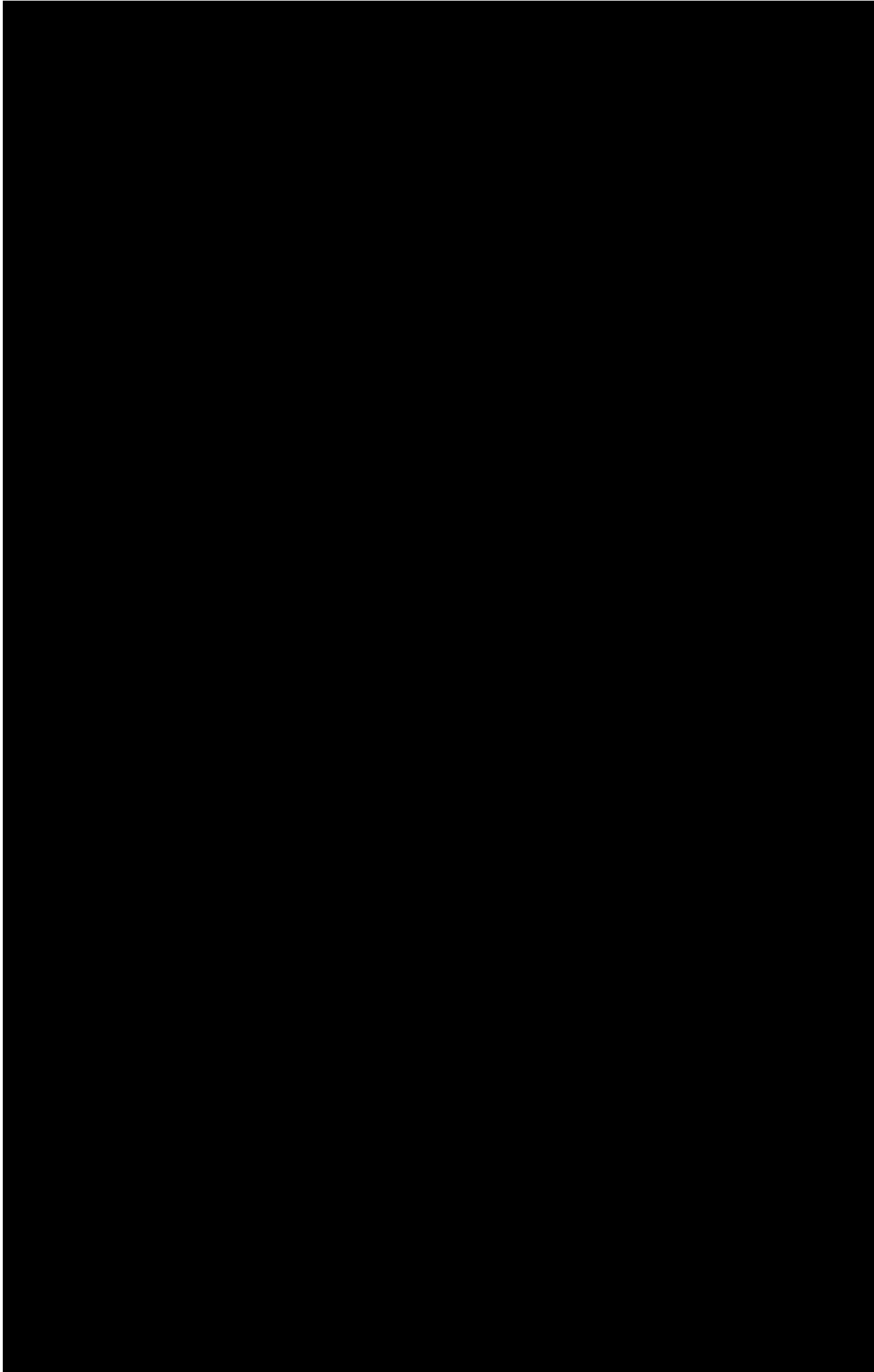


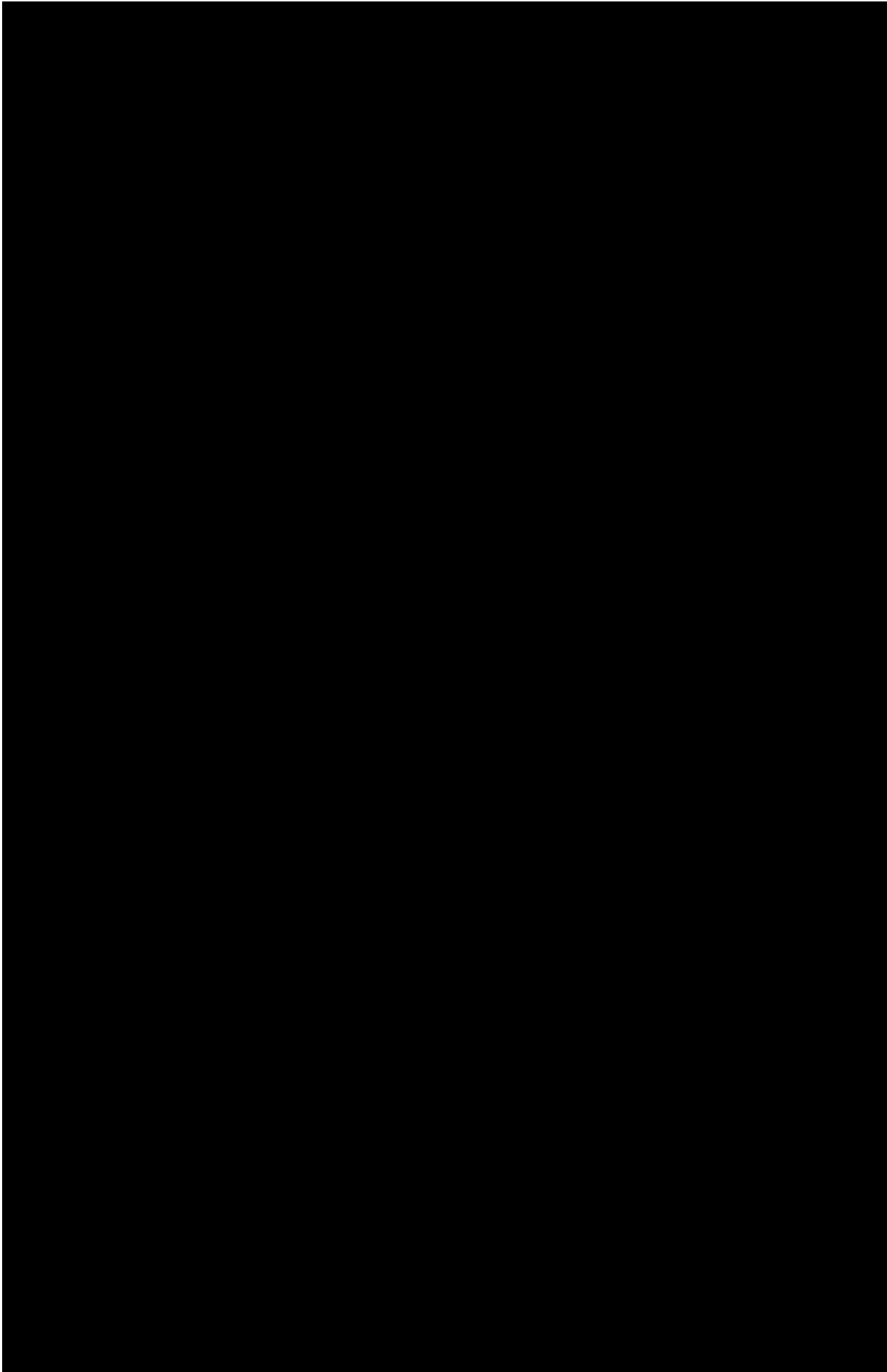


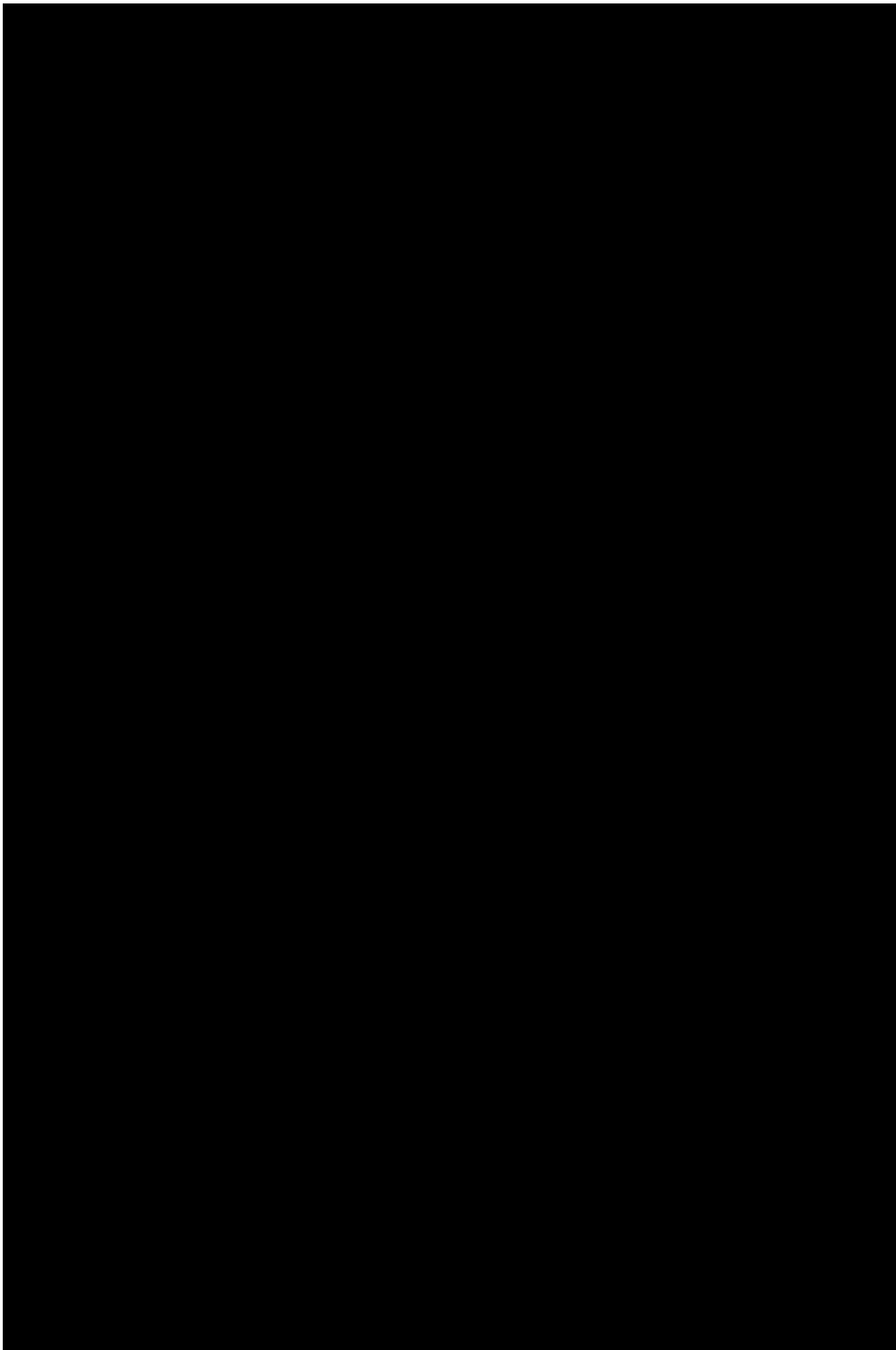


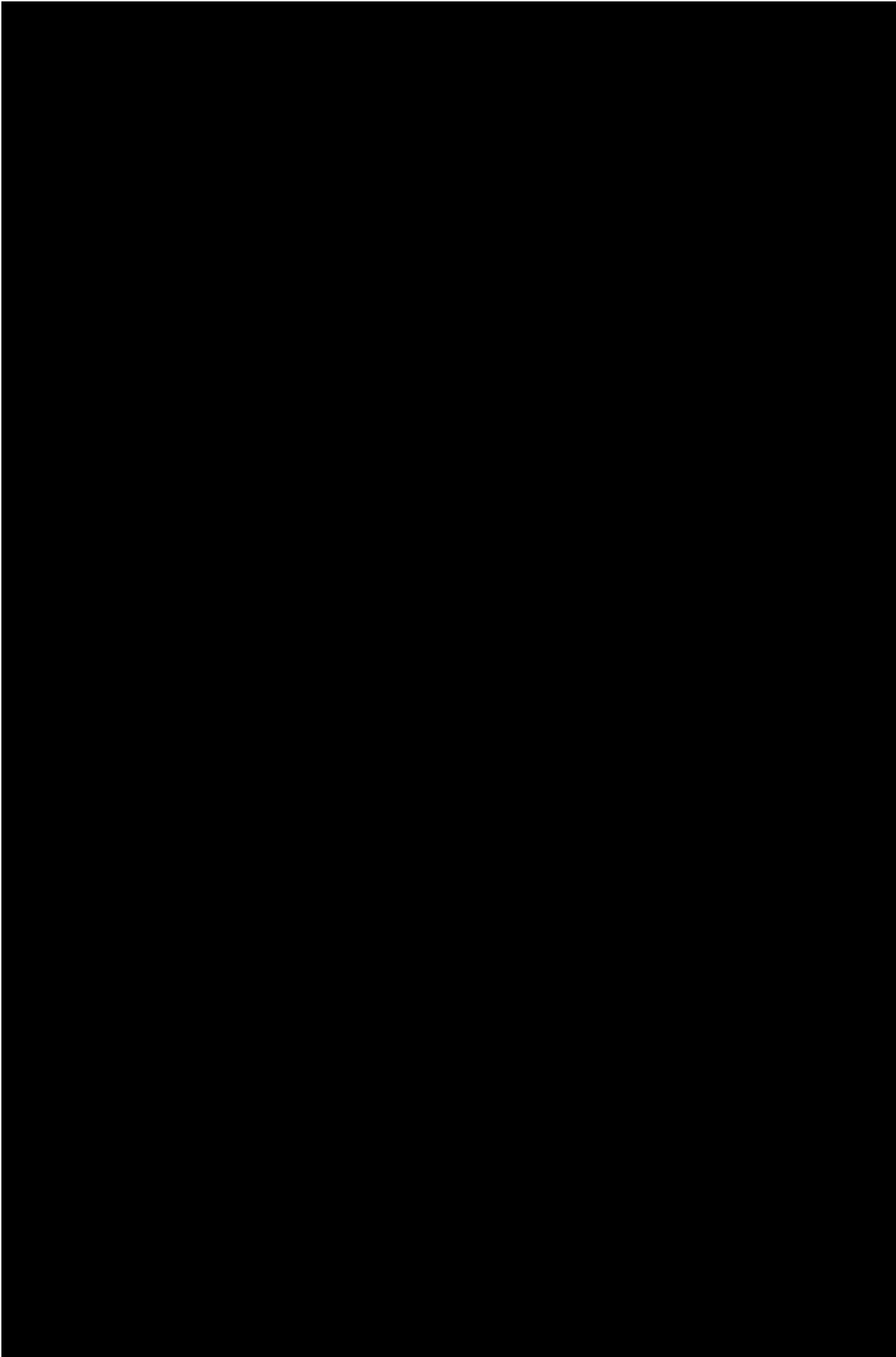


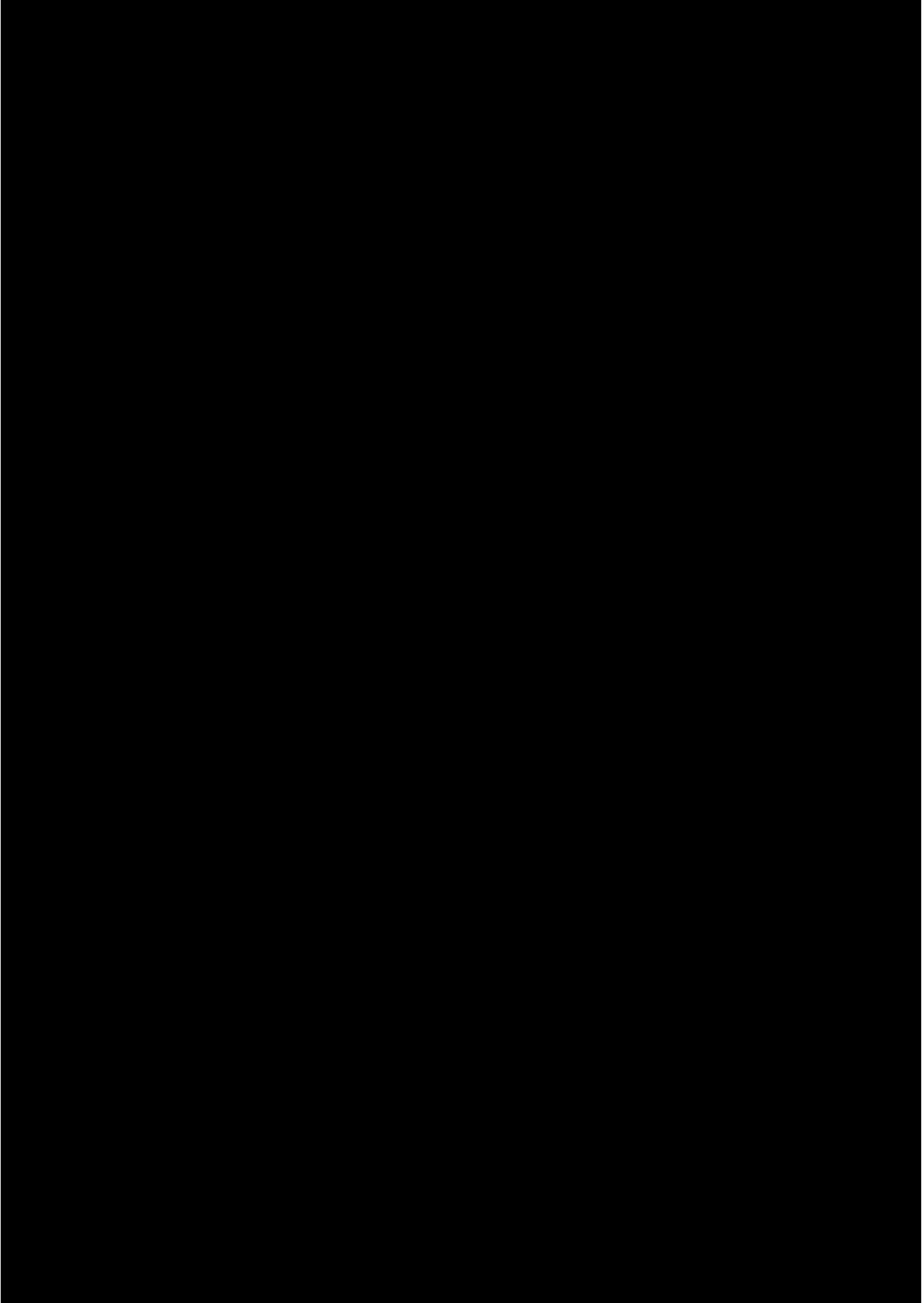












CHAPTER 3 – FINDING WEB-BASED ANXIETY INTERVENTIONS ON THE WORLD WIDE WEB: A SCOPING REVIEW

This chapter has been published as:

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Abstract

Background. One relatively new and increasingly popular approach of increasing access to treatment is web-based intervention programs. The advantage of web-based approaches is the accessibility, affordability, and anonymity of potentially evidence-based treatment. Despite much research evidence on the effectiveness of web-based interventions for anxiety found in the literature, little is known about what is publically available for potential consumers on the web.

Objective. Our aim was to explore what a consumer searching the web for web-based intervention options for anxiety-related issues might find. The objectives were to identify currently publically available web-based intervention programs for anxiety and to synthesise and review these in terms of (1) website characteristics such as credibility and accessibility; (2) intervention program characteristics such as intervention focus, design, and presentation modes; (3) therapeutic elements employed; and (4) published evidence of efficacy.

Methods. Web keyword searches were carried out on three major search engines (Google, Bing, and Yahoo—UK platforms). For each search, the first 25 hyperlinks were screened for eligible programs. Included were programs that were designed for anxiety symptoms, currently publically accessible on the web, had an online component, a structured treatment plan, and were available in English. Data were extracted for website characteristics, program characteristics, therapeutic characteristics, as well as empirical evidence. Programs were also evaluated using a 16-point rating tool.

Results. The search resulted in 34 programs that were eligible for review. A wide variety of programs for anxiety, including specific anxiety disorders, and anxiety in combination with stress, depression, or anger were identified and based predominantly on cognitive behavioural therapy techniques. The majority of websites were rated as credible, secure, and free of advertisement. The majority required users to register and/or to pay a program access fee. Half of the programs offered some form of paid therapist or professional support. Programs varied in treatment length and number of modules and employed a variety of presentation modes. Relatively few programs had published research evidence of the intervention's efficacy.

Conclusions. This review represents a snapshot of available web-based intervention programs for anxiety that could be found by consumers in March 2015. The consumer

is confronted with a diversity of programs, which makes it difficult to identify an appropriate program. Limited reports and existence of empirical evidence for efficacy make it even more challenging to identify credible and reliable programs. This highlights the need for consistent guidelines and standards on developing, providing, and evaluating web-based interventions and platforms with reliable up-to-date information for professionals and consumers about the characteristics, quality, and accessibility of web-based interventions.

Introduction

The National Comorbidity Survey Replication showed that 28.8% of people in the United States suffer from an anxiety disorder in their lifetime (Kessler, Chiu, Demler, Merikangas, & Walters, 2005). Reviews suggest that anxiety disorders are the most frequently occurring class of mental health disorders (Kessler, Ruscio, Shear, & Wittchen, 2010; Somers, Goldner, Waraich, & Hsu, 2006; Wittchen & Jacobi, 2005) and are considered chronic and disabling conditions worldwide (Baxter, Vos, Scott, Ferrari, & Whiteford, 2014). Despite effective treatments being available, anxiety disorders are still widely underdiagnosed and undertreated (Kroenke, Spitzer, Williams, Monahan, & Löwe, 2007; Wittchen & Jacobi, 2005). The adverse effects of anxiety disorders on psychological and somatic health, as well as high economic costs (Kroenke et al., 2007; Mental Health Foundation, 2014; Schonfeld et al., 1997; Somers et al., 2006) mean that treatment is a significant public health issue.

Lack of help-seeking behaviour and perceived barriers to accessing treatment contribute to underdiagnosis and undertreatment. Generally, individuals with anxiety display a tendency not to seek help for their disorder (Mechanic, 2007; Pollard, Henderson, Frank, & Margolis, 1989). Identified treatment barriers include lack of awareness of the presence of a disorder and available services, financial burden, and the stigma associated with disclosing mental health disorders (Collins, Westra, Dozois, & Burns, 2004; Mechanic, 2007).

Research has shown that many individuals use the Internet to find information or help for health-related topics (Powell & Clarke, 2014), especially for topics that they experience as difficult to talk about (Fox & Rainie, 2002; Kummervold et al., 2002). A survey demonstrated that 18% of all surveyed Internet users had searched the Internet for mental health-related information, with higher prevalence for those who had a history of mental health issues and those who at the time stated that they were experiencing psychological distress (Powell & Clarke, 2006). Similarly, nationally representative surveys from the Pew Internet and American Life Project found that 26-39% of individuals who sought web-based health information looked at mental health information (Fox & Rainie, 2000, 2002). When searching the Internet for mental health information, individuals may come across web-based interventions.

A web-based intervention has been defined as “a primarily self-guided intervention program that is executed by means of a prescriptive online program

operated through a website.” (p. 5) (Barak et al., 2009). Advantages of web-based approaches include accessibility, affordability, and anonymity of mental health interventions (Griffiths, Lindenmeyer, Powell, Lowe, & Thorogood, 2006; Mohr, Burns, Schueller, Clarke, & Klinkman, 2013). Web-based interventions can be accessed anytime and anywhere from devices such as computers, laptops, tablets, and mobile phones and large audiences and rural areas can be reached in a cost-effective manner (Griffiths & Christensen, 2007; Kaltenthaler et al., 2006; Muñoz, 2010). Web-based interventions also offer anonymity and privacy, which may attract individuals who experience difficulties with disclosing mental health disorders (Gega et al., 2004; Rüsich et al., 2005).

The efficacy of web-based mental health intervention programs is well established. Meta-analyses of web-based mental health interventions have shown that those interventions were as effective as face-to-face treatments and superior to control groups with substantial effect sizes (Andrews et al., 2010; Barak et al., 2008). With regard to anxiety disorders specifically, a meta-analysis concluded that computerised- and Internet-based cognitive behavioural therapy (CBT) for anxiety disorders had improved outcomes compared to waitlist and placebo assignments and these effects were equal to face-to-face treatment (Mureşan, Montgomery, & David, 2012; Reger & Gahm, 2009). Another meta-analytic review concluded that computer-aided psychotherapy was as effective as face-to-face therapy and that the effects did not differ across various anxiety disorders and types of delivery (Cuijpers et al., 2009). Similarly, a recent review reported moderate to large effect sizes for Internet-based CBT for a range of anxiety disorders ranging from 0.30 to 2.53 (Mewton, Smith, Rossouw, & Andrews, 2014).

Despite an extensive body of literature evaluating the effectiveness of developed web-based interventions, little research has examined the range and characteristics of publically available web-based intervention programs for individuals with mental health issues. Research has started to identify, describe, and evaluate the range and characteristics of mental health mobile phone apps (Harrison & Goozee, 2014; Shen et al., 2015) and e-therapy or e-counselling services (Heinlen & Welfel, 2003; Recupero & Rainey, 2006). However, e-therapy is different from web-based programs, as in e-therapy mental health professionals use text- or video-based formats (e.g., email, chat, Skype) for delivering therapy. There is also a clinical online directory of web-based mental health programs called Beacon available, which lists among

others, intervention program websites for phobias, generalised anxiety disorder, social anxiety disorder, and panic disorder (Beacon, 2015). However, this website is not updated very often and is clinically directed rather than a systematic review of programs that are publically available. A few publically available web-based programs were briefly discussed in a review; however, this was restricted to four programs available in Australia (FearFighter, Beating the Blues, Online Anxiety, CRUFAD) and included only a short overall description of the main program characteristics (Andrews & Titov, 2010). In addition, the programs were not identified by a systematic web search. Recently, a scoping review has identified and evaluated currently available interactive web-based interventions for depression (Renton et al., 2014). However, to our knowledge no study has conducted a similar review for web-based intervention programs for anxiety.

In summary, despite the clear advantages of web-based anxiety interventions, there is only limited systematically identified and up-to-date information available on the characteristics of publically available web-based interventions for anxiety and the quality of these services is currently unknown. This information would be helpful and important for consumers and practitioners interested in web-based interventions for anxiety, as well as researchers developing and evaluating those interventions. Therefore, this study conducted a replicable web search to identify freely available web-based anxiety intervention programs and review these in terms of (1) website characteristics such as origin, accessibility, and credibility; (2) web-based program characteristics, such as intervention focus, design, delivery, and features; (3) intervention characteristics such as the overall therapeutic approach and intervention features; as well as (4) published evidence of efficacy.

Methods

Search Strategy

Using the 3 most popular web search engines, Google, Bing, and Yahoo (eBizMBA Inc., 2015; Levene, 2010), a keyword search for web-based intervention programs for anxiety was performed in March 2015. UK versions of the search engines were used (.co.uk). Before starting the search, existing search history and cookies were deleted and future tracking and cookies were disabled in the browser. A list of the nine search term combinations used can be found in Table 3.1. Primarily simple and lay keywords were used to simulate a web search that was relatively likely to be conducted by an individual searching for web-based programs. It has been shown that most

individuals rarely consider more than the first 20 links generated by a search engine (Eysenbach, Powell, Kuss, & Sa, 2002). As featured links placed at the top and bottom were also considered, we chose to assess the first 25 links. This resulted in 675 hyperlinks being screened (3 search engines × 9 search terms × 25 hyperlinks).

Table 3.1

Search Terms Used in Google, Bing, and Yahoo

1. Internet therapy anxiety
2. Internet treatment anxiety
3. Internet cognitive behavioural therapy anxiety
4. Online therapy anxiety
5. Online treatment anxiety
6. Online cognitive behavioural therapy anxiety
7. Web therapy anxiety
8. Web treatment anxiety
9. Web cognitive behavioural therapy anxiety

Program Identification

All 675 hyperlinks were screened for eligible web-based programs for anxiety by the first author. The screening process consisted of two stages. The first stage involved screening all 675 hyperlinked websites to eliminate clearly irrelevant websites. All hyperlinks were screened and organised into one of the following three categories: websites with web-based programs, websites linking to websites with web-based programs, and websites with irrelevant content. Irrelevant content included, among others, e-counselling websites, mental health information websites, support groups/forums, online mental health screening/assessment, therapist or mental health clinic websites, scholarly articles, blogs, Facebook pages, Wikipedia, videos, and broken links.

For all websites categorised as “websites of web-based programs” and “websites linking to websites of web-based programs” duplicates were removed. All remaining websites entered the second stage of screening and were screened according to the following criteria by the first author: (1) designed for anxiety symptoms (although they did not need to be focused on anxiety only), (2) currently publically accessible on the Internet (via registration, application, GP referral), (3) online component, (4) structured treatment plan, and (5) available in English. Programs were excluded if they were (1) not publically accessible; (2) web-based counselling only (Skype, email, or instant message contact with a counsellor only, with no structured

program associated (information only); (3) purely informational (psychoeducation only); or (4) exclusively part of a research study.

Data Extraction

A data extraction form was created containing four main categories and nine subcategories. Table 3.2 provides an overview of the items in each main category and subcategories. The four main categories are based on the four specified study interests (website characteristics, program characteristics, intervention characteristics, and empirical evidence). The nine subcategories of the four main categories were established by incorporating the 12 key facets of a framework designed for evaluating and reporting Internet intervention studies (Proudfoot et al., 2011). The extraction was undertaken by the first author in March 2015. Screenshots of all programs and websites were taken in case the program changed during the rating period. To ensure that the programs could be evaluated thoroughly, all program authors were contacted to request free access.

Table 3.2

Data Extraction Categories and Subcategories

Main Categories	Sub-categories	Items
Website characteristics	Origin	Country of origin
	Accessibility	Registration (yes/no – if yes, how?)
		Log-in available on website (yes/no)
Program characteristics	Credibility	Access fee (yes/no - if yes, how much? Free trial available? Offered refund period? Length of subscription)
		Mobile phone rendering (yes/no)
	Intervention focus	Advertisements (yes/no – of yes, relevant vs. irrelevant)
		Presented contact details (yes/no)
		Specified authorship (yes/no)
Intervention design	Terms of use specified (yes/no)	
	Privacy notice specified (yes/no)	
Intervention characteristics	Intervention delivery	Target anxiety issue
	Therapeutic approach	Target audience
		Therapist support (yes/no - if yes, specify)
Empirical evidence	Intervention features	Suggested or set treatment length
		Number of modules
	Empirical evidence for program efficacy	Presentation format
		CBT; others (specify)
		Other therapeutic elements
		Worksheets (yes/no – if yes, specify format)
		Mood or symptoms monitoring (yes/no)
		Diary (yes/no)
		Forum (yes/no)
		Other features (yes/no – if yes, specify)
		Scrutinised program website for relevant information, contacted the author, and checked the Beacon directory.

Note. Beacon: Australian clinical online platform which describes different web-based self-help treatment programs (Beacon, 2015); CBT: Cognitive behavioural therapy.

Program Evaluation

Several validated and widely accepted scales are available to evaluate the methodology of published studies. However, there are currently no validated criteria available for evaluating actual web-based interventions as found on the web. Renton et al. (2014) created a program scoring system to evaluate web-based depression interventions. With permission from the authors, the scale was adapted to fit the four specified study interests. The adapted version consists of 16 yes or no close-ended questions that are outlined in Table 3.3. Consistent with the scoring system used by Renton et al. (2014), a score of 1 was awarded if the answer was yes, and a score of 0 if the answer was no or the question could not be evaluated. Scores were converted into percentages, with higher scores indicating a larger number of met criteria on the scale.

Table 3.3
Program Evaluation Criteria

Website characteristics	1. Was country of origin stated? 2. Was a unique user name or password provided to users? 3. Were the names and credentials of authors present? 4. Were contact details provided? 5. Were the Terms of Use specified? 6. Was a Privacy Notice specified? 7. Was evidence for the program provided to the user (i.e. attrition data/success rate/completion rate/# of users in the program/testimonials)?
Program characteristics	8. Were the primary focus/goals/objectives of the intervention stated? 9. Was the patient group or target mental health issue specified? 10. Was the number of modules or time to complete each module stated? 11. Was the intervention tailored to the user or was it generic for all users? 12. Did the program offer a multimedia content delivery (i.e. a combination of; text, video, graphics and audio formats)? 13. Was the program easy to navigate?
Intervention characteristics	14. Was the model of change (i.e. type of therapy utilised) defined/stated? 15. Was information on what is covered in the intervention modules provided (i.e. names or modules or a short description)?
Empirical evidence	16. Has the program been empirically validated?

Results

Program Selection

A search log outlines the number of hits per search, as well as the number of included and excluded hyperlinks (see Appendix 3.1). Most program websites were

identified when the search terms “online treatment anxiety” (Program websites: $n = 14$, websites with links to program websites: $n = 2$) and “online cognitive behavioural therapy anxiety” (program websites: $n = 12$, websites with links to program websites: $n = 4$) were entered into Google. “Web therapy anxiety” entered in Yahoo did not identify any program websites. All 675 links were assessed for inclusion. Figure 3.1 displays the flowchart for the two-stage selection process of included programs and reasons for exclusion. In total, 176 of the 675 (25.3%) assessed hyperlinks led either directly to program websites (133/675, 19.7%) or to websites containing links to program websites (43/675, 6.4%). The first stage of the screening identified 34 potentially eligible program websites that were subsequently assessed for inclusion. Of those, 19 websites and 34 programs met the inclusion criteria. For five programs, the authors did not grant access and some aspects of those programs could therefore not be evaluated (Beating the Blues, Changing States, eCentreClinic, FearFighter, Social Anxiety Institute).

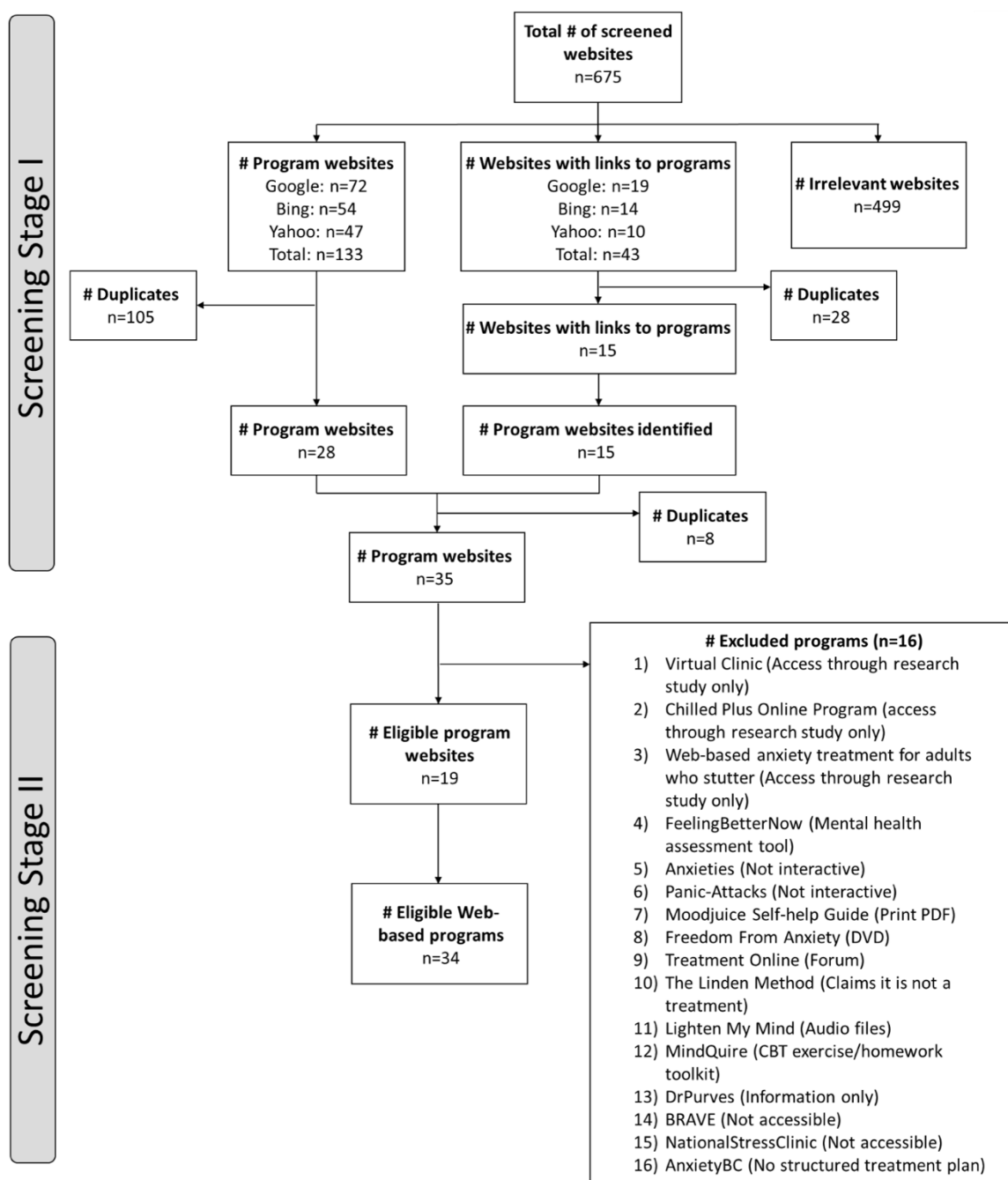


Figure 3.1. Flow diagram of program selection.

Website Characteristics

Country of origin. Programs identified in this review originated from four different countries. The majority of programs were developed in Australia (16/34, 47%), followed by the UK (9/34, 28%) and the USA (8/34, 24%), and Sweden with one program.

Accessibility. Out of the 34 programs evaluated, 25 (74%) had a compulsory online registration process to access the program, five (15%) required GP/clinician referral, one (3%) was accessible through either registration or GP referral, one (3%)

through application, and two (6%) did not require registration to access the program (see Figure 3.2). Excluding the two programs that did not require registration, 29 (85%) had a log-in feature on their website. For three programs (9%), no log-in feature was found and it was unclear how users would log in after buying the program. For programs requiring registration, consumers had to enter personal information to set up a profile. Registration allowed tracking and saving of entered information. This was not possible for programs that required no registration.

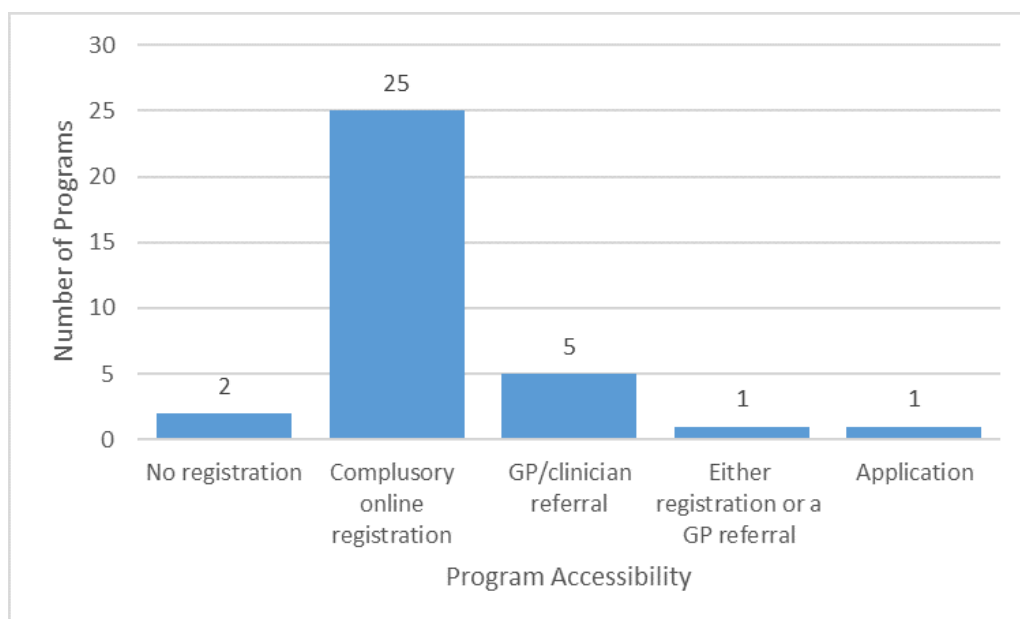


Figure 3.2. Access to evaluated programs.

Over half of programs (24/34, 71%) required an access fee, while three were free if signing up for a research trial. Costs varied from £14.99 (Changing States) for one module to £197 (FearFighter) for nine modules and therapist support. Most programs that required a fee had either a free trial period, or a 100% refund period and were either weekly/monthly subscriptions or only valid for one to six months. Out of the 34 programs, nine (28%) were accessible in a mobile phone version, while three (9%) could not be evaluated in this respect, as the authors did not grant access to the program.

Credibility. All programs specified authorship and all programs presented contact details either via a contact form and phone number (9/34, 28%), email address (7/34, 21%), email address and live chat (6/34, 18%), contact form (5/34, 15%), email address and mailing address (3/34, 9%), email address and phone number (2/34, 6%), phone number (1/34, 3%), or email address and contact form (1/34, 3%) (see Figure

3.3). Thirty out of 34 (88%) programs specified their terms of use and 32 (94%) had a privacy notice. All programs with a privacy notice also included information about browser cookies, data collection, and data management. Thirty-one programs (91%) displayed no advertisements. One program's advertisement was deemed relevant (mental health self-help books) and the other two were deemed irrelevant (BBC news link and Google Ads).

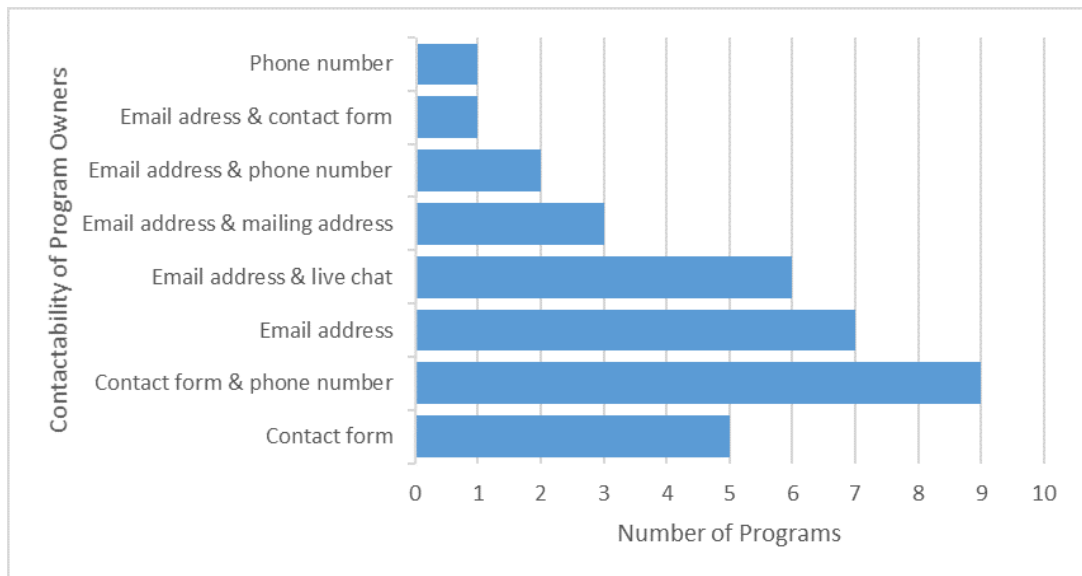


Figure 3.3. Methods of contacting the program owner.

Intervention Program Characteristics

An overview of intervention program characteristics for each program can be found in Table 3.4 and screenshots of all programs can be found in Appendix 3.2.

Table 3.4

Intervention Program Characteristics of Included Web-based Intervention Programs for Anxiety

Program (Ref#)	Target Anxiety Issue & Population	Therapist-Assisted	Structure & Length	Presentation Format	Therapeutic Approach	Intervention Features
AI-Therapy (#1)	Social anxiety	No	7 modules (1-2 modules per week)	- Text chapters with figures - Audio features with every chapter - Video features	CBT	- Online worksheets - Online questionnaires - Symptom tracking - Email reminders - Knowledge quizzes - Personalised eBook
Beating the Blues (#2)	Anxiety & depression	No	8 sessions (over 8 weeks)	- Image slides with audio & video - Interactive slides	CBT	- Worksheet printouts - Email reminders
Blues Begone (#3)	Anxiety & depression	No	30 modules (8 weeks)	- Text chapters with figures and images - Audio with every chapter - Cartoon videos	CBT	- Worksheets - Symptom tracking - Diary
Changing States - The Stress and Anxiety Manager (#4)	Anxiety & stress	No	1 module divided in 4 main sections	- Slides with images, text, accompanied by audio - Notes for printing	Hypnotherapy & CBT	- Relaxation technique audio files
CBT 7 Step Self Help Course (#5)	Anxiety, depression & anger	Option of receiving paid email guidance and personalised formulation	7 modules	- Text chapters with figures - Audio features (need to be purchased separately)	CBT	- PDF worksheet - Wiki

Table 3.4
Continued

Program (Ref#)	Target Anxiety Issue & Population	Therapist-Assisted	Structure & Length	Presentation Format	Therapeutic Approach	Intervention Features
CCBT Limited – FearFighter (#6)	Panic and phobia	Via telephone (if purchased)	9 steps (recommended 9 weeks)	- Video text and image slides	CBT	- Worksheet printouts - Progress monitoring - Emails with further tips at the end of each step
eCentreClinic - Mood Mechanic Course (#7)	Depression, social anxiety, panic attacks & generalised worry; Australian adults aged 18 to 24	Weekly contact with clinician via email and telephone (depends on trial)	4 lessons (5 weeks)	- Text chapters and images	CBT	- Online questionnaires and worksheets - Symptom tracking - Diary - Knowledge tests
eCouch - Anxiety & Worry Program (#8)	Anxiety & worry; Aged over 16	No	3 main sections (arm chair: 15 sections, tool kit, workbooks)	- Text chapters with figures and animated pictures - Audio features	CBT & IPT	- Online questionnaires and worksheets - Symptom tracking - Diary - Knowledge tests
eCouch - Social Anxiety Program (#9)	Social anxiety; Aged over 16	No	3 main sections (arm chair: 16 sections, tool kit, workbooks)	- Text chapters with figures and animated pictures - Audio features	CBT & IPT	- Online questionnaires and worksheets - Symptom tracking - Diary - Knowledge tests

Table 3.4
Continued

Program (Ref#)	Target Anxiety Issue & Population	Therapist-Assisted	Structure & Length	Presentation Format	Therapeutic Approach	Intervention Features
Learn to Live (#10)	Social anxiety	No	8 lessons (8 weeks recommended)	- Animated slides with audio, images and text - Videos - Slides require input from users	CBT	- Online and printable worksheets - Forum - Symptom tracking - Online calendar - Questionnaires
Livanda - Free from Anxiety (#11)	Panic disorder, social phobia, & general anxiety	Through messaging system within the program (if paid for)	8-10 sections (12-15 weeks)	- Text chapters and slides - Audio features	CBT	- Online worksheets - Symptom tracking
Living Life to the Full (#12)	Anxiety, stress & life skills	User can designate a support practitioner	12 modules	- Text slides with figures - Audio with every slide	CBT	- Alert emails for incomplete modules - Symptom tracking - PDF worksheets - Online books - Online questionnaires
Mental Health Online - Generalised Anxiety Disorder (#13)	Generalised anxiety disorder; Aged over 18	Weekly eTherapist emails, monitor progress, answer questions and provide support via email	12 modules (12 weeks)	- Text chapters with figures - Audio and video features	CBT	- PDF worksheets - Online worksheets - Symptom tracking - Diary

Table 3.4
Continued

Program (Ref#)	Target Anxiety Issue & Population	Therapist-Assisted	Structure & Length	Presentation Format	Therapeutic Approach	Intervention Features
Mental Health Online - Social Anxiety Disorder (#14)	Social anxiety disorder; Aged over 18	Weekly eTherapist emails, monitor progress, answer questions and provide support via email	12 modules (12 weeks)	- Text chapters with figures - Audio and video features	CBT	- PDFs worksheets - Online worksheets - Symptom tracking - Diary
Mental Health Online - Panic Disorder with or without Agoraphobia (#15)	Panic disorder with or without agoraphobia; Aged over 18	Weekly eTherapist emails, monitor progress, answer questions and provide support via email	12 modules (12 weeks)	- Text chapters with figures - Audio and video features	CBT	- PDFs worksheets - Online worksheets - Symptom tracking - Diary
Mood Control (#16)	Anxiety & depression	No	12 modules (13 weeks)	- Video for every chapter with an introduction text	CBT	- PDFs worksheets - Online questionnaires - Symptom tracking - Forum - Bonus material (sessions for personal development and life change) - Additional worksheets
MoodGym (#17)	Anxiety & depression; Aged over 16	No	5 modules	- Text chapters with images	CBT & IPT	- Quizzes - Worksheets - Downloadable relaxation audio - Symptom tracking

Table 3.4
Continued

Program (Ref#)	Target Anxiety Issue & Population	Therapist-Assisted	Structure & Length	Presentation Format	Therapeutic Approach	Intervention Features
myCompass (#18)	Anxiety, depression & stress; Aged over 18; Mobile phone function for Australian residents only	No	12 modules (6-8 weeks)	- Text chapters with figures	CBT, IPT & positive psychology	- PDF worksheets - Online worksheets - Symptom tracking - Diary - Wiki - SMS & email reminders - Real-life experience stories
Online Therapy – Anxiety (#19)	Anxiety; Aged over 18	Live support and email	8 sections (8 weeks)	- Text chapters with figures and images	CBT	- Online worksheets - Online questionnaires - Symptom tracking - Diary - Forum - Chatroom for general help
Online Therapy - Generalized Anxiety Disorder (#20)	Generalised anxiety disorder; Aged over 18	Live support and email	8 sections (8 weeks)	- Text chapters with figures and images	CBT	- Online worksheets - Online questionnaires - Symptom tracking - Diary - Forum - Chatroom for general help
Online Therapy - Panic Attacks (#21)	Panic attacks; Aged over 18	Live support and email	8 sections (8 weeks)	- Text chapters with figures and images	CBT	- Online worksheets - Online questionnaires - Symptom tracking - Diary - Forum - Chatroom for general help

Table 3.4
Continued

Program (Ref#)	Target Anxiety Issue & Population	Therapist-Assisted	Structure & Length	Presentation Format	Therapeutic Approach	Intervention Features
Online Therapy - Agoraphobia (#22)	Agoraphobia; Aged over 18	Live support and email	8 sections (8 weeks)	- Text chapters with figures and images	CBT	- Online worksheets - Online questionnaires - Symptom tracking - Diary - Forum - Chatroom for general help
Online Therapy - Social Anxiety (#23)	Social anxiety; Aged over 18	Live support and email	8 sections (8 weeks)	- Text chapters with figures and images	CBT	- Online worksheets - Online questionnaires - Symptom tracking - Diary - Forum - Chatroom for general help
Online Therapy - Speech Anxiety (#24)	Speech anxiety; Aged over 18	Live support and email	8 sections (8 weeks)	- Text chapters with figures and images	CBT	- Online worksheets - Online questionnaires - Symptom tracking - Diary - Forum - Chatroom for general help
Serenity Program - Anxiety Program (#25)	Stress, generalised anxiety disorder, social anxiety, & panic disorder; Aged over 18	No	9 modules (9 weeks)	- Text slides with figures and animated images - Interactive content on slides - Audio feature	CBT	- PDF worksheets

Table 3.4
Continued

Program (Ref#)	Target Anxiety Issue & Population	Therapist-Assisted	Structure & Length	Presentation Format	Therapeutic Approach	Intervention Features
Social Anxiety Institute (#26)	Social anxiety	No	25 modules	- Audio sessions - Video features - Hand-outs	CBT	None
This Way Up Clinic – Worry (#27)	Generalised anxiety disorder; Aged over 18	Supervised by clinician	6 modules (8 weeks)	- Comic slides	CBT	- Online questionnaires - Downloadable homework - Symptom tracking - Recovery stories - Online calendar (set up email reminders) - Downloadable extra activities and information
This Way Up Clinic -Worry and sadness (#28)	Depression & anxiety; Aged over 18	Supervised by clinician	6 modules (8 weeks)	- Comic slides	CBT	- Online questionnaires - Downloadable homework - Symptom tracking - Recovery stories - Online calendar (set up email reminders) - Downloadable extra activities and information
This Way Up Clinic - Panic (#29)	Panic/agoraphobia ; Aged over 18	Supervised by clinician	6 modules (8 weeks)	- Comic slides	CBT	- Online questionnaires - Downloadable homework - Symptom tracking - Recovery stories - Online calendar (set up email reminders) - Downloadable extra activities and information

Table 3.4
Continued

Program (Ref#)	Target Anxiety Issue & Population	Therapist-Assisted	Structure & Length	Presentation Format	Therapeutic Approach	Intervention Features
This Way Up Clinic - Shyness (#30)	Social phobia, Aged over 18	Supervised by clinician	6 modules (8 weeks)	- Comic slides	CBT	- Online questionnaires - Downloadable homework - Symptom tracking - Recovery stories - Online calendar (set up email reminders) - Downloadable extra activities and information
This Way Up Self-help – Shyness (#31)	Social phobia; Aged over 18	No	3 modules (3 weeks)	- Comic slides	CBT	- Online questionnaires - Downloadable homework - Symptom tracking - Recovery stories - Online calendar (set up email reminders) - Downloadable extra activities and information
This Way Up Self-help - Worry and Sadness (#32)	Depression & anxiety; Aged over 18	No	3 modules (3 weeks)	- Comic slides	CBT	- Online questionnaires - Downloadable homework - Symptom tracking - Recovery stories - Online calendar (set up email reminders) - Downloadable extra activities and information

Table 3.4
Continued

Program (Ref#)	Target Anxiety Issue & Population	Therapist-Assisted	Structure & Length	Presentation Format	Therapeutic Approach	Intervention Features
This Way Up School-Overcoming Social Anxiety (#33)	Social anxiety; Grade 11 and 12 high school	No	6 modules (6 weeks)	- Comic slides	CBT	- Online questionnaires - Downloadable homework - Symptom tracking - Recovery stories - Online calendar (set up email reminders) - Downloadable extra activities and information
This Way Up School-Anxiety and Depression Prevention for Adolescents (#34)	Anxiety & depression; Grade 9 to 11 high school	No	6 modules (6 weeks)	- Comic slides	CBT	- Online questionnaires - Downloadable homework - Symptom tracking - Recovery stories - Online calendar (set up email reminders) - Downloadable extra activities and information

Note. CBT: Cognitive behavioural therapy; IPT: Interpersonal Therapy.

Intervention focus. Programs were designed for a range of issues including specific anxiety disorders; anxiety combined with depression and stress, or anger; various anxiety disorders combined; or anxiety in general. Figure 3.4 shows that the majority of programs were designed for social anxiety/phobia (9/34, 28%) or for mixed anxiety and depression (8/34, 24%). The remaining programs focused on anxiety in general (1/34, 3%); multiple anxiety disorders combined (3/34, 3%); anxiety mixed with stress (2/34, 6%); anxiety mixed with depression and stress or anger (2/34, 6%); or other specific anxiety disorders such as generalised anxiety disorder (3/34, 9%), panic attacks with or without agoraphobia (4/34, 12%), agoraphobia (1/34, 3%), and speech anxiety (1/34, 3%). Concerning the target audience, the majority of programs were designed for an adult population (aged over 16 or 18 years) (20/34, 59%), two were targeted at teenagers of high school age, one specifically for young adults aged 18-24 years, and 11 programs (32%) did not specify an age group, but based on content seemed to be designed for adults.

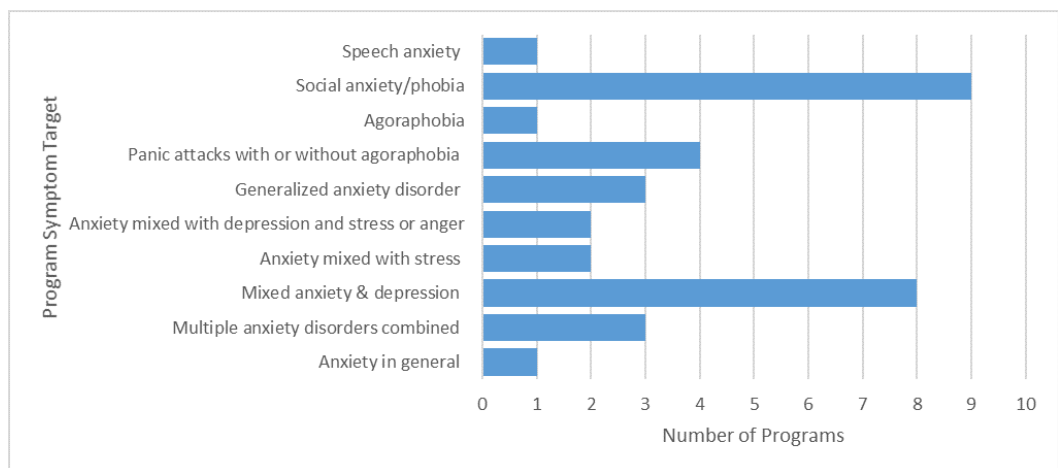


Figure 3.4. Intervention target of evaluated programs.

Intervention design. In total, 17 programs (50%) offered therapist support, either by email, instant messaging, or phone. See Figure 3.5 for a summary of the different forms of therapist support. Therapist support always required a fee; for the majority of these support programs (10/17, 59%), there was an option of paying only for the self-guided version or paying extra for support. For one free program (Living Life to the Full), consumers could invite a professional to access their account and provide support within the program (support practitioner). The recommended length of the programs varied from one to 15 weeks ($M = 8.85$ weeks, $SD = 4.10$) and the number of modules offered ranged from one to 30 ($M = 9.38$, $SD = 5.97$).

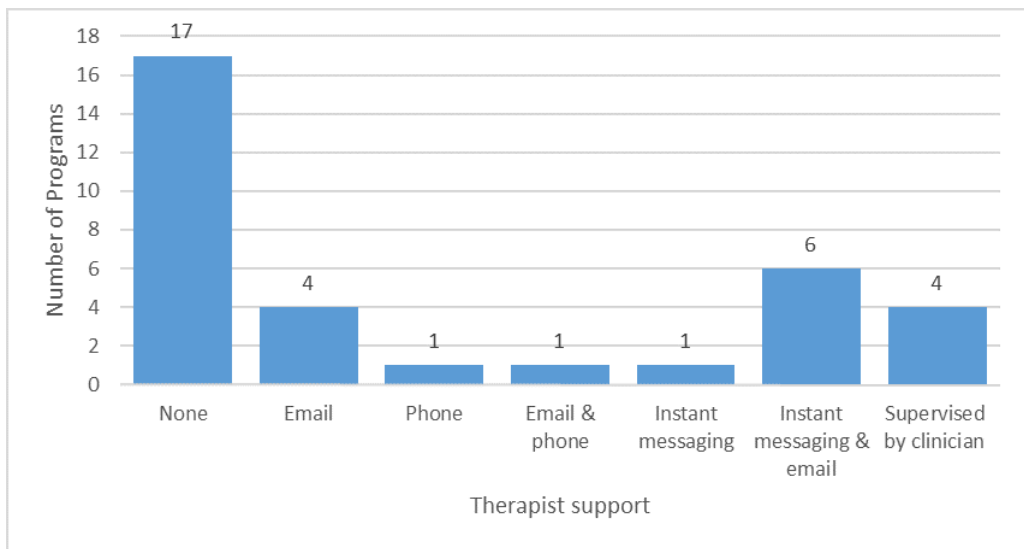


Figure 3.5. Therapist support offered in evaluated programs.

Modes of therapy presentation. All programs used a combination of different modes of presentation (e.g., text, images, audio, video, text entry-fields, and animation). Content was most frequently presented as text chapters with images or diagrams (23/34; 68%). Other identified modes of presentation included animated slides or pictures, comic slides, ebooks, and video sessions. In total, 15 programs (44%) incorporated audio components and nine included video components (26%).

General therapeutic approach. All 34 programs claimed to be CBT-based and at least one cognitive and behavioural therapeutic element was employed for each program based on the examined module content. Some programs stated that they also incorporated other therapeutic approaches, such as interpersonal therapy (4/34, 13%), hypnotherapy (1/34, 3%), and positive psychology (1/34, 3%) (see Figure 3.6).

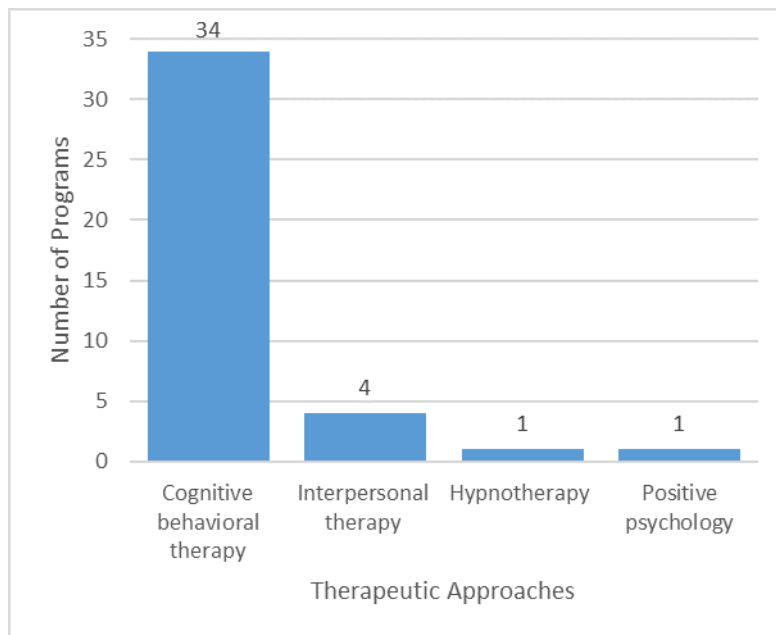


Figure 3.6. Therapeutic approaches used in evaluated programs.

Other therapeutic elements. Other popular therapeutic elements included psychoeducation modules, goal-setting features, features to create case conceptualisations for oneself, skills training exercises, various forms of relaxation exercises, mindfulness-based exercises, experience stories, sleep hygiene, and relapse prevention.

Intervention features. All except for one program (33/34, 97%) provided the user with worksheets during the session or homework in PDF or online forms. Mood or symptom monitoring/tracking was part of the majority of programs (29/34, 85%). Most programs allowed the user to see results and access a result history either in a numerical or diagram format. In total, 12/34 programs (35%) offered an online diary and 9/34 programs (27%) incorporated a user forum. The review also revealed a great variety of other program features. One feature was the set-up of email or text message reminders for unfinished or future sessions (AI-Therapy, Beating the Blues, Living Life to the Full, myCompass) and an online treatment calendar to schedule the next session and set up alerts (Learn to Live, This Way Up programs). Other features included bonus material (e.g., personal development offered in Mood Control), additional resources (i.e., more worksheets to be used between sessions or after the end of treatment, offered in Mood Control, This Way Up), treatment items voted most useful by users, to-do-list maker, personal note section, awards, commitment checks (Blues Begone), knowledge

tests at the beginning and information about medication (AI-Therapy, e-couch), personalised eBooks (AI-Therapy), printable session recap and homework cards in wallet format (Mental Health Online), and a teammate function, which allowed the nomination of friends or family members for optional support (Learn to Live).

Empirical Evidence for Program Efficacy

A summary of the types of published research evaluations for each program and the respective references can be found in Table 3.5. For 3/34 programs (9%) indirect research evidence was identified. The two e-couch programs are based on the MoodGYM program, for which research evidence is available; however, the e-couch program's efficacy was not specifically empirically evaluated. The AI-Therapy program has only been evaluated for social anxiety in adults who stutter using a pre-post study without a control group. For 17/34 programs (50%), empirical studies evaluating efficacy or effectiveness were found. Studies ranged from case series and small to mid-sized pre-post interventions without comparison groups to controlled and RCTs. Both MoodGYM and This Way Up have been evaluated through nine RCTs each. The efficacy of Beating the Blues was demonstrated by two RCTs, FearFighter by two RCTs, and myCompass by one RCT. For 14/34 programs (41%), no research evidence of the efficacy or effectiveness of the intervention was found.

Table 3.5

Type of Research Evaluation of Included Web-based Interventions

Program (Ref#)	Type of research evaluation studies
AI-Therapy (#1)	<ul style="list-style-type: none"> - Pre-post intervention for social anxiety in stuttering. (Helgadóttir, Menzies, Onslow, Packman, & O'Brian, 2014) - Case study (Helgadóttir, Menzies, Onslow, Packman, & O'Brian, 2009)
Beating the Blues (#2)	<ul style="list-style-type: none"> - Feasibility & acceptability (Proudfoot et al., 2003) - 2 RCTs (Proudfoot et al., 2003, 2004) - Cost-effectiveness (McCrone et al., 2004) - Pre- post intervention without comparison group (Cavanagh et al., 2006; Mitchell & Dunn, 2007) - Implementation (Fox, Acton, Wilding, & Corcoran, 2004; Learmonth & Rai, 2008; Van Den Berg, Shapiro, Bickerstaffe, & Cavanagh, 2004)
Blues Begone (#3)	<ul style="list-style-type: none"> - Pre-post intervention without comparison group (Purves, Bennett, & Wellman, 2009)
Changing States - The Stress and Anxiety Manager (#4)	Website: not specified; Beacon: no research evidence
CBT 7 Step Self Help Course (#5)	Website: not specified; Beacon: not reviewed
CCBT Limited – FearFighter (#6)	<ul style="list-style-type: none"> - Acceptability study (MacGregor, Hayward, Peck, & Wilkes, 2009) - Pre-post intervention pilot (Kenwright, Marks, Gega, & Mataix-Cols, 2004) - Case studies without comparison group (Gega et al., 2004) - Implementation study (Hayward et al., 2007) - 2 RCTs (Marks, Kenwright, McDonough, Whittaker, & Mataix-Cols, 2004; Schneider, Mataix-Cols, Marks, & Bachofen, 2005)
eCentreClinic - Mood Mechanic Course (#7)	Website: nothing for this specific program; Beacon: not reviewed
eCouch - Anxiety & Worry Program (#8, #9)	Adapted from MoodGYM
Learn to Live (#10)	Website: not specified; Beacon: not reviewed
Livanda - Free from Anxiety (#11)	Website: not specified; Beacon: no research evidence
Living Life to the Full (#12)	Website: not specified; Beacon: no research evidence

Table 3.5

Continued

Program (Ref#)	Type of research evaluation studies
Mental Health Online - Generalised Anxiety Disorder (#13, #14, #15)	<ul style="list-style-type: none"> - Participant choice trial (Klein, Meyer, Austin, & Kyrios, 2011) - Implementation (AL-Asadi, Klein, & Meyer, 2014a) - Predictors of pre-treatment attrition and treatment withdrawal (AL-Asadi, Klein, & Meyer, 2014b)
Mood Control (#16)	Website: not specified; Beacon: no research evidence
MoodGym (#17)	<ul style="list-style-type: none"> - Nine RCTs (Calear, Christensen, Mackinnon, Griffiths, & O’Kearney, 2009; Christensen, Griffiths, Mackinnon, & Brittliffe, 2006; Christensen, Griffiths, & Jorm, 2004; Ellis, Campbell, Sethi, & O’Dea, 2011; Farrer, Christensen, Griffiths, & Mackinnon, 2011; Griffiths, Christensen, Jorm, Evans, & Groves, 2004; Hickie et al., 2010; Lintvedt et al., 2013; Sethi, Campbell, & Ellis, 2010) - School and class-based trials (O’Kearney, Gibson, Christensen, & Griffiths, 2006; O’Kearney, Kang, Christensen, & Griffiths, 2009) - Implementation (Christensen, Griffiths, Korten, Brittliffe, & Groves, 2004) - Program usage analysis (Christensen, Griffiths, & Korten, 2002) - Follow-up outcome analysis (Mackinnon, Griffiths, & Christensen, 2008) Compliance of community users and predictor of outcomes analysis (Christensen et al., 2006)
myCompass (#18)	- RCT (Clarke et al., 2014; Proudfoot et al., 2013)
Online Therapy (#19, #20, #21, #22, #23, #24)	Website: not specified; Beacon: not reviewed
Serenity Program - Anxiety Program (#25)	- Pilot pre-post treatment without comparison group (Slegg, Cottrell, Nicholas, & Messenger, 2009)
Social Anxiety Institute (#26)	Website: not specified; Beacon: not reviewed
This Way Up Clinic (#27, #28, #29, #30)	Generalised anxiety disorder:
This Way Up Self-help (#31, #32)	<ul style="list-style-type: none"> - 3 RCTs (Robinson et al., 2010; Titov, Andrews, Robinson, et al., 2009; Titov, Andrews, Johnston, Robinson, & Spence, 2010) - Implementation study (Mewton, Wong, & Andrews, 2012)

Table 3.5

Continued

Program (Ref#)	Type of research evaluation studies
This Way Up School (#33, #34)	Panic:
Anxiety:	- 1 RCT (Wims, Titov, Andrews, & Choi, 2010)
	- Pre-post intervention trial without comparison group (Wims, Titov, & Andrews, 2008)
	Social phobia:
	- 5 RCTs (Titov, Andrews, Schwencke, et al., 2009; Titov, Andrews, Schwencke, Drobny, & Einstein, 2008; Titov, Andrews, Choi, Schwencke, & Johnston, 2009; Titov, Andrews, Choi, Schwencke, & Mahoney, 2008; Titov, Andrews, & Schwencke, 2008)
	- Implementation study (Aydos, Titov, & Andrews, 2009)
	- Cost-effectiveness, acceptability, and follow-up analysis (Titov, Andrews, Johnston, Schwencke, & Choi, 2009)
<i>Note.</i> Beacon: Australian clinical online platform which describes different web-based self-help treatment programs (Beacon, 2015); RCT: Randomised controlled trial.	

Results were examined for programs for which anxiety symptoms were evaluated in RCTs. Beating the Blues was found to lead to a significant reduction of anxiety both at the end of treatment and at 6 months' follow-up compared to treatment as usual (Proudfoot et al., 2003). For FearFighter, both the face-to-face and online program group had reduced anxiety at post-treatment and 1-month follow-up (Marks et al., 2004). MoodGym was evaluated in adolescents and university students and levels of anxiety were found to be lower in the intervention group compared to the waitlist control group after the intervention (Calear et al., 2009; Ellis et al., 2011). In addition, combined face-to-face and online CBT was more effective in treating anxiety symptoms than either face-to-face or online as a standalone (Sethi et al., 2010). Compared to control subjects, participants in the myCompass intervention had reduced anxiety symptoms after the program and symptom scores remained at near normal levels at 3-month follow-up (Proudfoot et al., 2013). For This Way Up, a program targeted at generalised anxiety disorder, the intervention group participants showed significantly reduced symptoms of panic (Titov, Andrews, Robinson, et al., 2009) and anxiety (Titov et al., 2010) at post-treatment compared to the control group. Symptom reduction was the same for technician and clinician-assisted versions of the treatment (Robinson et al., 2010).

Program Evaluation

Program evaluation scores for each program and each evaluation criteria can be found in Appendix 3.3. Scores for each program ranged from 69% (CBT 7 Step Self Help Course) to 100% (AI-Therapy) with an average score of 81% ($SD = 7\%$). Concerning the evaluation criteria, all program websites specified for which patient group or symptoms the program was designed, defined or stated the utilised model of change, presented program author names and credentials, and provided contact details. About half of the program websites had been empirically evaluated (19/34, 55.9%), specified which information was covered in the intervention modules (18/34, 52.9%), and provided evidence for the program to the user (e.g., attrition data, success rate, completion rate, number of users in the program, testimonials) (14/34, 41.2%). Only 4 program websites (11.8%) specified whether the intervention was tailored to the user or generic for all users. This question could not be evaluated for one website (Social Anxiety Institute).

Discussion

Principal Findings

To our knowledge, this is the first review of publically available web-based programs for anxiety that showcases what individuals seeking such treatment options might find if they search the web. The review aimed at providing consumers, practitioners, and researchers with a summary of the availability, characteristics, and efficacy of currently freely available web-based interventions for anxiety. The review identified a wide variety of programs for anxiety, specific anxiety disorders, or anxiety in combination with stress, depression, or anger with treatments based predominantly on CBT techniques. The majority of websites were found to be credible and accessible. Of the programs reviewed, the majority required that users register and/or pay a program access fee. Half of the programs offered some form of paid therapist or professional support. Programs varied in treatment length and number of modules and employed a variety of presentation modes. Relatively few were evaluated in terms of efficacy. In particular, this review highlights two key issues: the large number and diversity of program formats and the lack of empirical evidence of efficacy for many of the identified programs. These will be discussed in more detail and results will be compared with a similar review of web-based depression programs available on the web (Renton et al., 2014).

First, the great variety and large number of identified programs for anxiety is noteworthy. Programs differed in their level of support, accessibility, and presentation. A similarly great variability among identified programs was also found for web-based depression interventions (Renton et al., 2014). Concerning accessibility, more than half of the programs required an access fee. Considering the high costs and waiting times for psychotherapy in many countries, paid web-based programs may provide an affordable alternative. However, programs often could only be purchased for a limited period. Many users may not be able to finish the program in the allotted time, and being able to receive treatment at one's own pace might be an important reason for choosing web-based treatment over face-to-face therapy.

Overall, most programs used a multimedia presentation for the intervention delivery. With the current rapid pace of advances in technology, more engaging ways of translating therapeutic techniques into interactive techniques could be created for web-based interventions to distinguish them from traditional self-help material. Increased engagement through interactivity may increase adherence and effectiveness (Doherty, Coyle, & Sharry, 2012; Ritterband et al., 2006), especially when considering reports of low utilisation and high dropout rates of web-based interventions (Christensen, Griffiths, & Farrer, 2009; Mohr, Burns, Schueller, Clarke, & Klinkman, 2013). As individuals may differ in their preferred style of therapy and time and resources available for treatment, trying different programs and considering the access period is recommended before choosing a program.

The number of identified anxiety programs was similar to the number listed in the Beacon directory (Beacon, 2015). In total, 33 distinct programs were found in the directory. About half of those programs were also identified by this review and some of those identified in this review were not listed on Beacon. It is important to note here that the Beacon website is not updated very often; for example, some reviews of anxiety programs were last updated in 2009. The difference may also be a result of the keywords used and the way search engines are designed and work. Search engines are often referred to as "information gatekeepers," as they are able to include and exclude websites and influence the ranking of websites in the search results (Levene, 2010). These results suggest that even though a multitude of web-based programs exists, it may be difficult for interested consumers to identify and compare all options. Having specialised services like the Beacon directory and keeping them up-to-date is therefore important to provide consumers with knowledge about program differences, credibility,

and effectiveness. This will in turn help consumers to be able to compare programs and choose the one most suitable for them. A review of web-based depression interventions identified a similar number ($n = 32$) of programs on the web and 12 of those programs were also included in this review (Renton et al., 2014). Those were mostly programs that offered interventions targeting both anxiety and depression issues.

To ensure that consumers access programs of appropriate quality and safety, national and/or international platforms are needed that provide consumers with reliable guidance on evidence-based and effective web-based intervention options. For example, the E-Mental Health Strategy for Australia (Australian Government Department of Health and Ageing, 2012) outlines the development of an e-mental health portal that provides reliable information and accessible pathways for consumers and caregivers to navigate and use evidence-based web-based mental health support. In addition, there is little consistent guidance on necessary quality standards, as well as legal and ethical issues regarding web-based interventions for professionals. There is, for example, the Suggested Principles for the Online Provision of Mental Health Services by the International Society for Mental Health Online; however, this document mainly addresses online counselling and there are no guidelines specifically addressing web-based programs. In the context of mental health apps, a review has also highlighted the need for standards and guidelines for developers to follow and frameworks for consumers to assess credibility and legitimacy (Shen et al., 2015).

Concerning the evidence base of the included programs, all were found to be based on CBT principles. This is consistent with prior reviews, which found that some form of CBT or other behavioural therapy was included in most web-based interventions (Siemer et al., 2011), as well as in publically available web-based intervention programs for depression (Renton et al., 2014). In general, research evidence indicates that CBT is an effective treatment for anxiety disorders (e.g., Hofmann & Smits, 2008; Stewart & Chambless, 2009). This suggests that all reviewed programs were to some extent developed using an evidence-based approach; however, this does not guarantee that the evidence-based approach used is necessarily effective in the program.

In this context, another major finding was that several programs did not provide any research evidence or provided only limited evidence of the efficacy of the treatment. This is similar to findings from the review of web-based depression

interventions, which showed that 63% had not been evaluated using RCTs (Renton et al., 2014). This finding is interesting considering the numerous systematic reviews and meta-analyses of web-based interventions (Barak et al., 2008; Mewton et al., 2014; Spek et al., 2007). However, some may currently be in the process of being evaluated and not yet published. In addition, the absence of evidence of efficacy in terms of RCTs for a particular intervention also does not necessarily mean that the intervention does not work, especially if it is based on evidence-based approaches such as CBT. For treatment efficacy, the predominant model has been “empirically supported treatments” (Chambless & Hollon, 1998). However, recently it has been proposed that clinical treatment decisions should be based on the best available research evidence, a clinician’s expertise, and patient characteristics (Tolin, McKay, Forman, Klonsky, & Thombs, 2015). It has also been argued that RCTs evaluating interventions should focus on evaluating intervention principles rather than each actual implementation (Mohr et al., 2015). However, unlike therapists who require accreditation to practice an evidence-based approach such as CBT, no such accreditations currently exist for web-based programs. Hence, any web-based program can claim to be based on CBT, but may not fulfil all requirements and therefore not work, which is especially problematic for programs requiring an access fee. Therefore, programs should ideally undergo appropriate empirical evaluation before being made available online. The development of an accreditation service for web-based interventions may help improve this issue and enable consumers to make more informed decisions. It is also important to acknowledge competing interests within the eHealth space. Developers with a commercial focus may not be as concerned about treatment efficacy and researchers developing programs may not have the resources to sustain a publically available program. For programs for which published empirical studies were identified in this review, there was a large variety of study designs and quality of evidence. Only This Way Up programs, MoodGYM, myCompass, Beating the Blues, and FearFighter underwent rigorous evaluation through RCTs.

Limitations

In regard to this study, a few limitations have to be noted. The representativeness and comprehensiveness of the search and identified programs may be affected by various characteristics of the web, search engines, and search terms. First, the ranks of websites vary by location on commercial search engines. The search for this review was performed in the UK and it is likely that the same search in another

country may have yielded different results. The web and search engines are also dynamic. Results of search engines vary over time, meaning searches conducted several months before or after the current search could present a different set of programs. In addition, currently existing programs may change or be discontinued and new programs may be released. It is also possible that some individuals may not use the three search engines and would have therefore received different results. However, a considerable strength of this review is that the three most popular search engines were used.

Secondly, the first 25 hyperlinks from the search were included in this review. It is likely that more programs are available, which at the time did not have the page ranking to be identified by the search. This may especially be the case for recently created services (Cho & Roy, 2004). However, it has been suggested that most people rarely consider more than the first 20 links (Eysenbach et al., 2002); thus, the identified sample of this review is believed to be representative of what an average Internet user might discover when searching the web for web-based intervention options. Page ranking is also influenced by various search engine optimisation techniques, algorithms of the search engines, as well as cookie settings of the browsers (Evans, 2007), and thereby impacts the results of the search. To combat this, we removed search engine histories and cookies were disabled on all three browsers. While this may not be a complete list of currently available web-based programs for anxiety, it is a comprehensive snapshot of programs found in March 2015.

Third, the program evaluation scale used was an adapted version of the scoring system used by Renton et al. (2014). However, the summative scores do not account for the fact that items within this scale may not be equivalent in terms of importance. Using different weightings based on importance would add great value to the rating. The development of such a scale was considered beyond the scope of this review; however, it would be important to develop a weighted scale for similar future reviews.

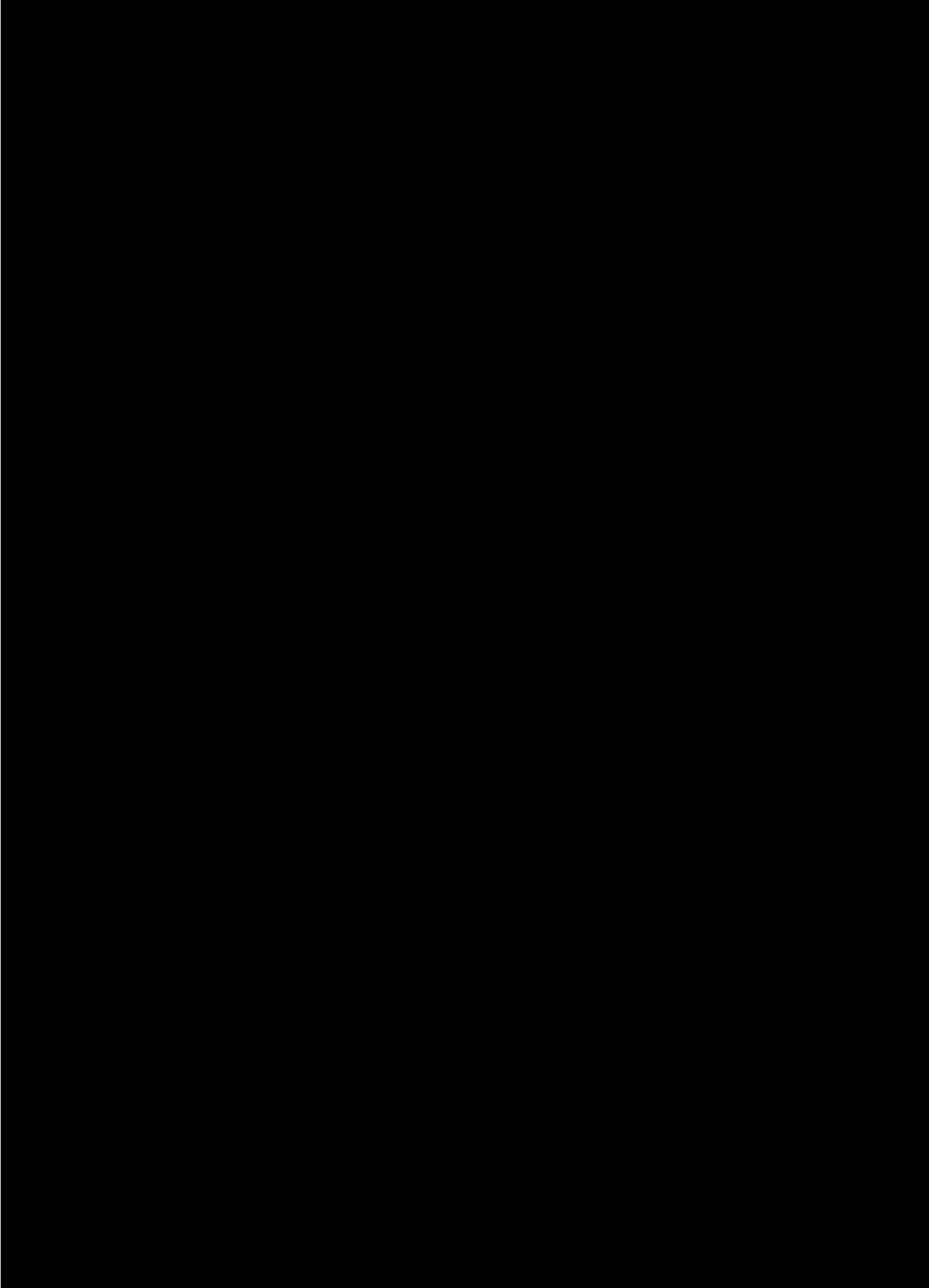
Lastly, it is important to acknowledge that the definition of web credibility is complex and consists of multiple dimensions (Shah, Ravana, Hamid, & Ismail, 2015). In the case of this paper, only a limited number of credibility dimensions that focused on trustworthiness rather than expertise were assessed.

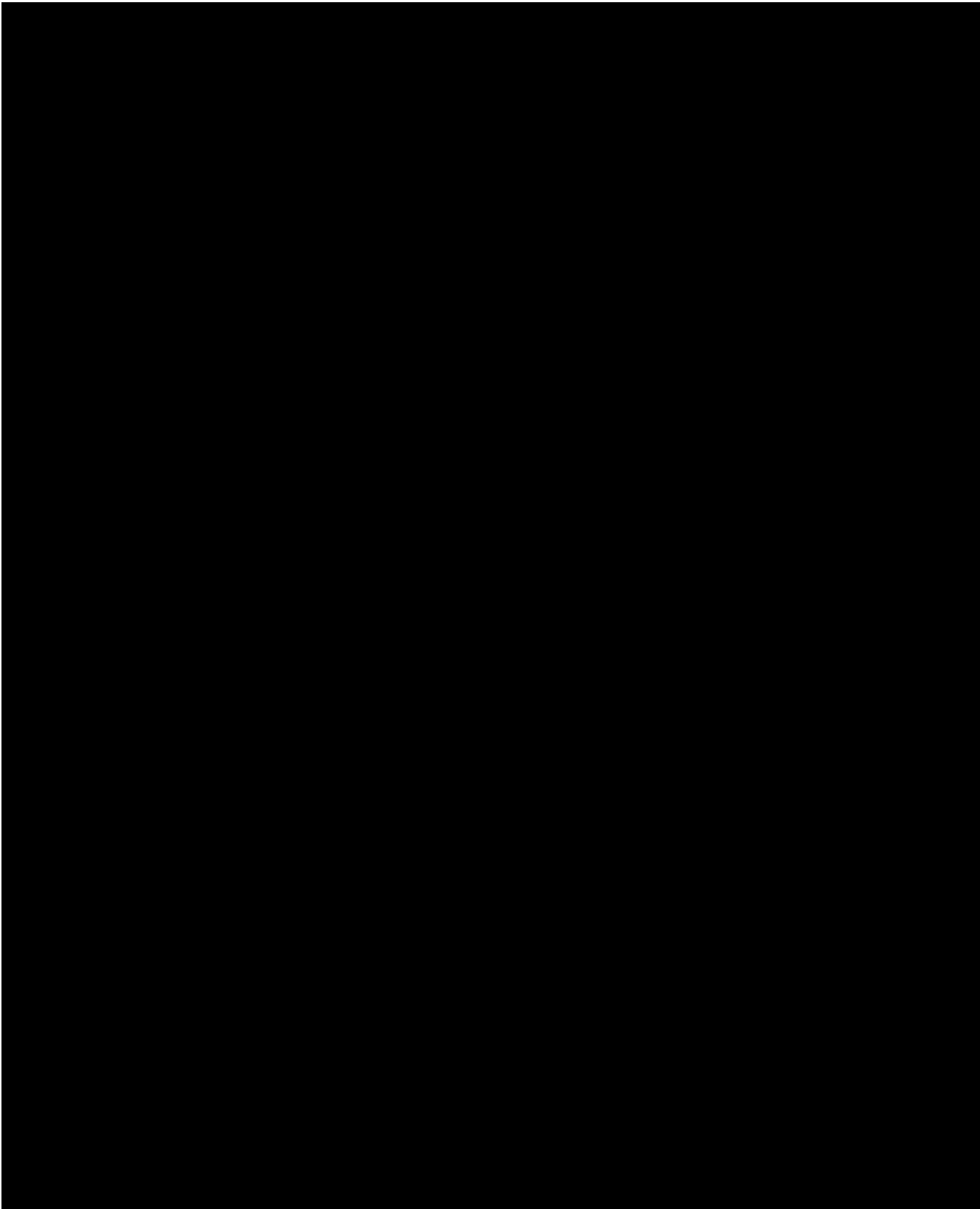
Conclusion

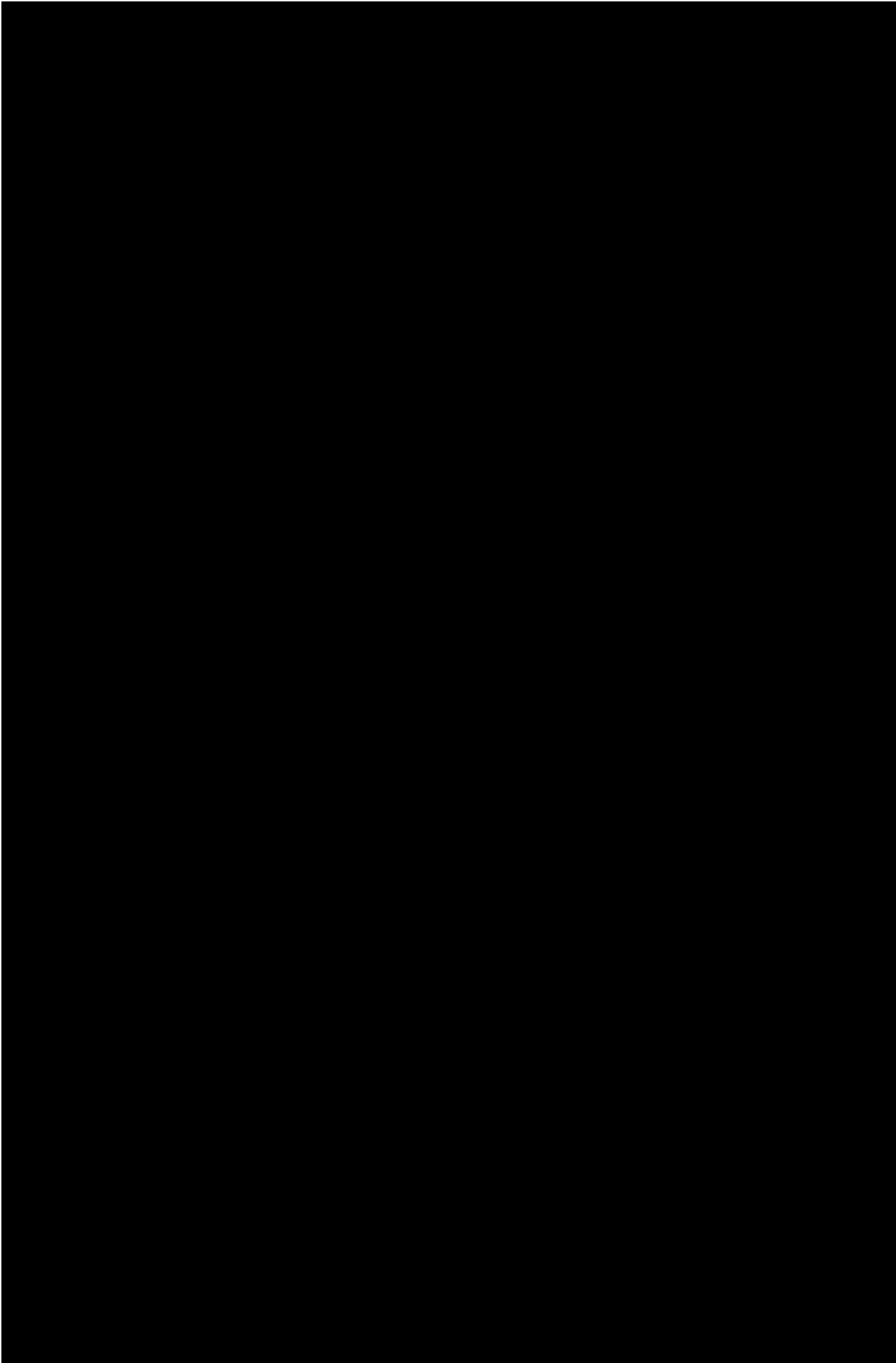
This review found that individuals searching for web-based intervention programs for anxiety are presented with a large number and variety of potential

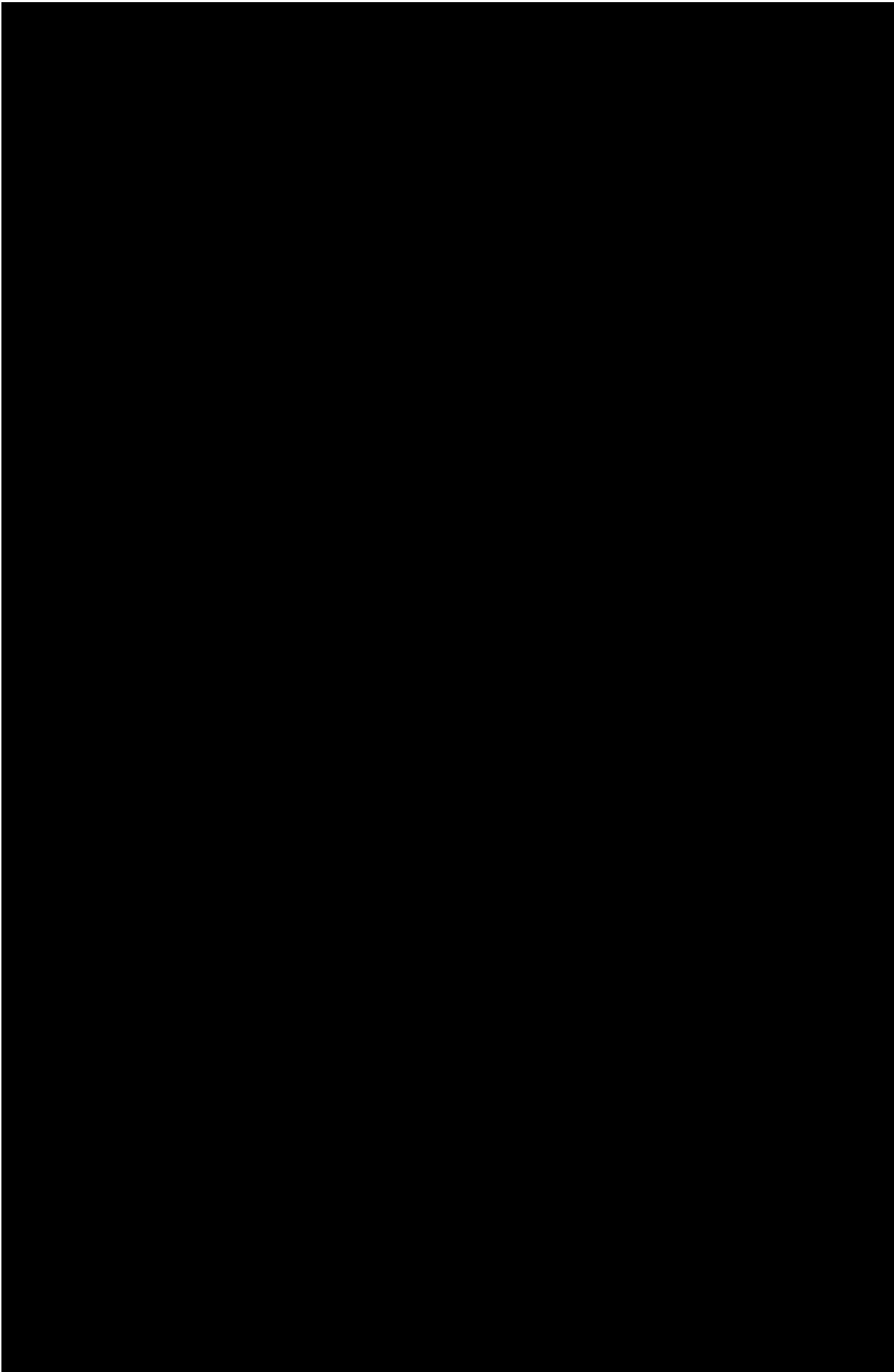
programs to choose from. For consumers with limited knowledge about intervention quality criteria it may be challenging to choose an appropriate program. With the number of people using the Internet increasing, it is likely that more individuals will search for information about treatments options in general and, specifically, online interventions. It is therefore important for health professionals working with mental health clients to be aware of the diversity of web-based interventions and that not all have had their efficacy tested in robust research trials. Directories such as Beacon can assist clinicians, as well as individuals in this task; however, it is important to keep services like these up-to-date. There is a definite need for consistent guidelines and standards on developing and providing web-based mental health intervention programs for professionals and a platform with reliable up-to-date information for professionals and consumers about the quality and accessibility of web-based interventions. This review is the first to identify and review web-based anxiety interventions available on the web. Therefore, research is needed in reviewing and evaluating web-based intervention programs for other mental health related issues. There is also a need to develop standardised evaluation scales for publically available web-based intervention programs to facilitate the rating process and ensure its rigor. For future research, it may also be interesting to explore health professionals' and consumers' experiences and perceptions of those programs.

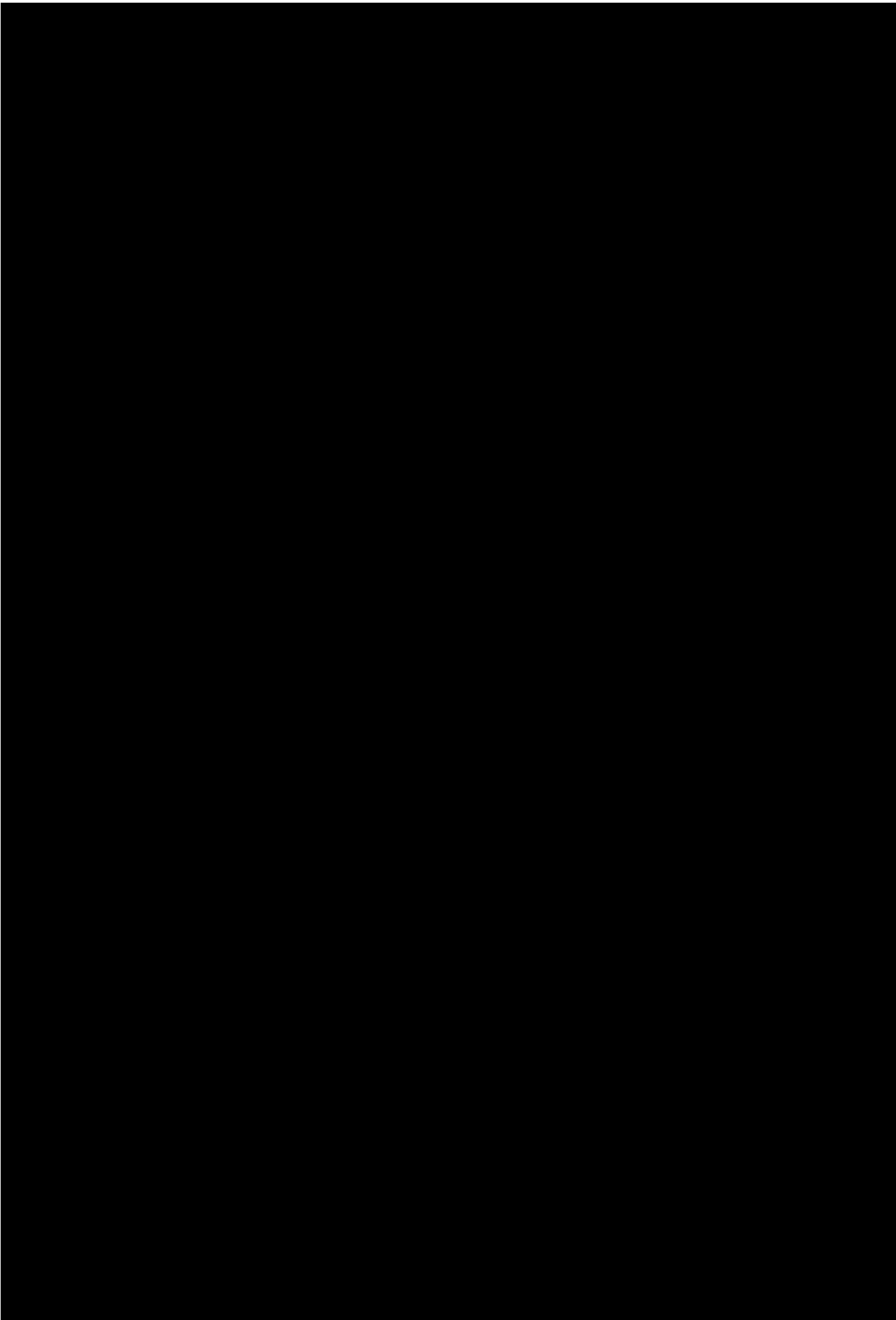
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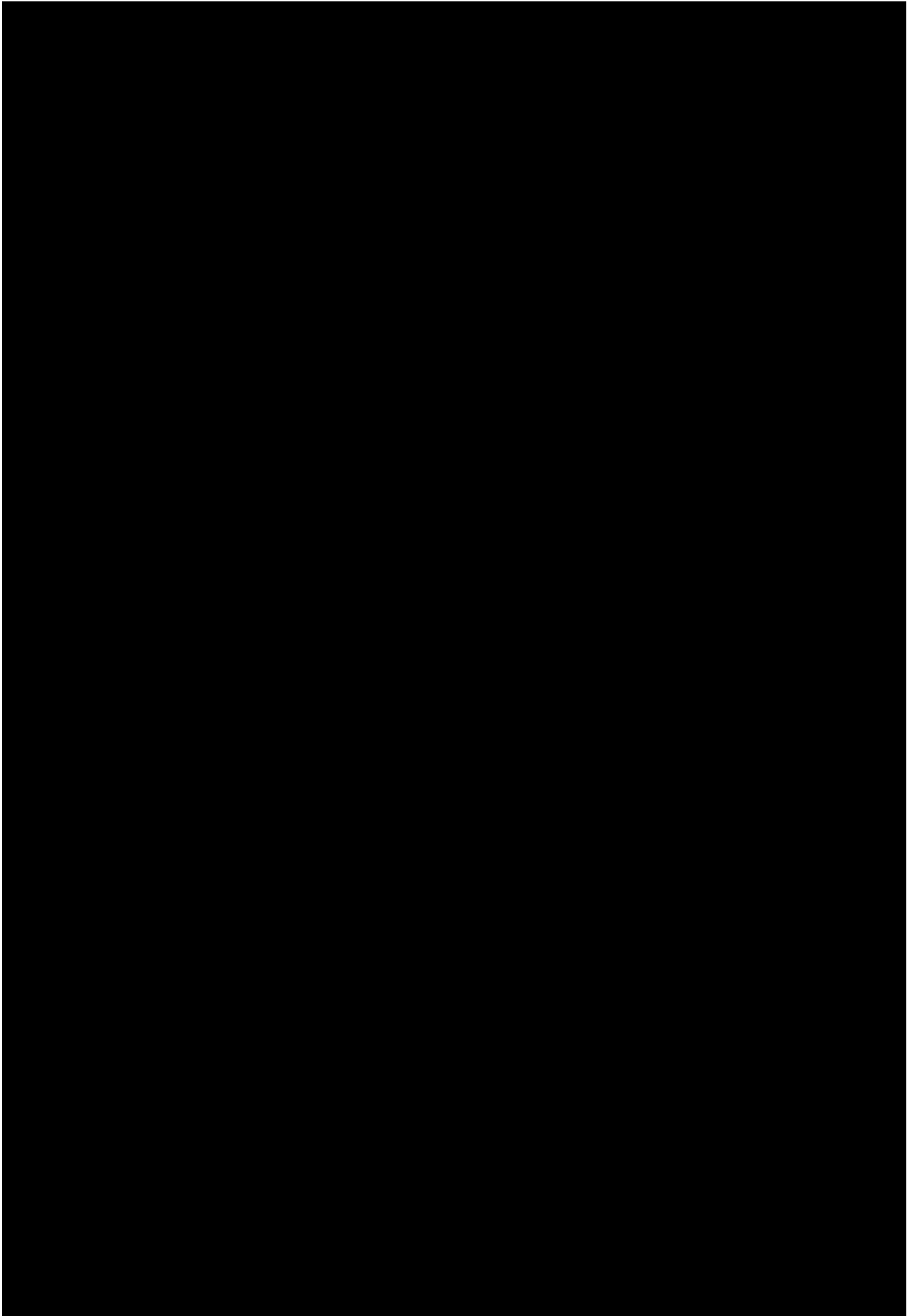


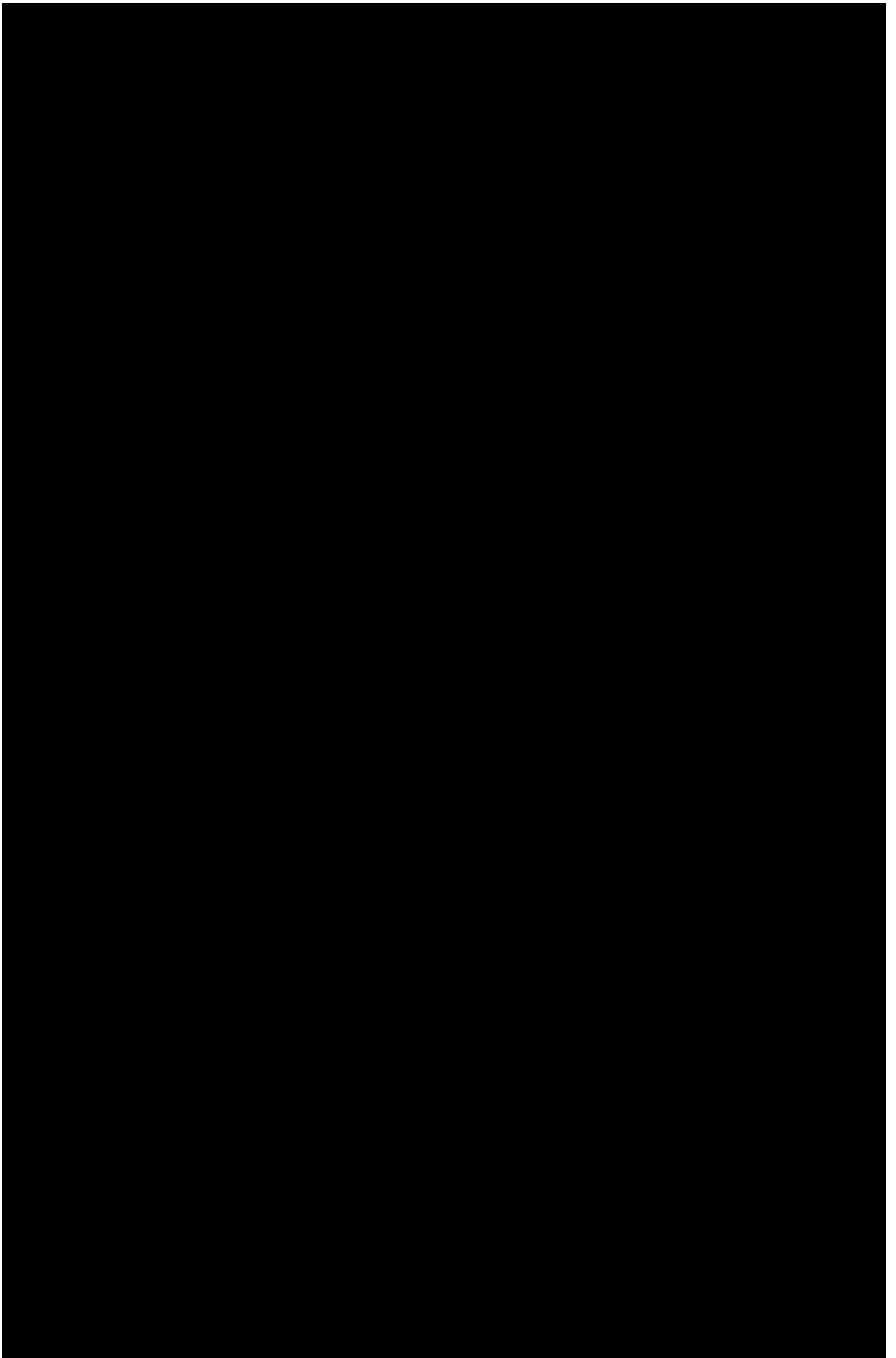


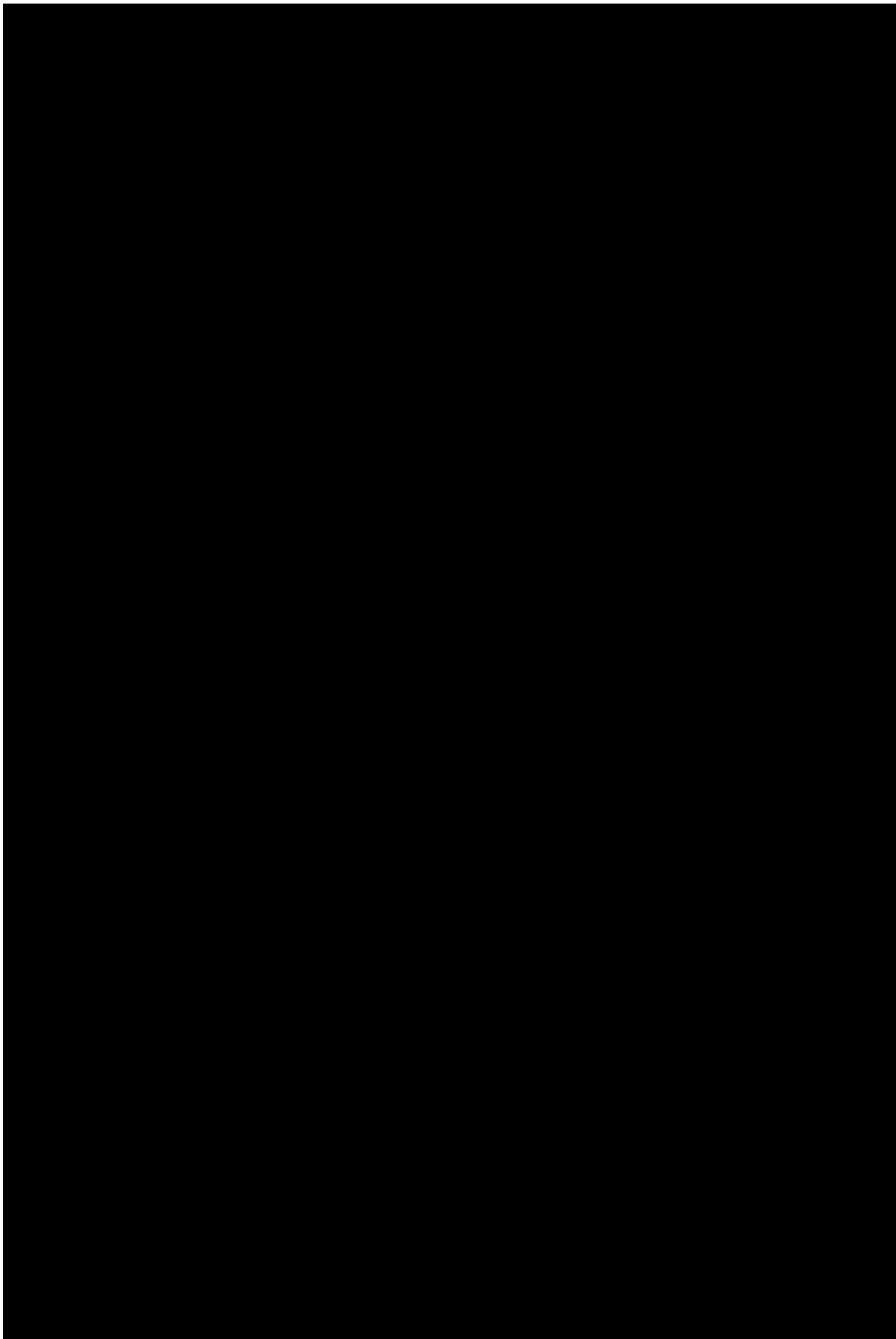


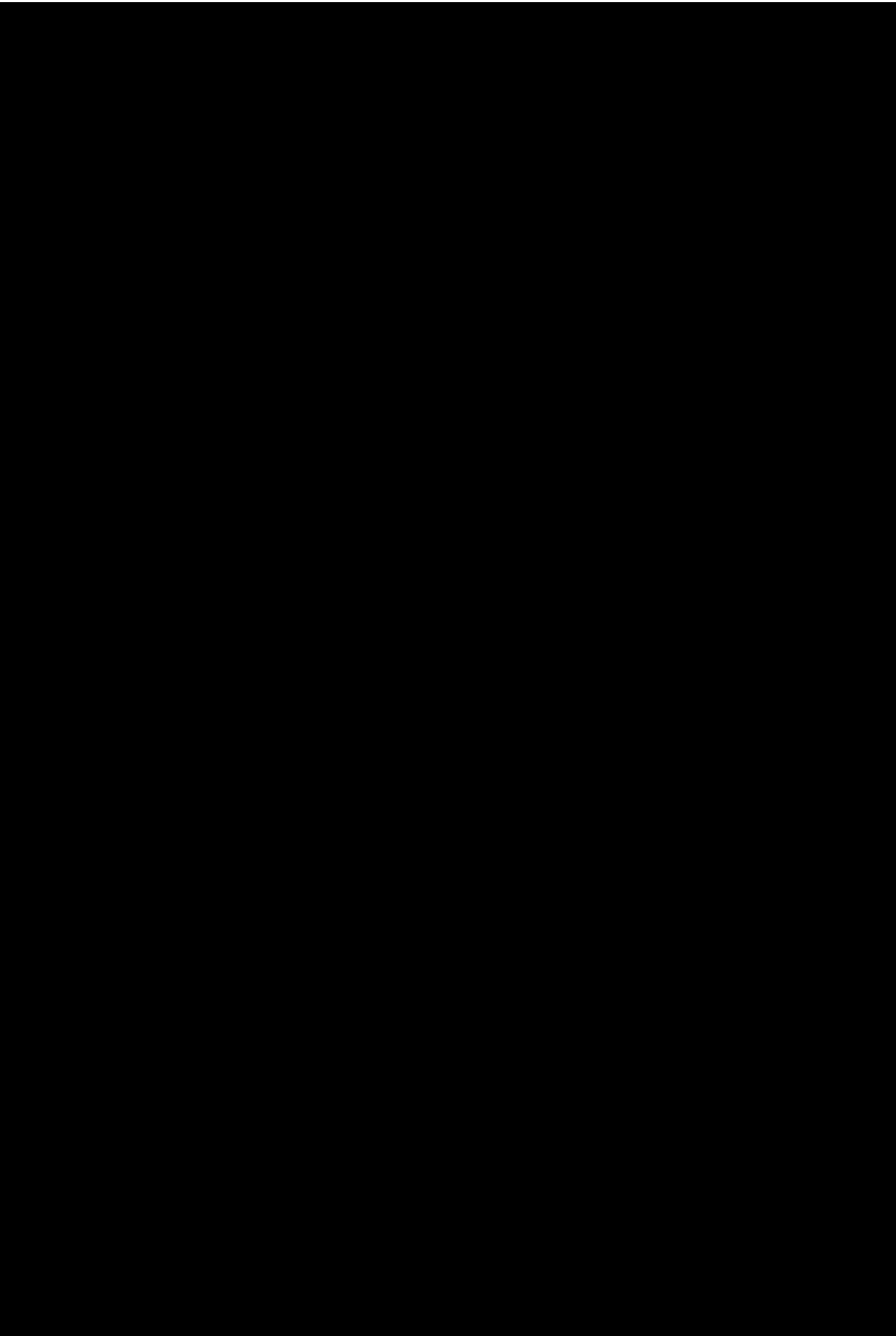


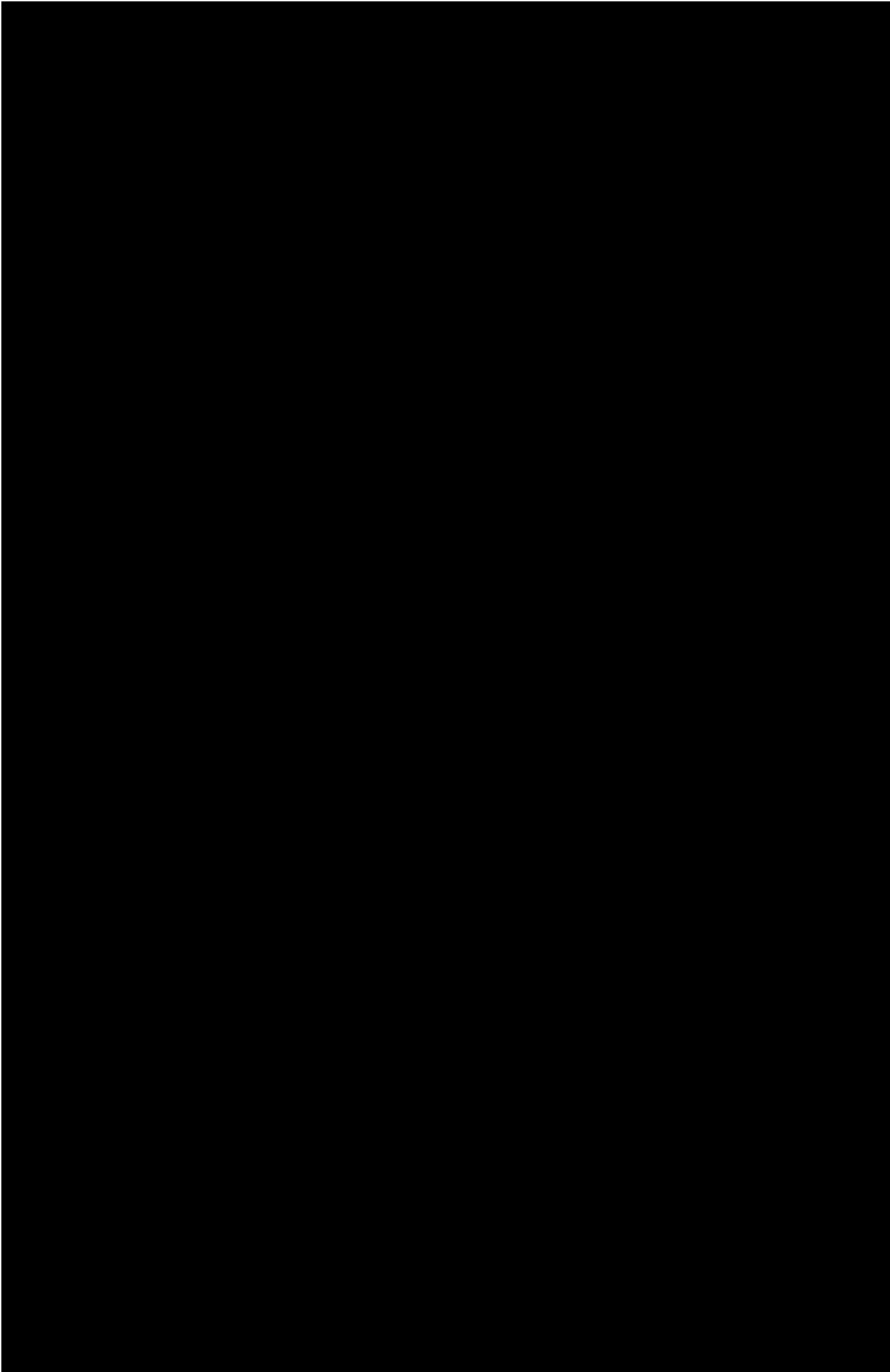


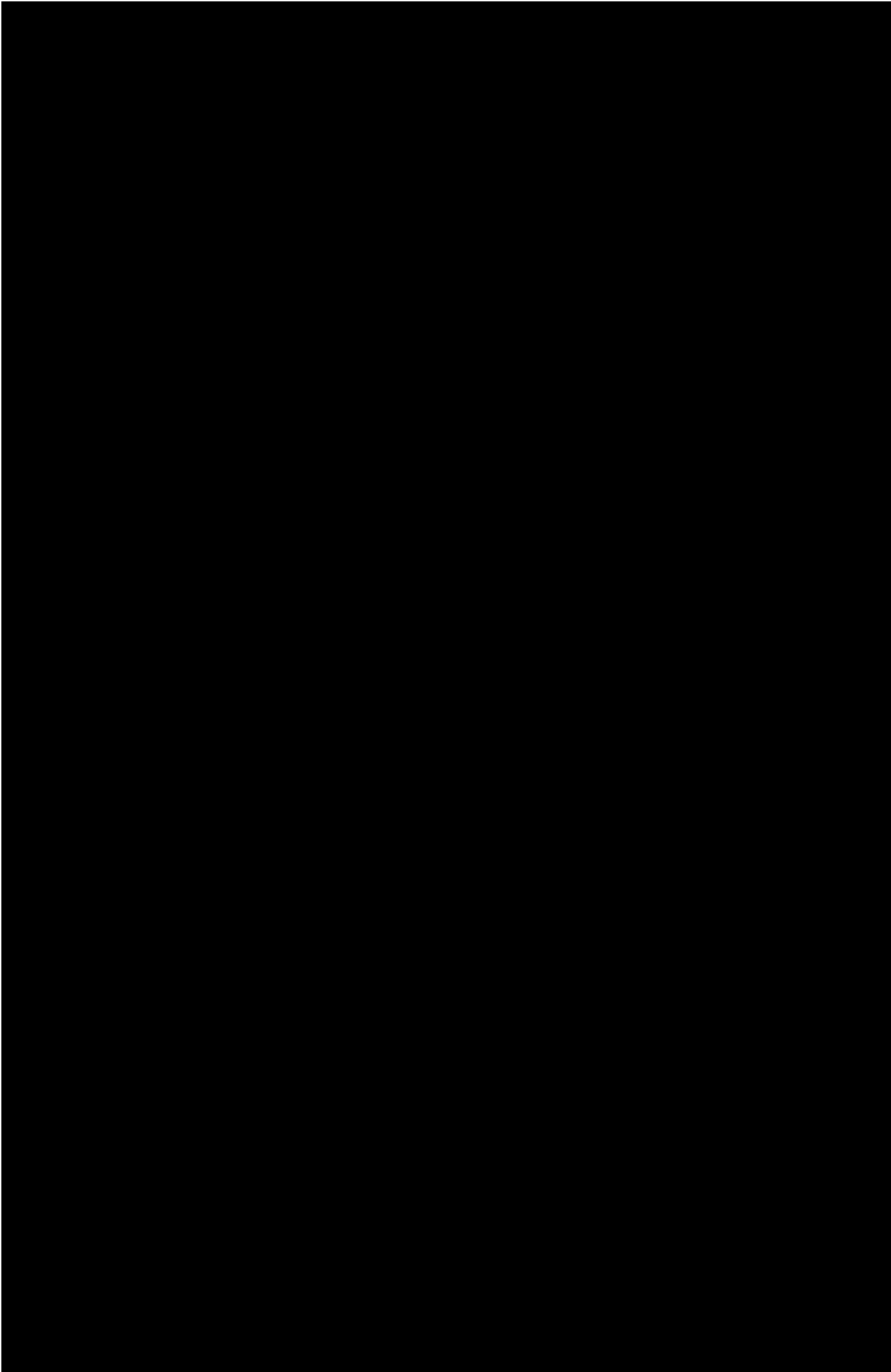


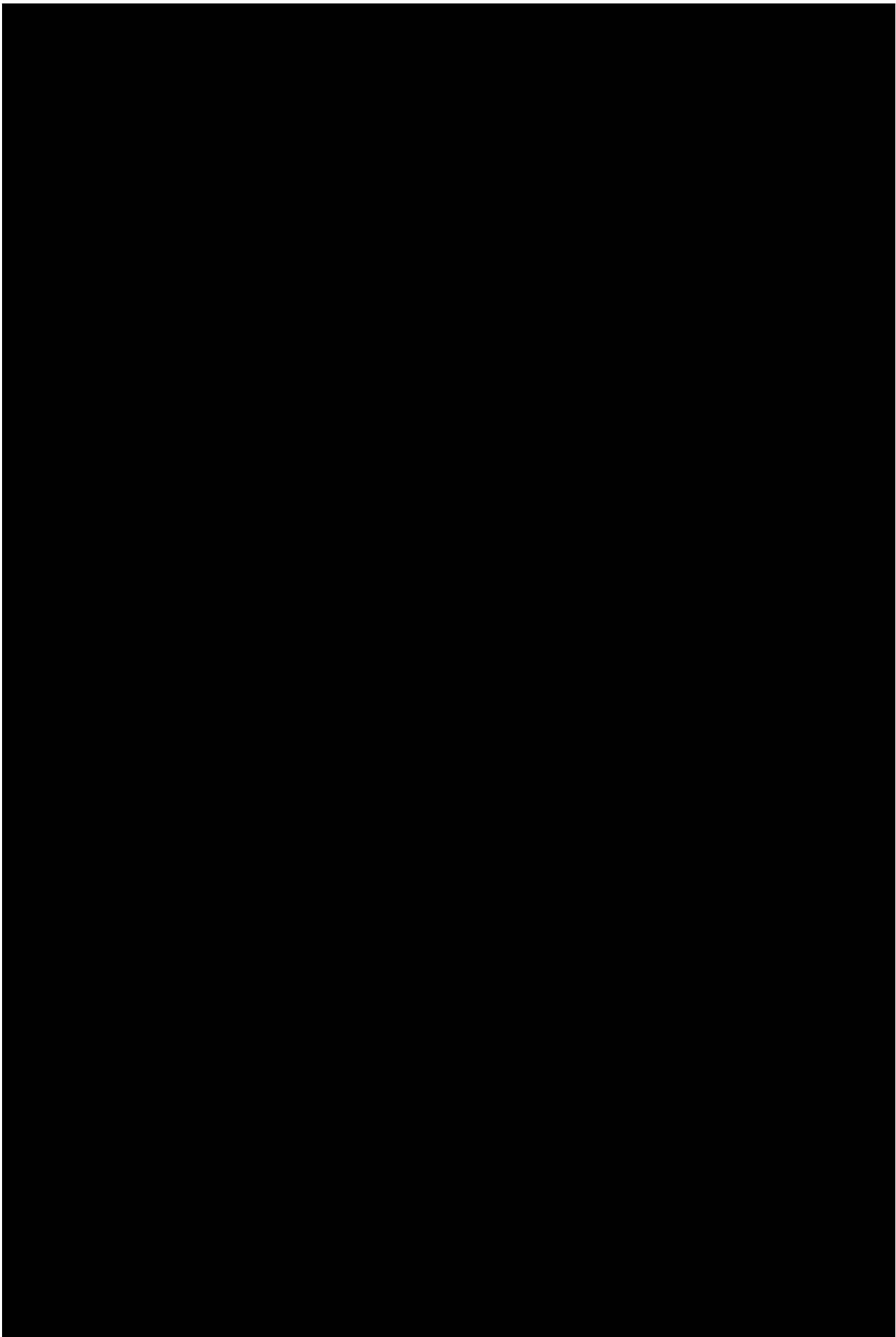


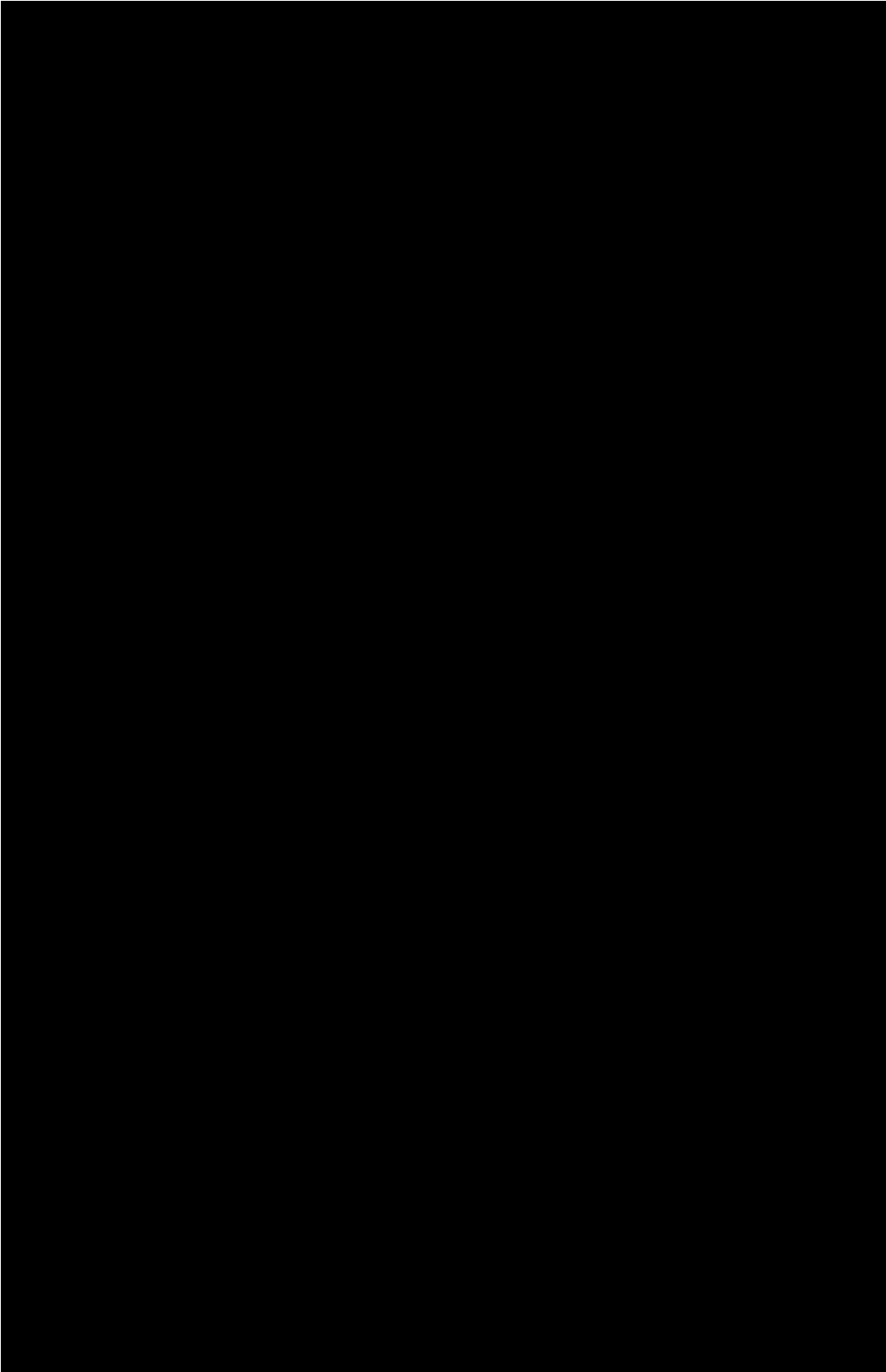






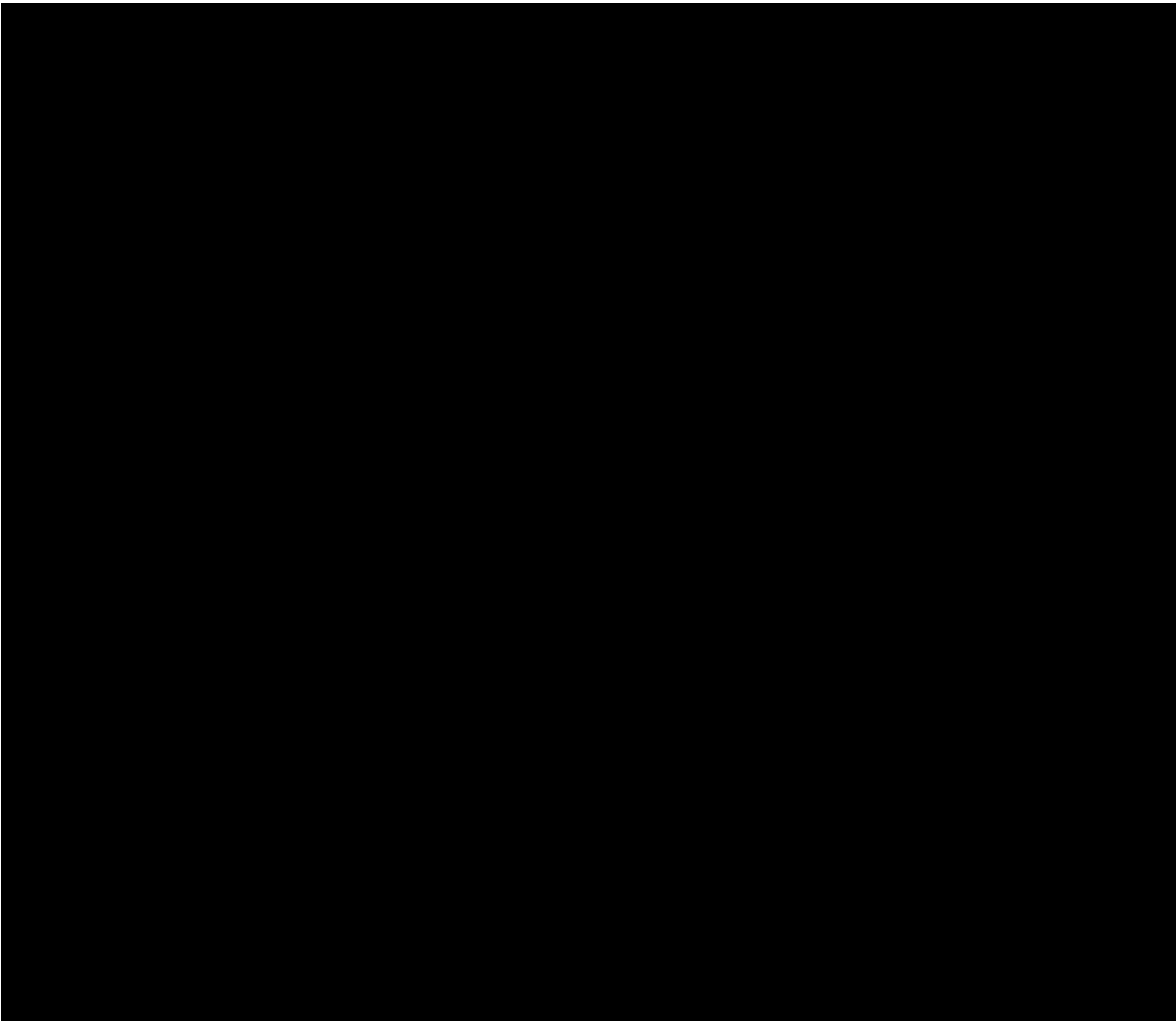


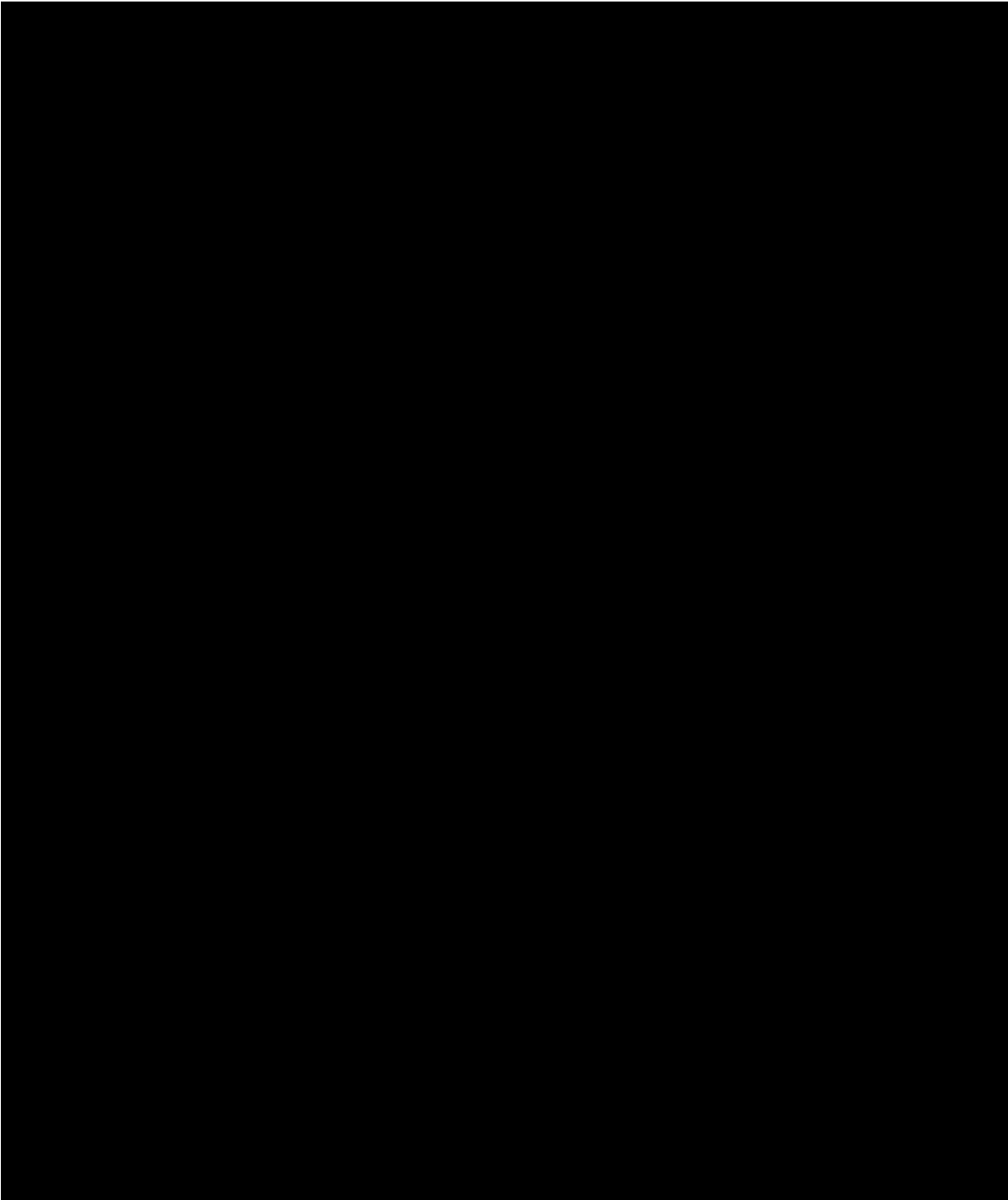


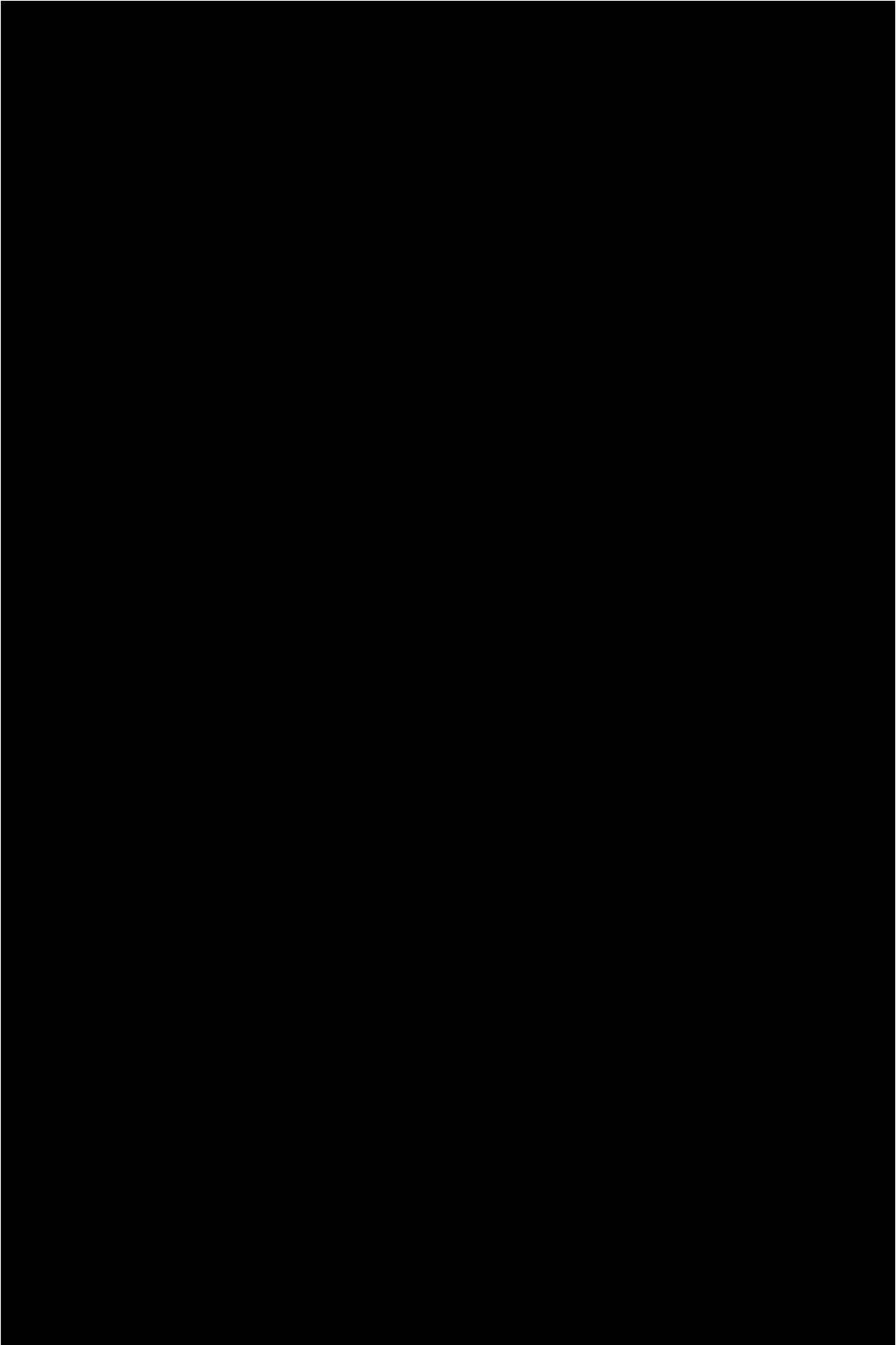


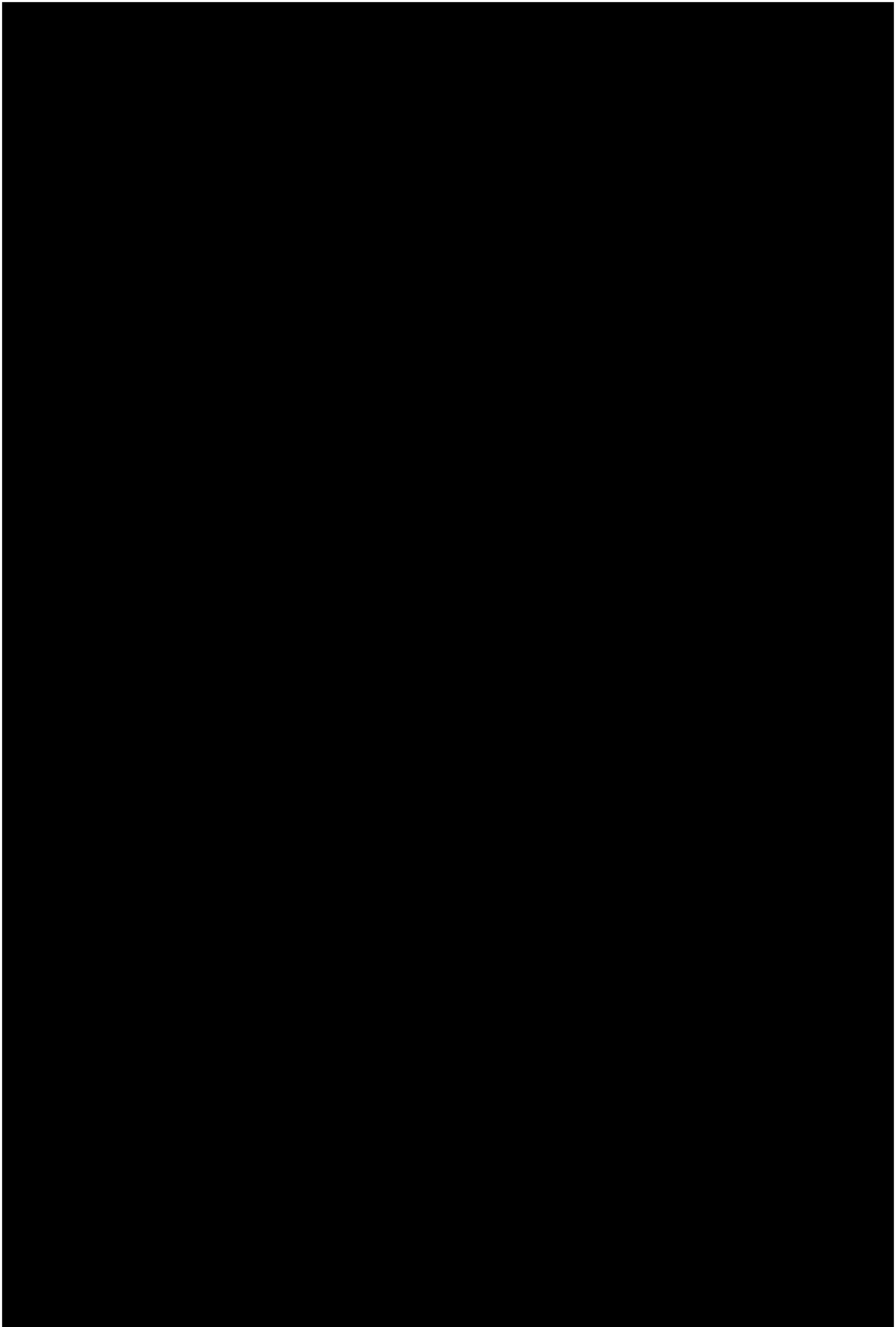
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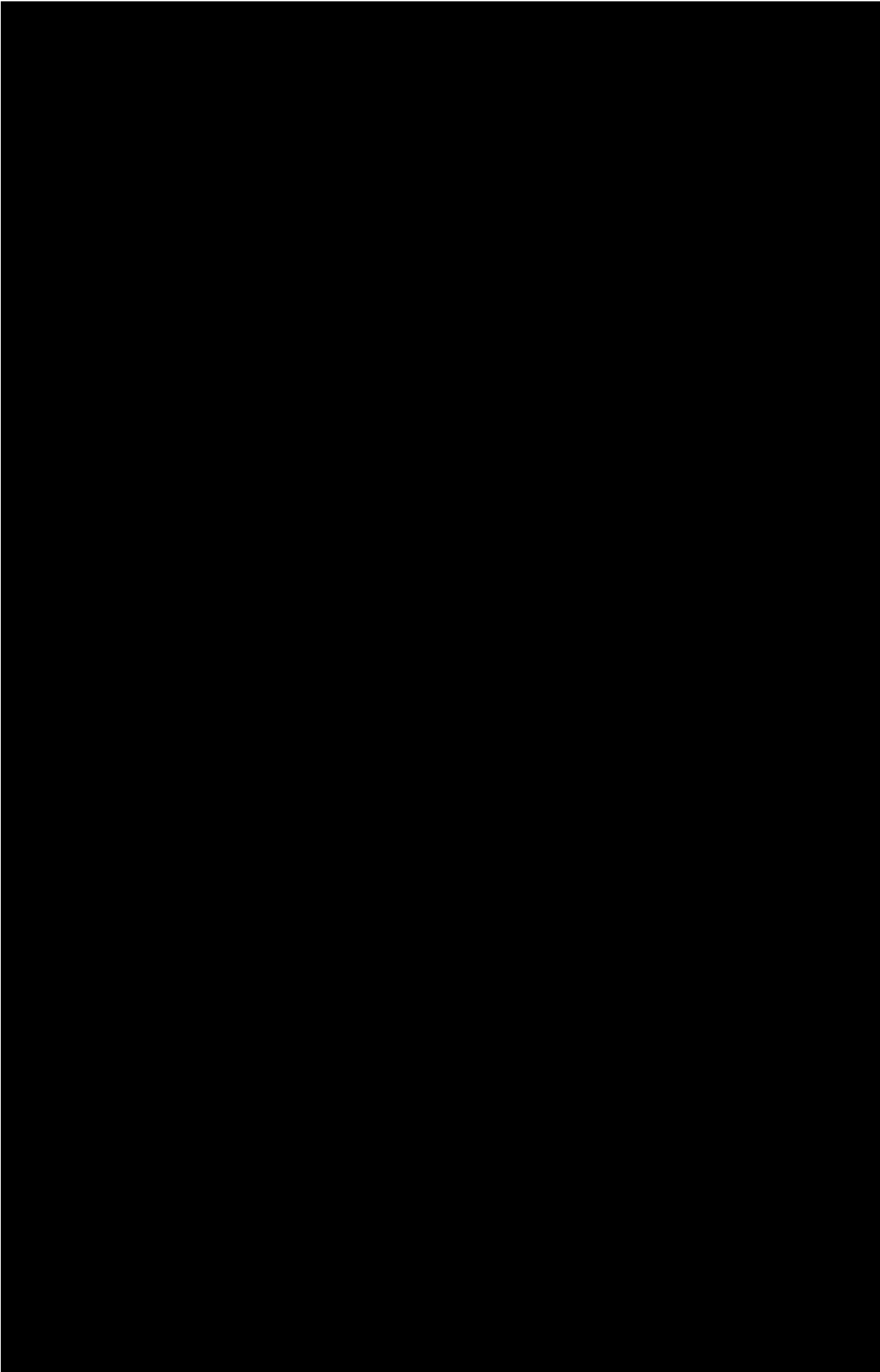


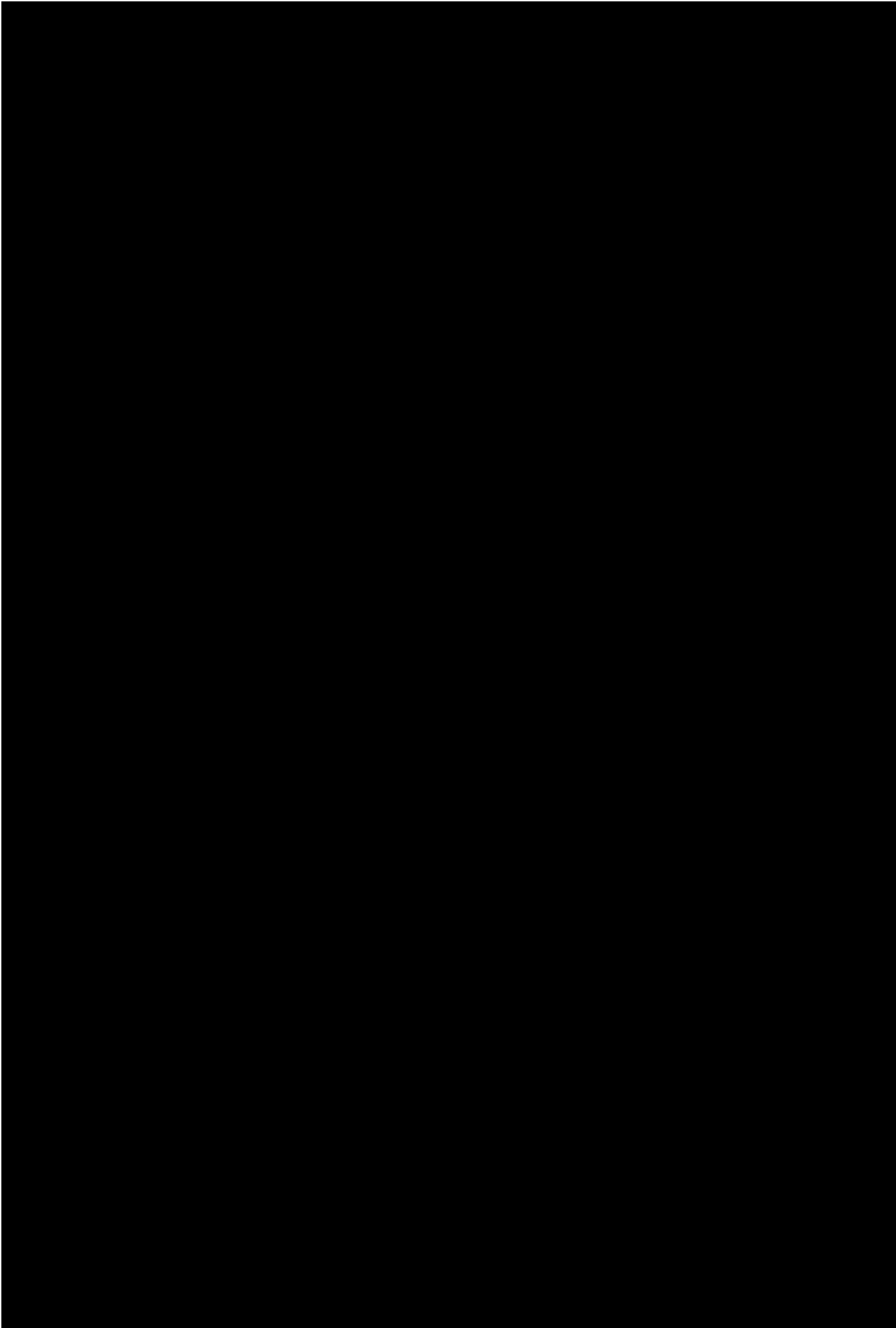


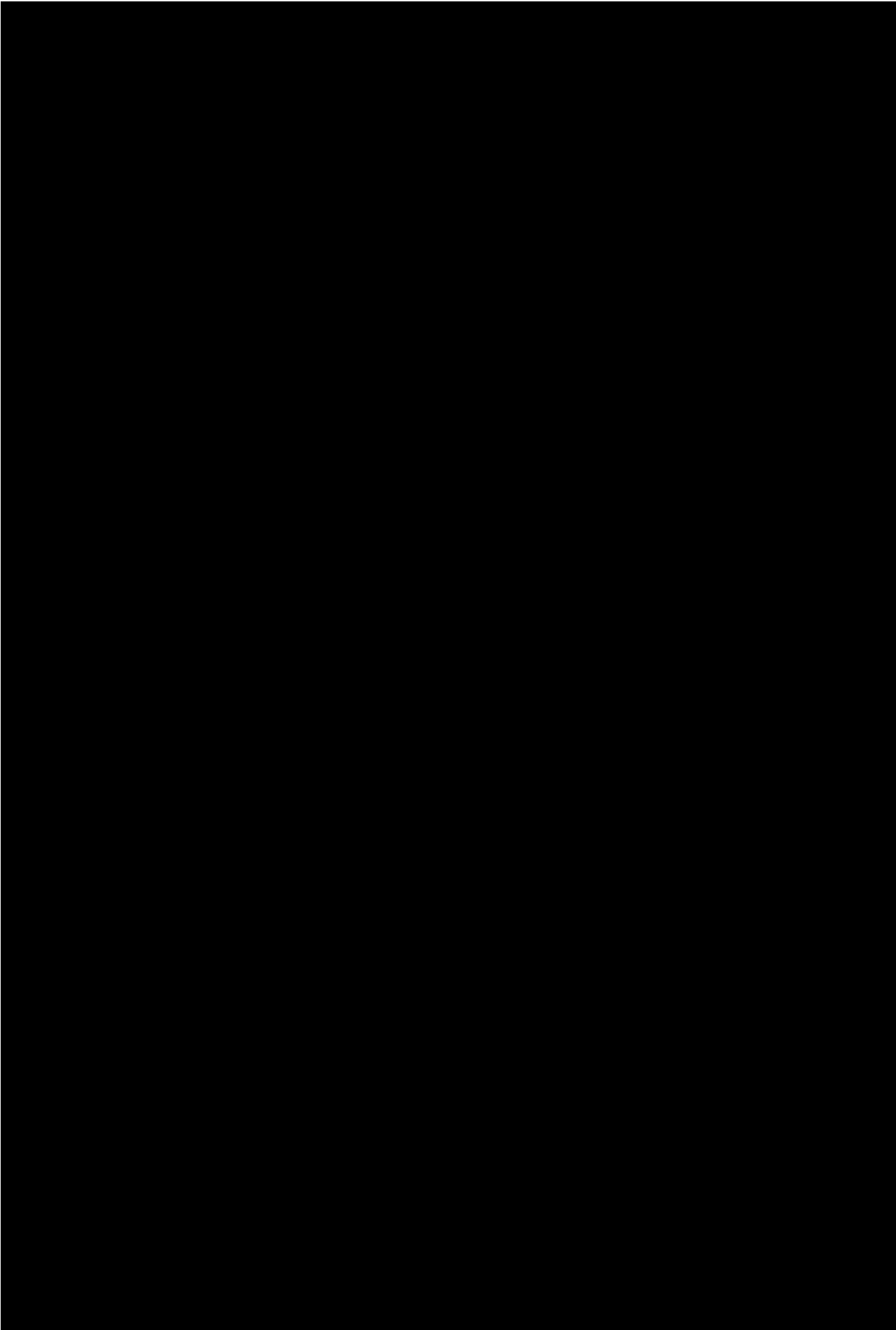


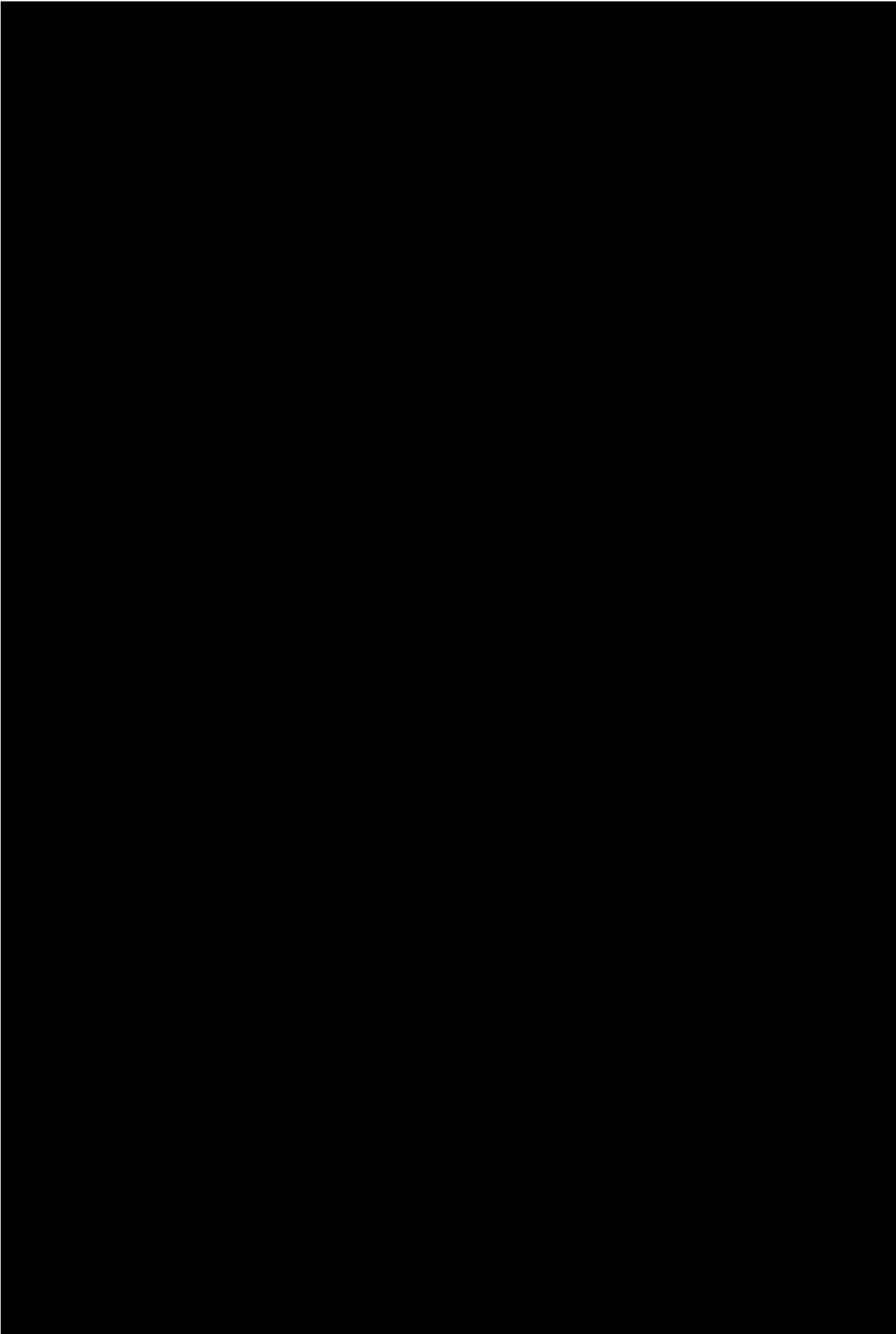


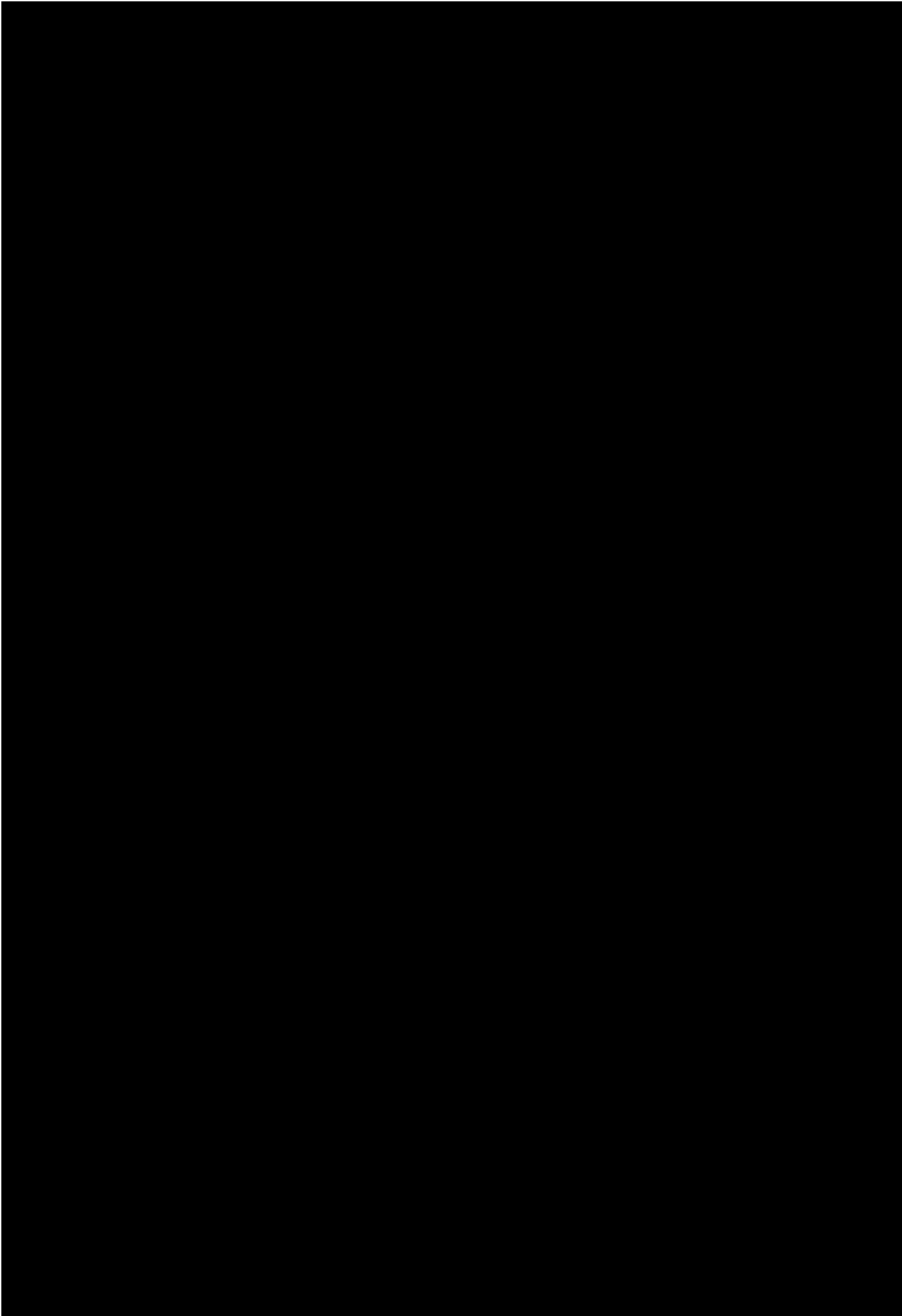


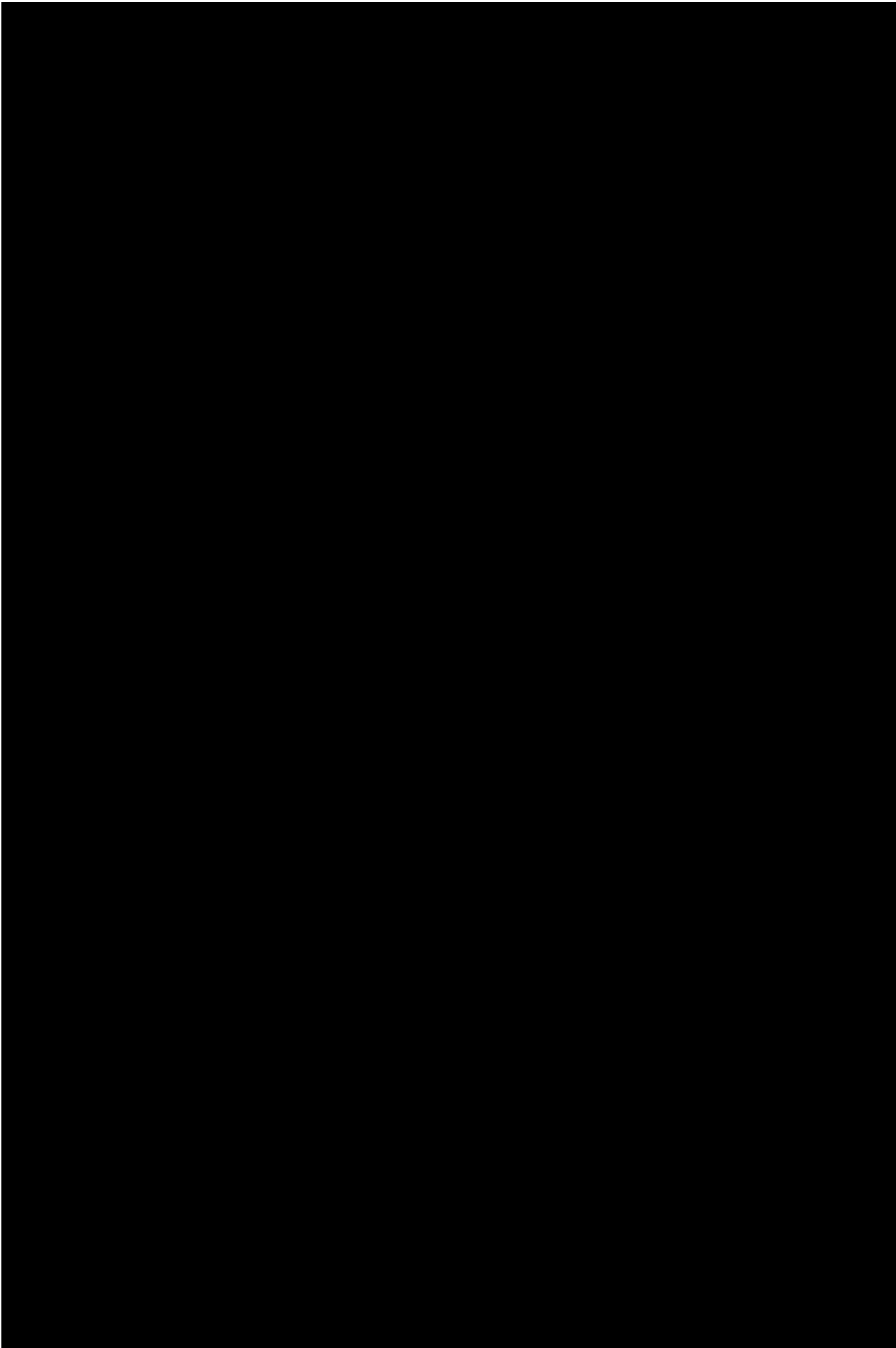


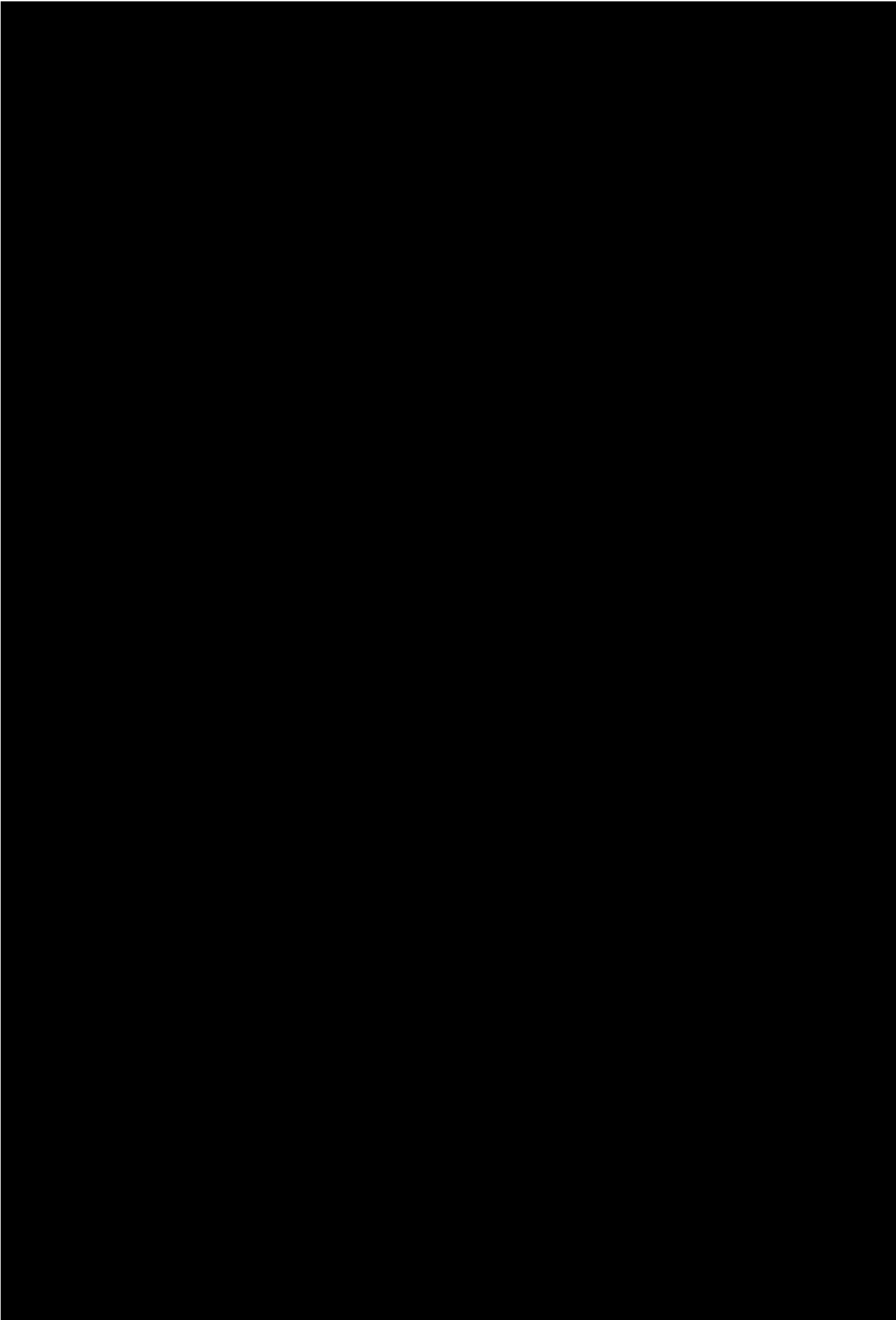


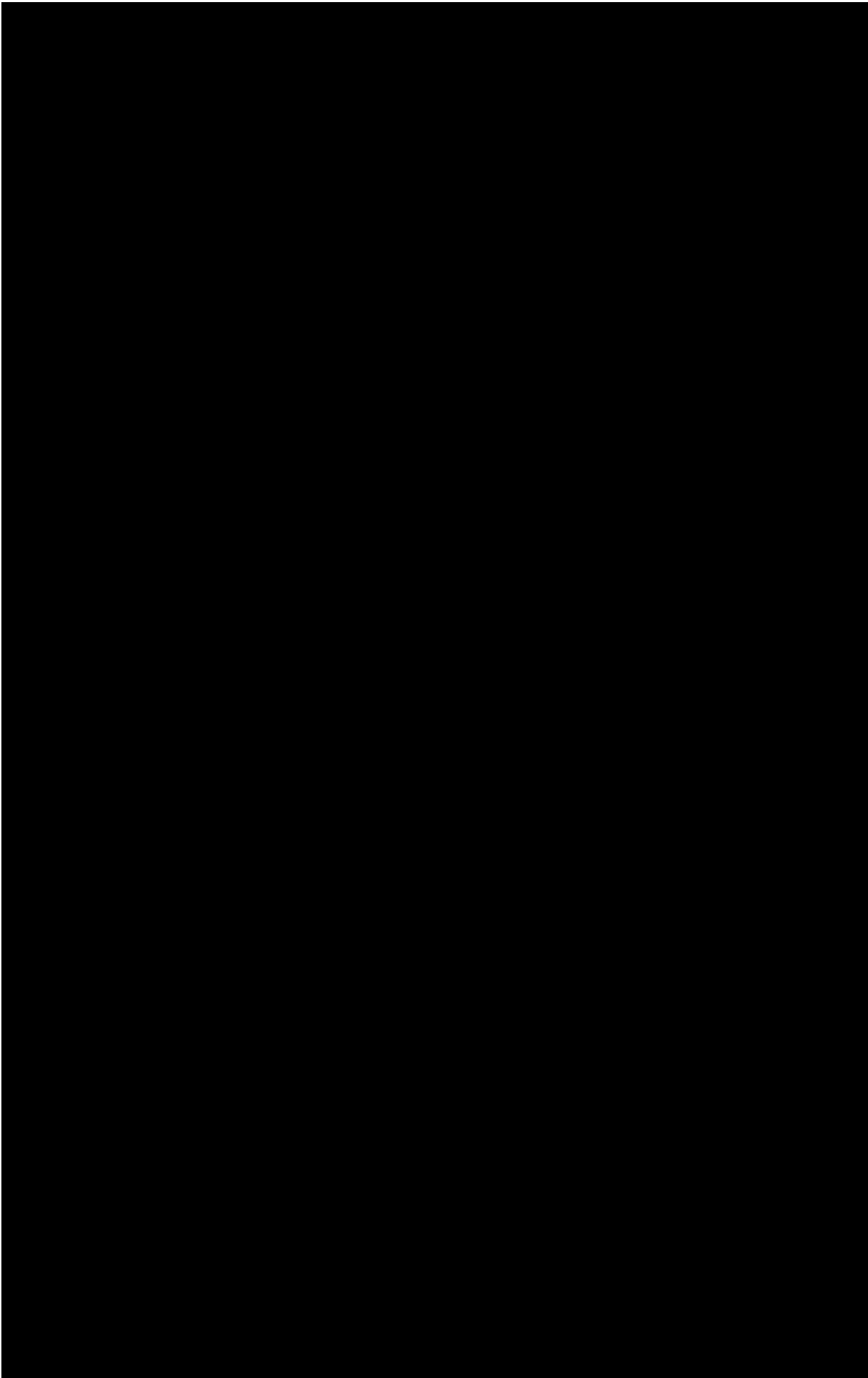




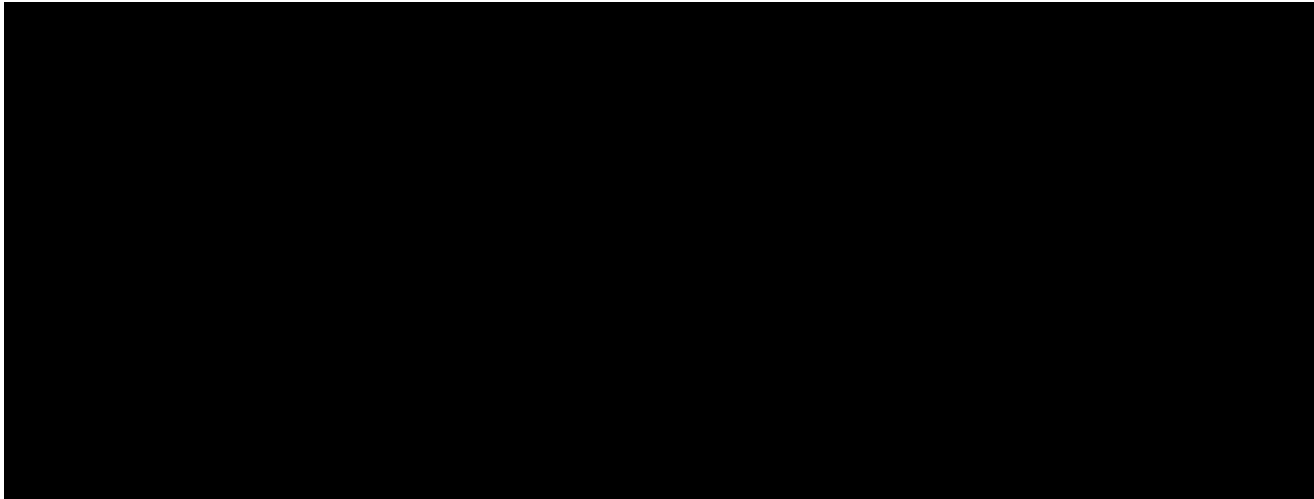


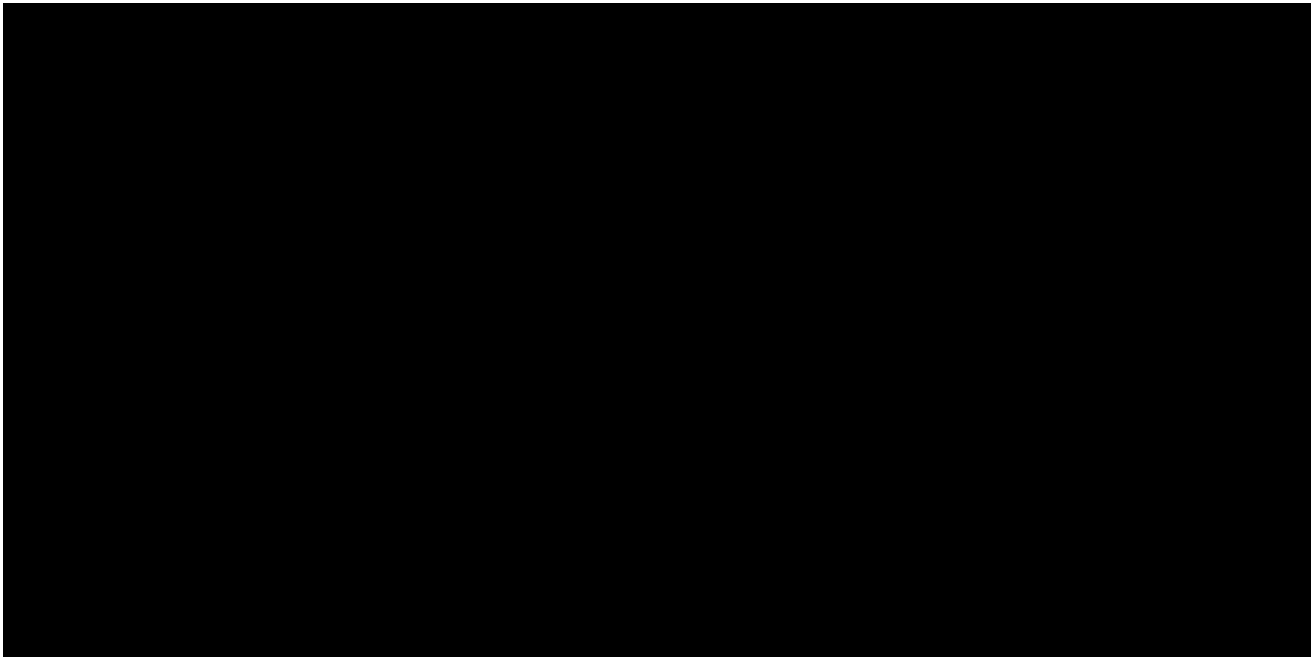


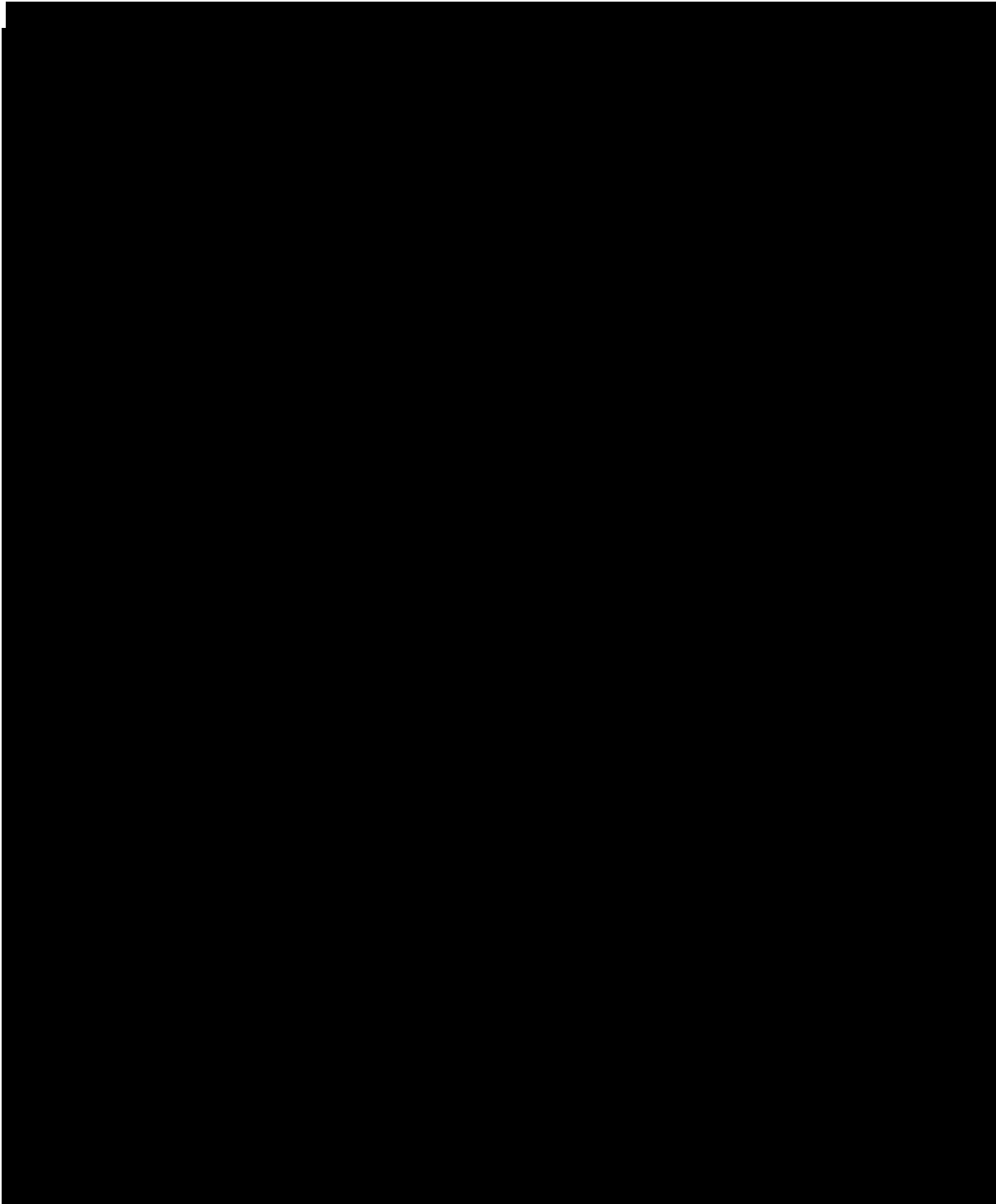


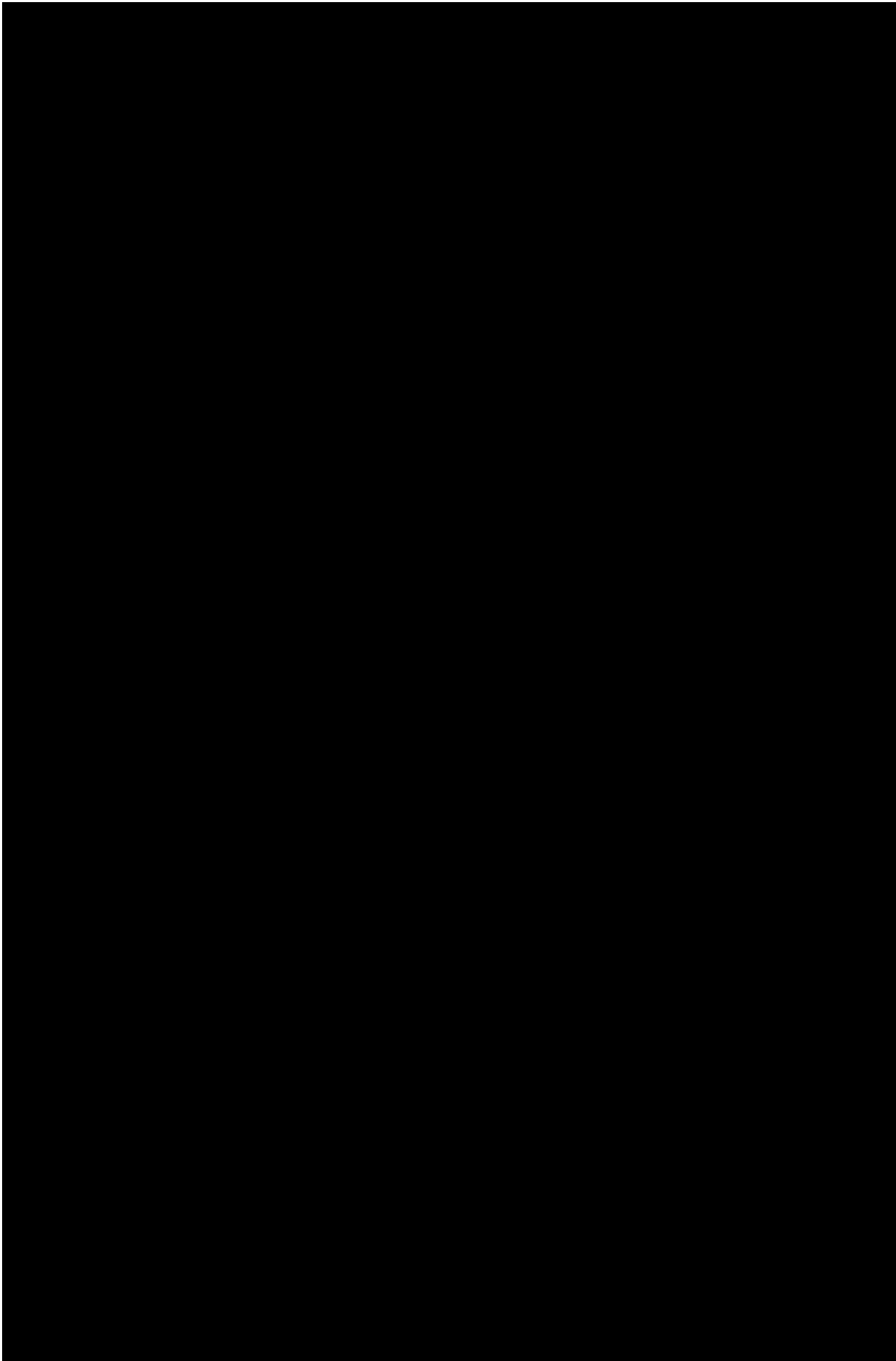


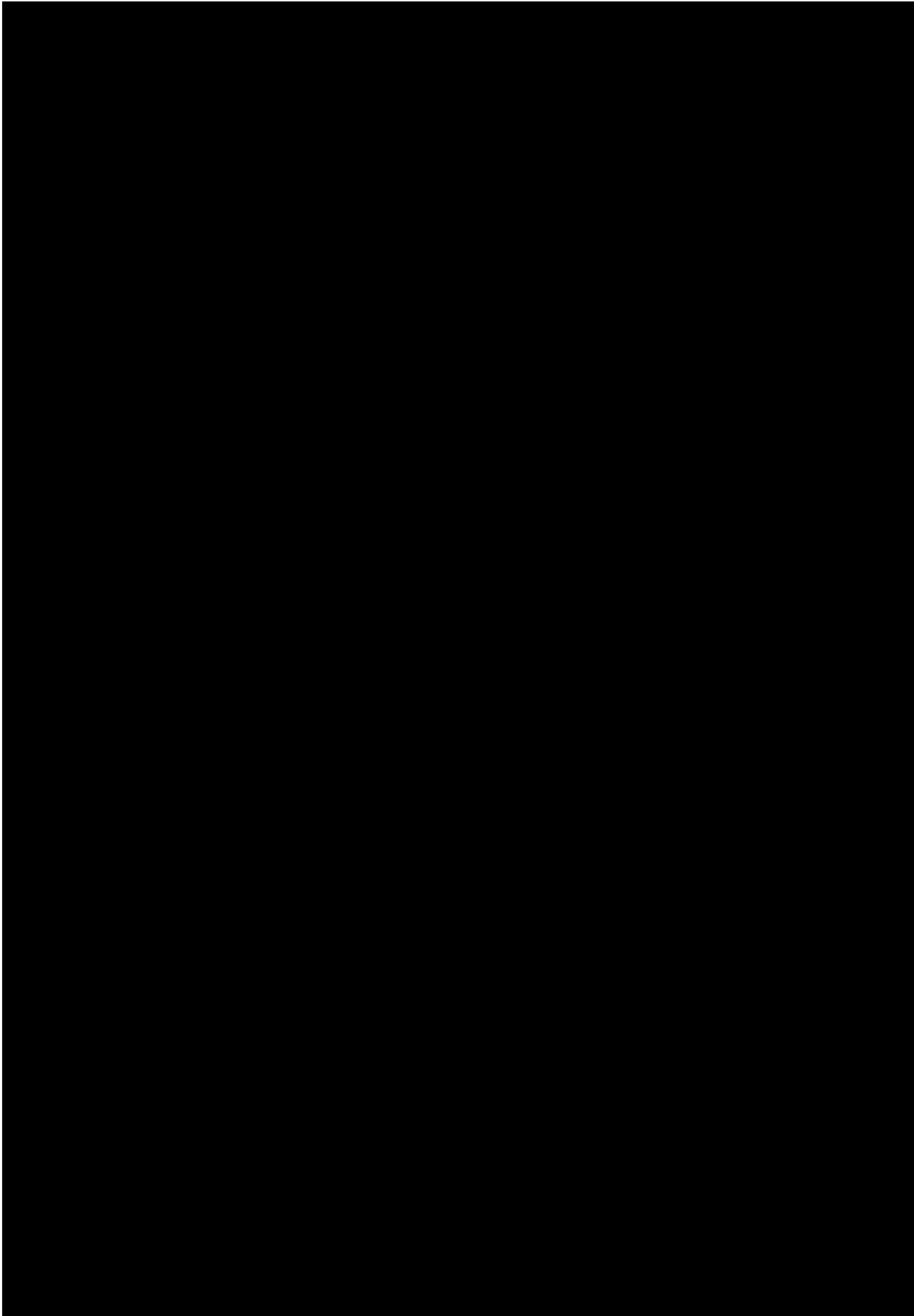
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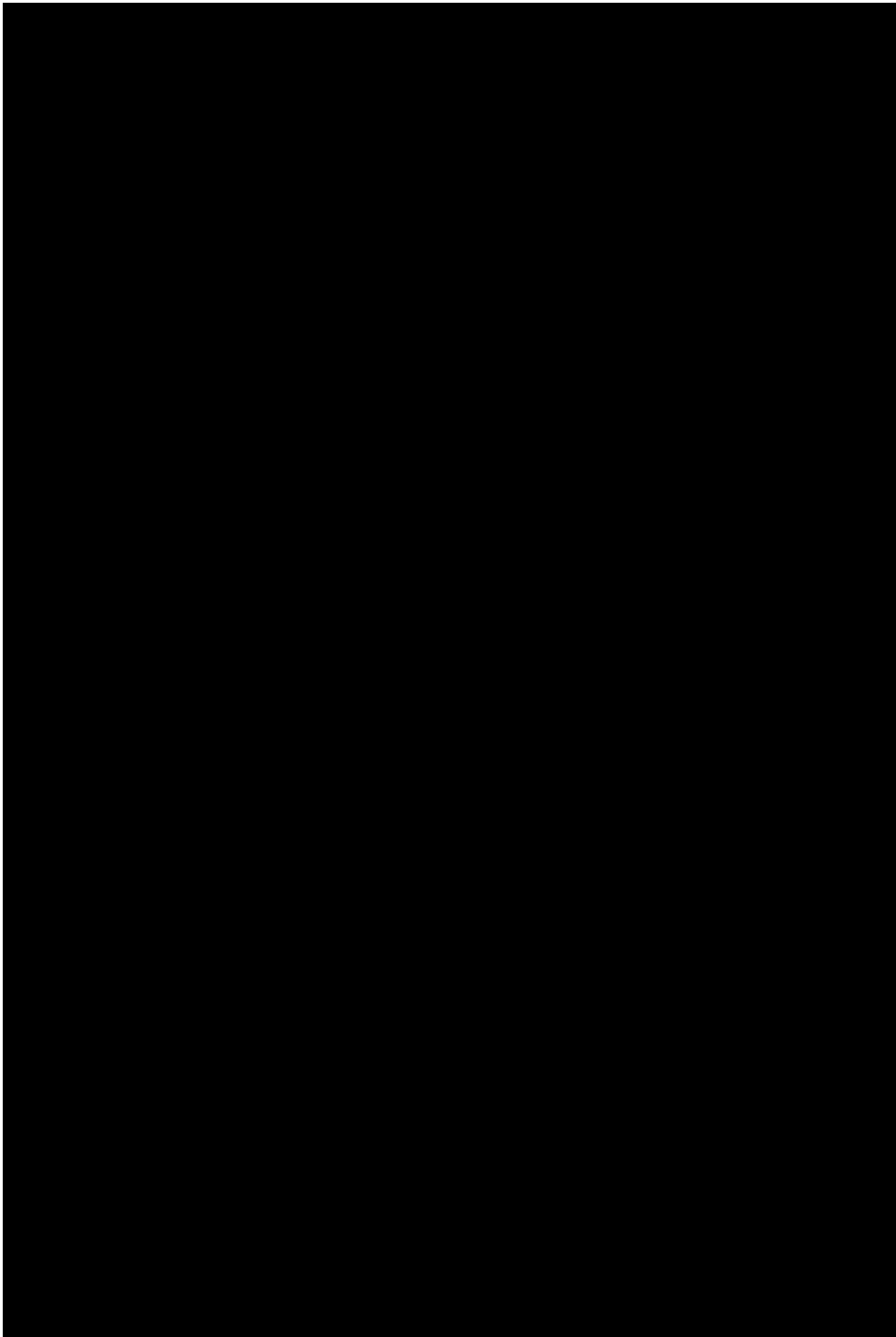


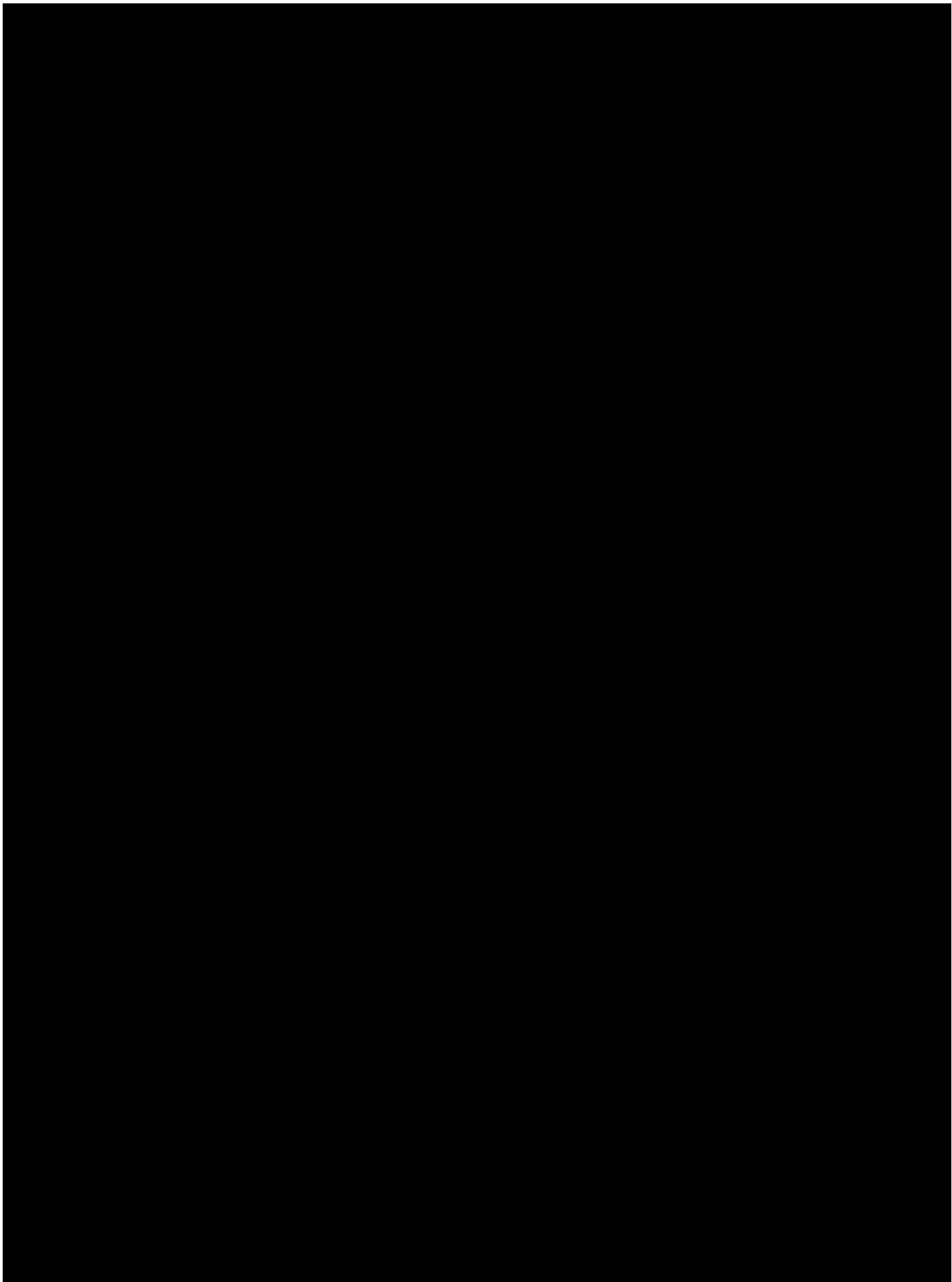


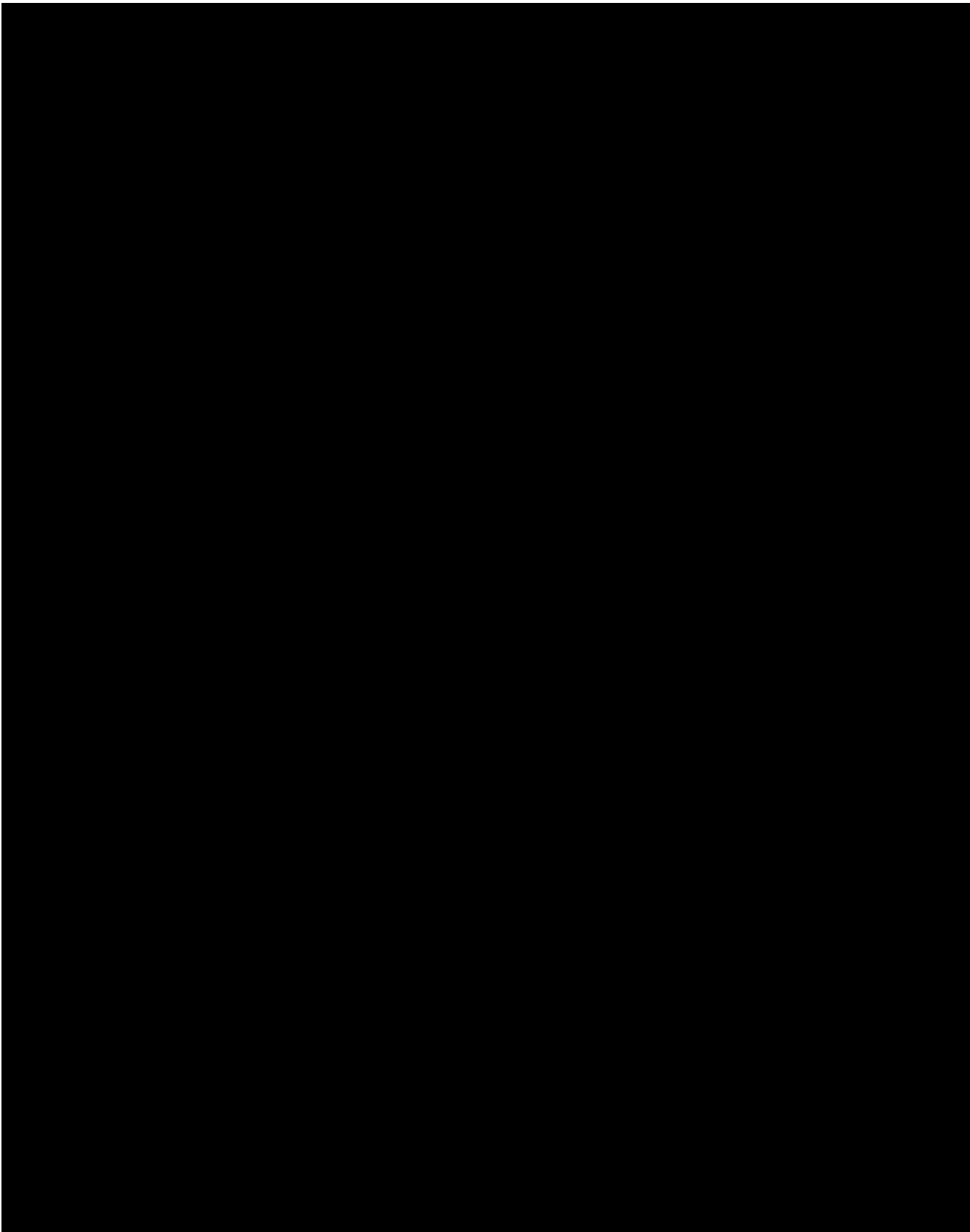


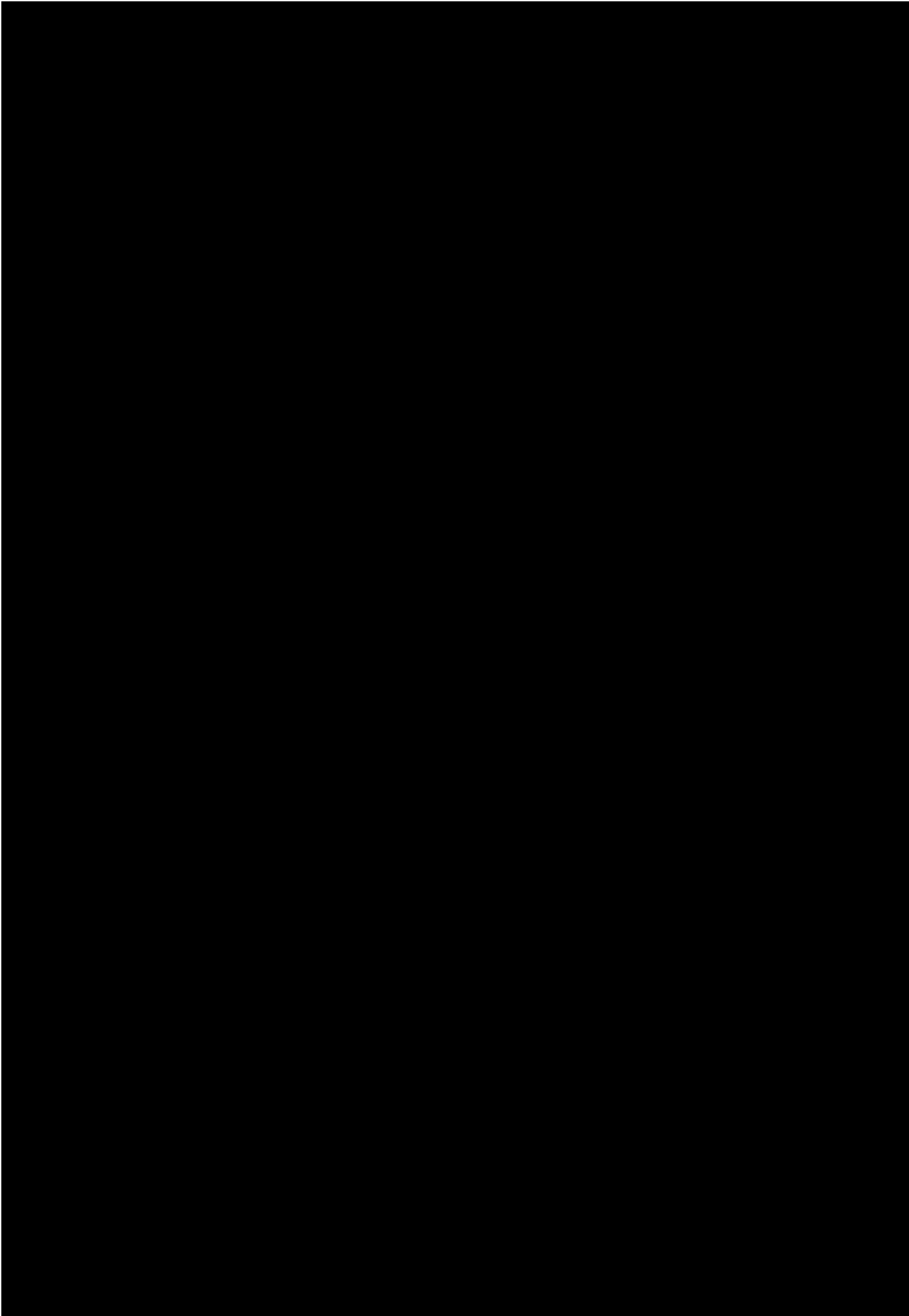


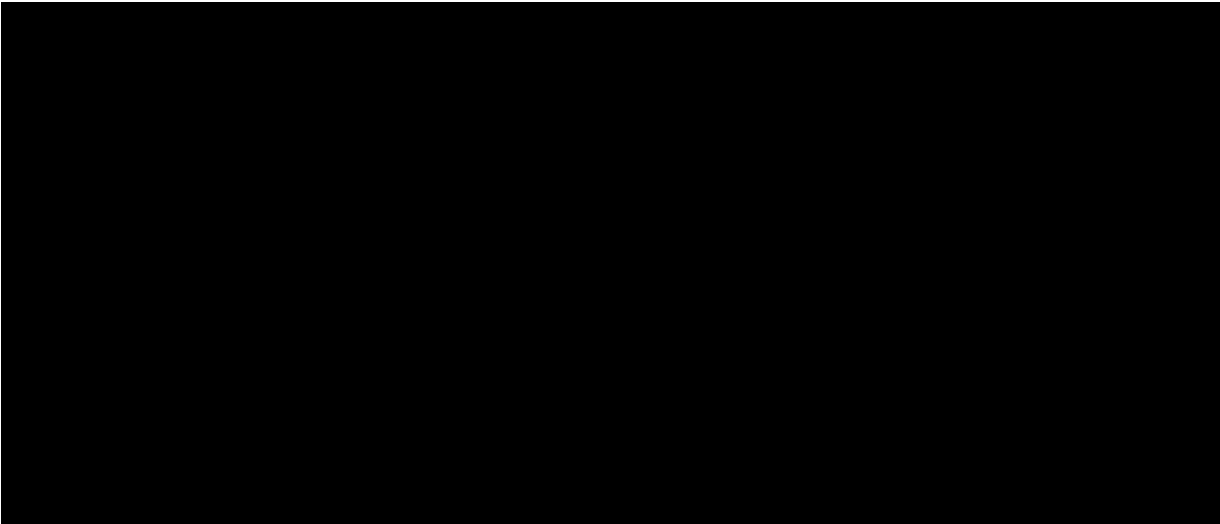


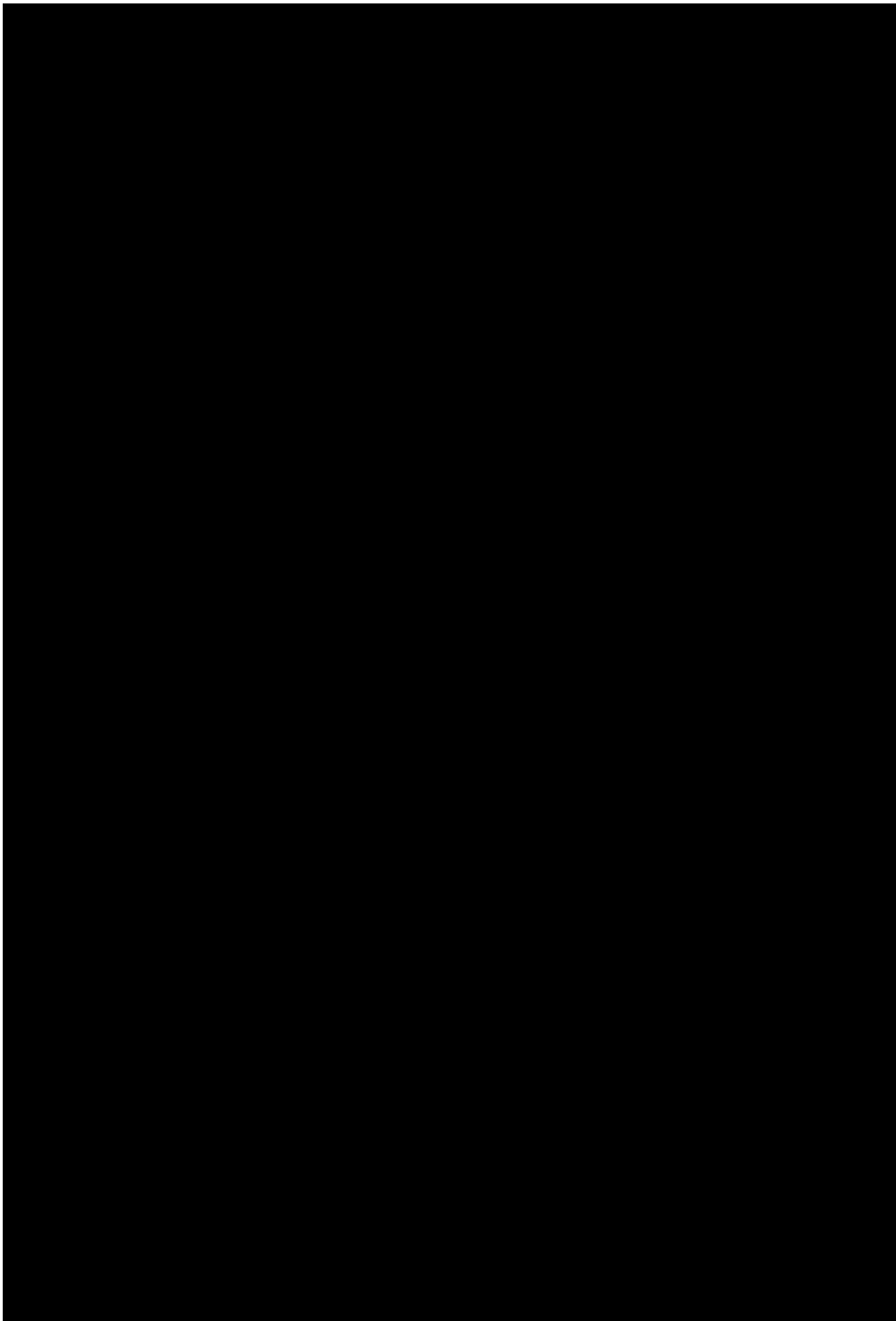


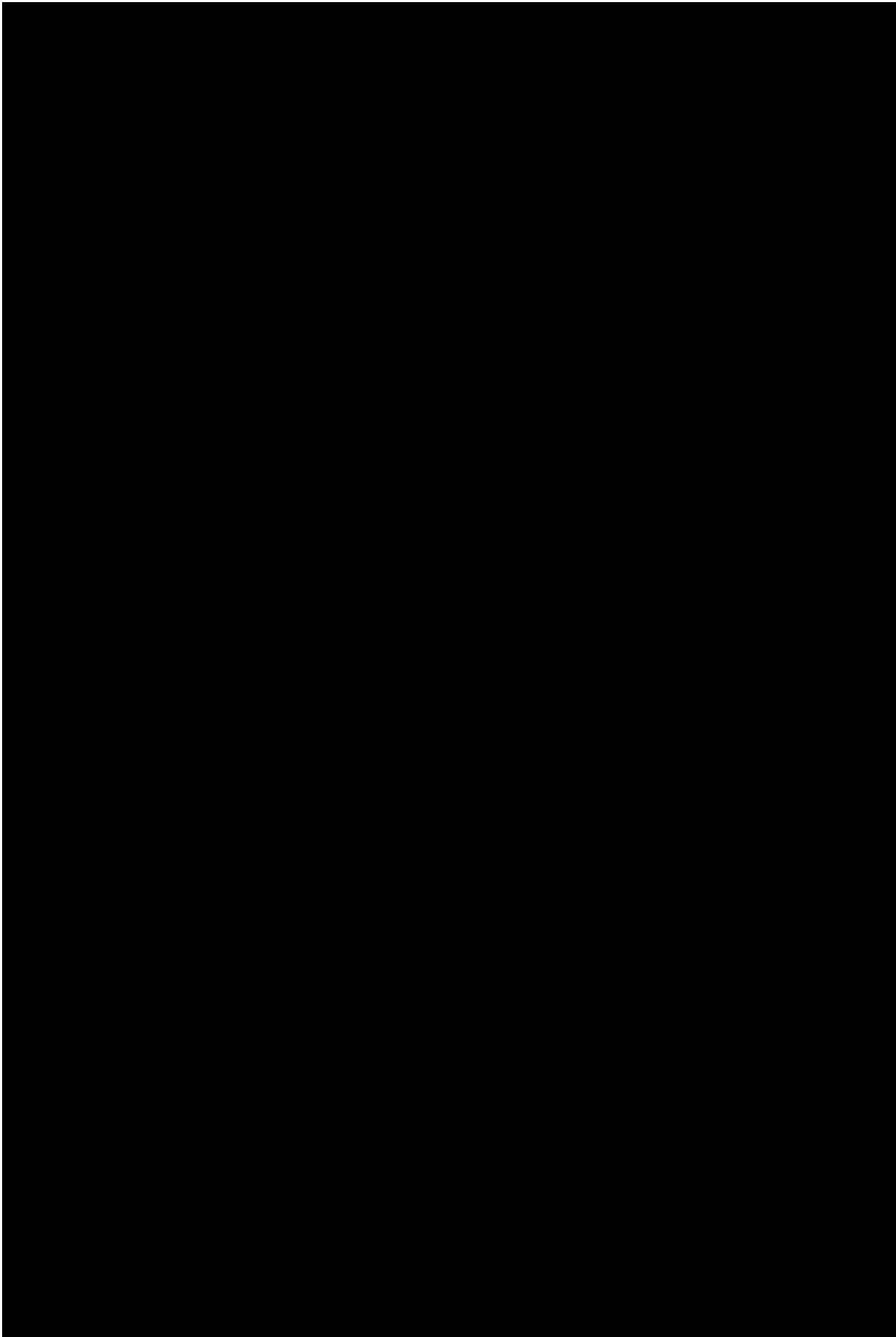


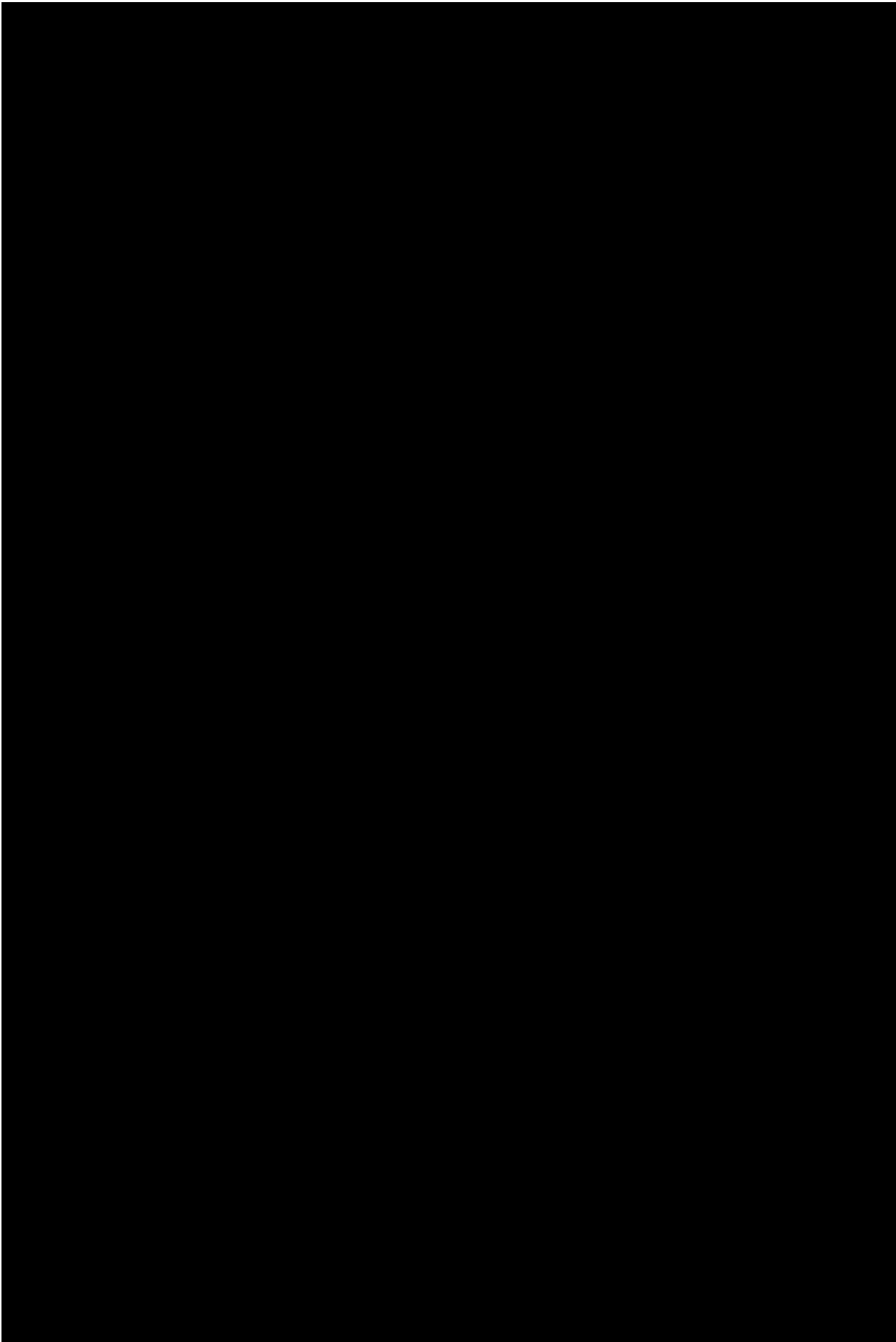


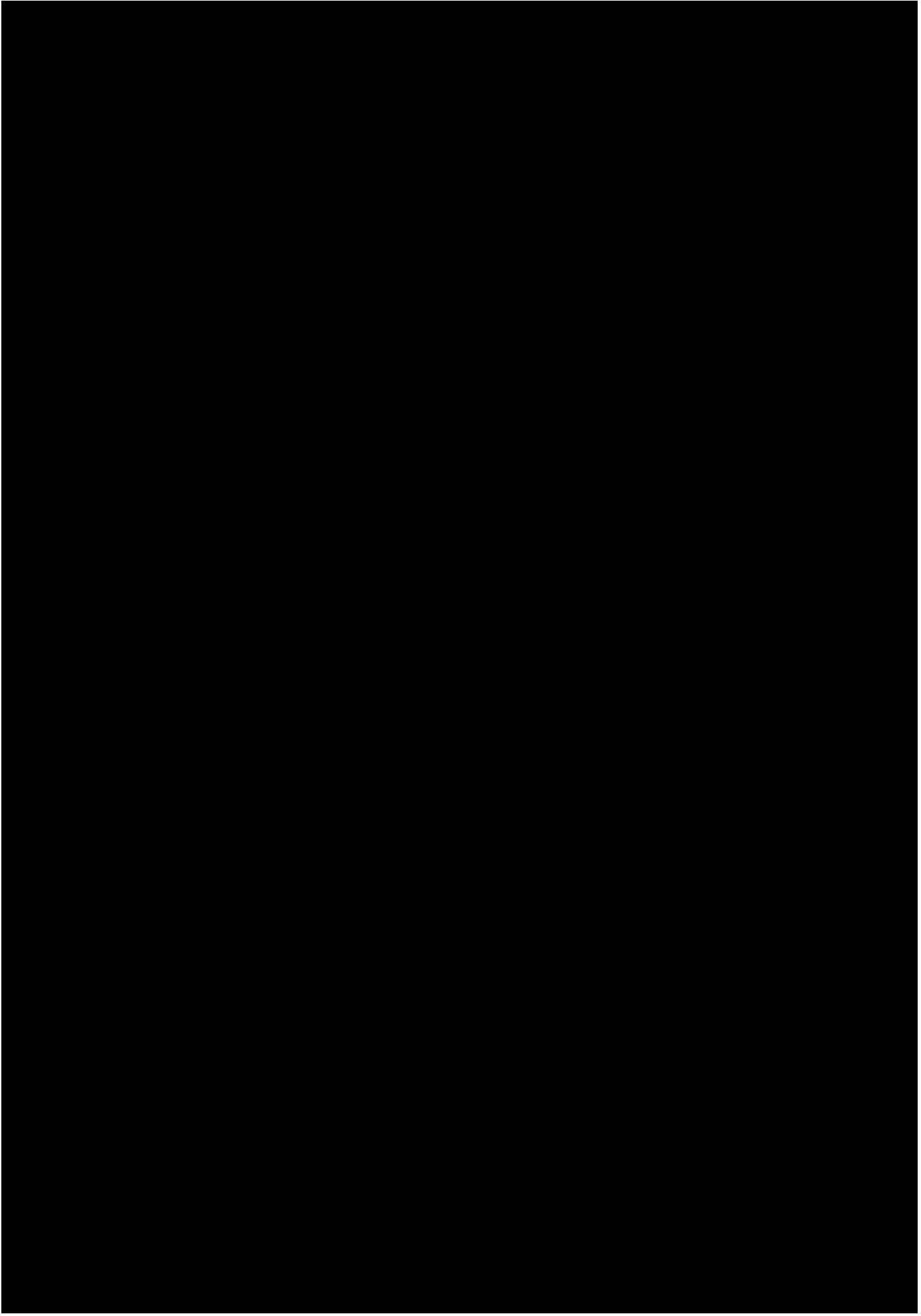


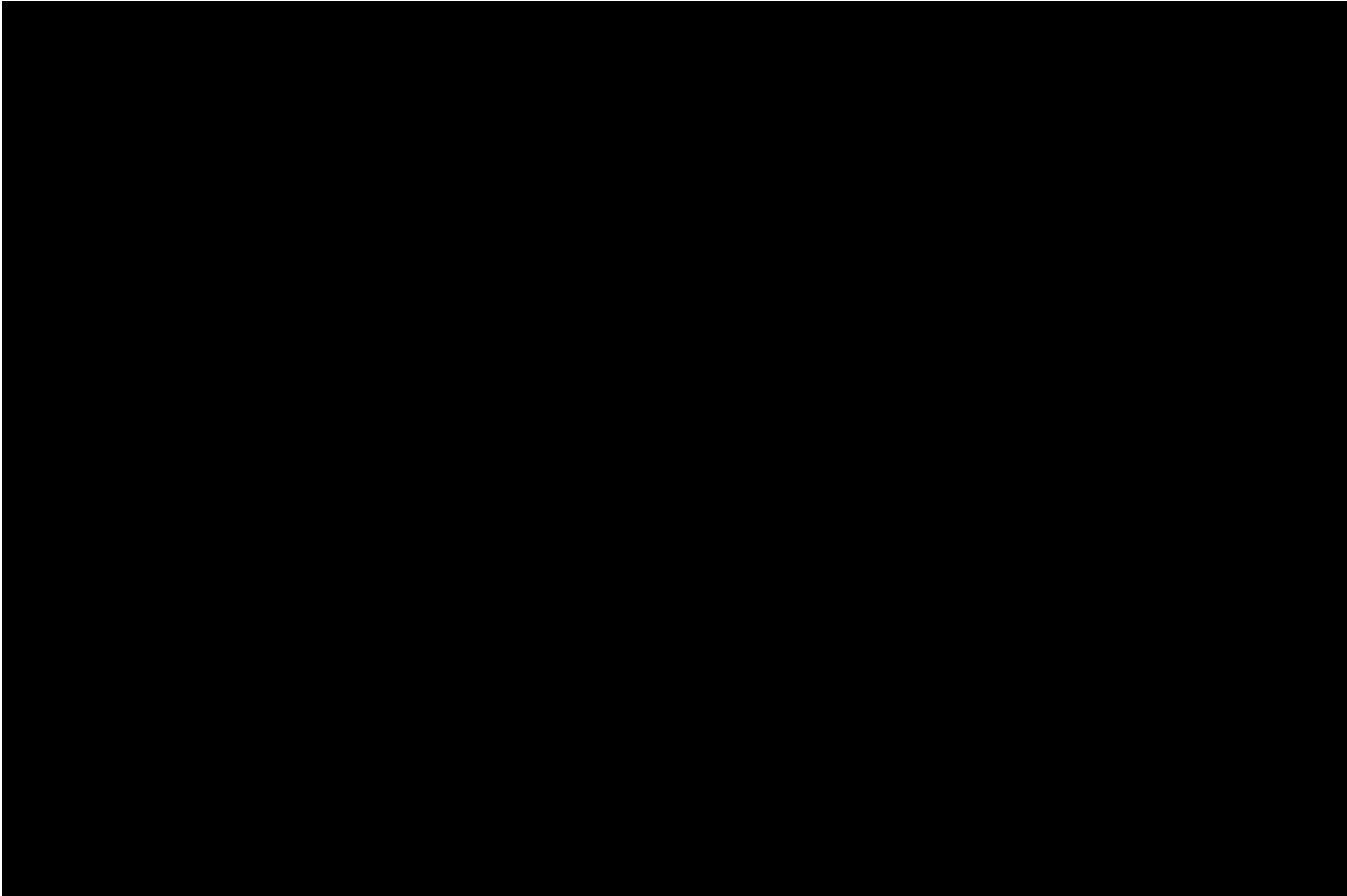


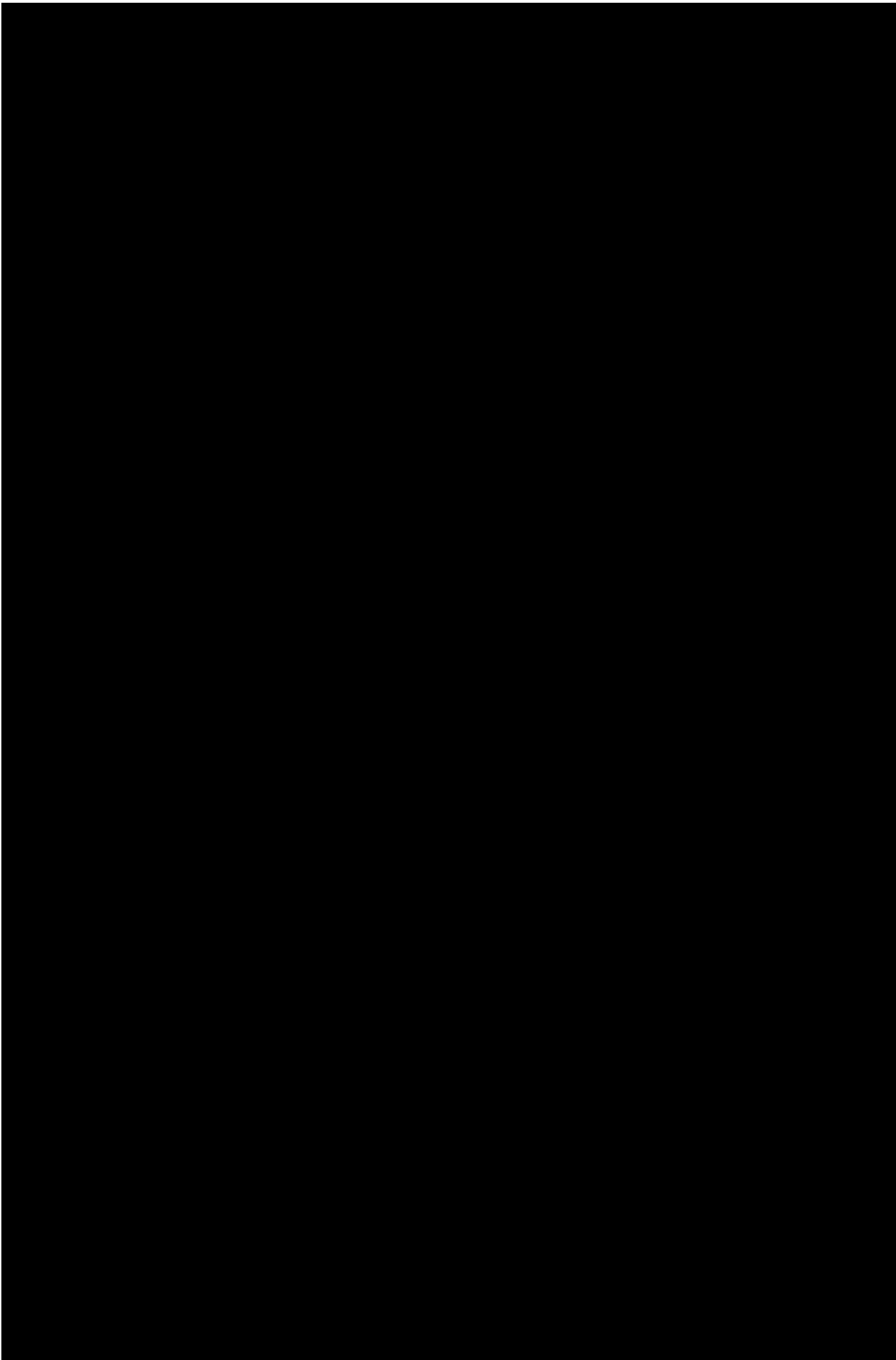


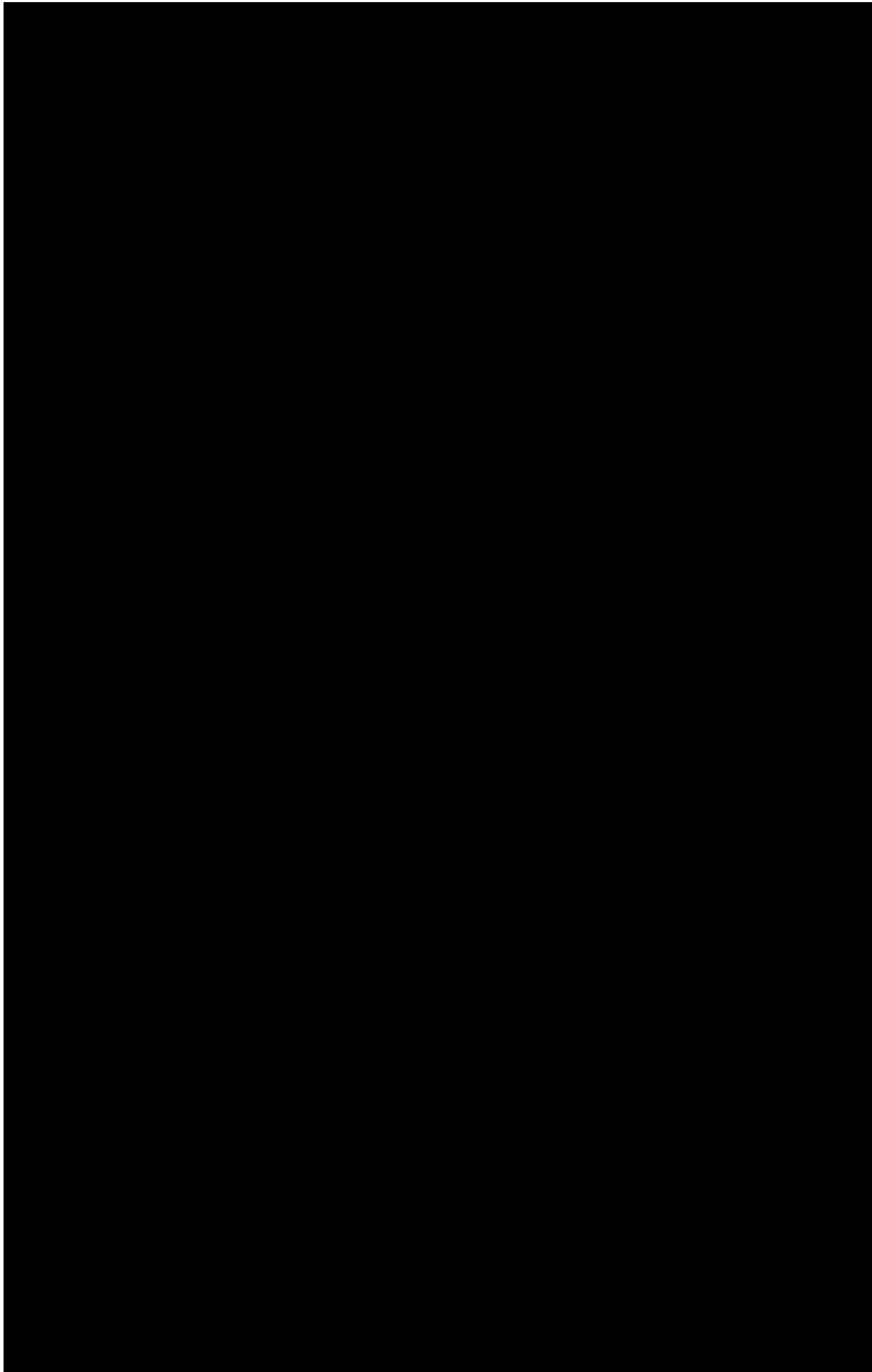


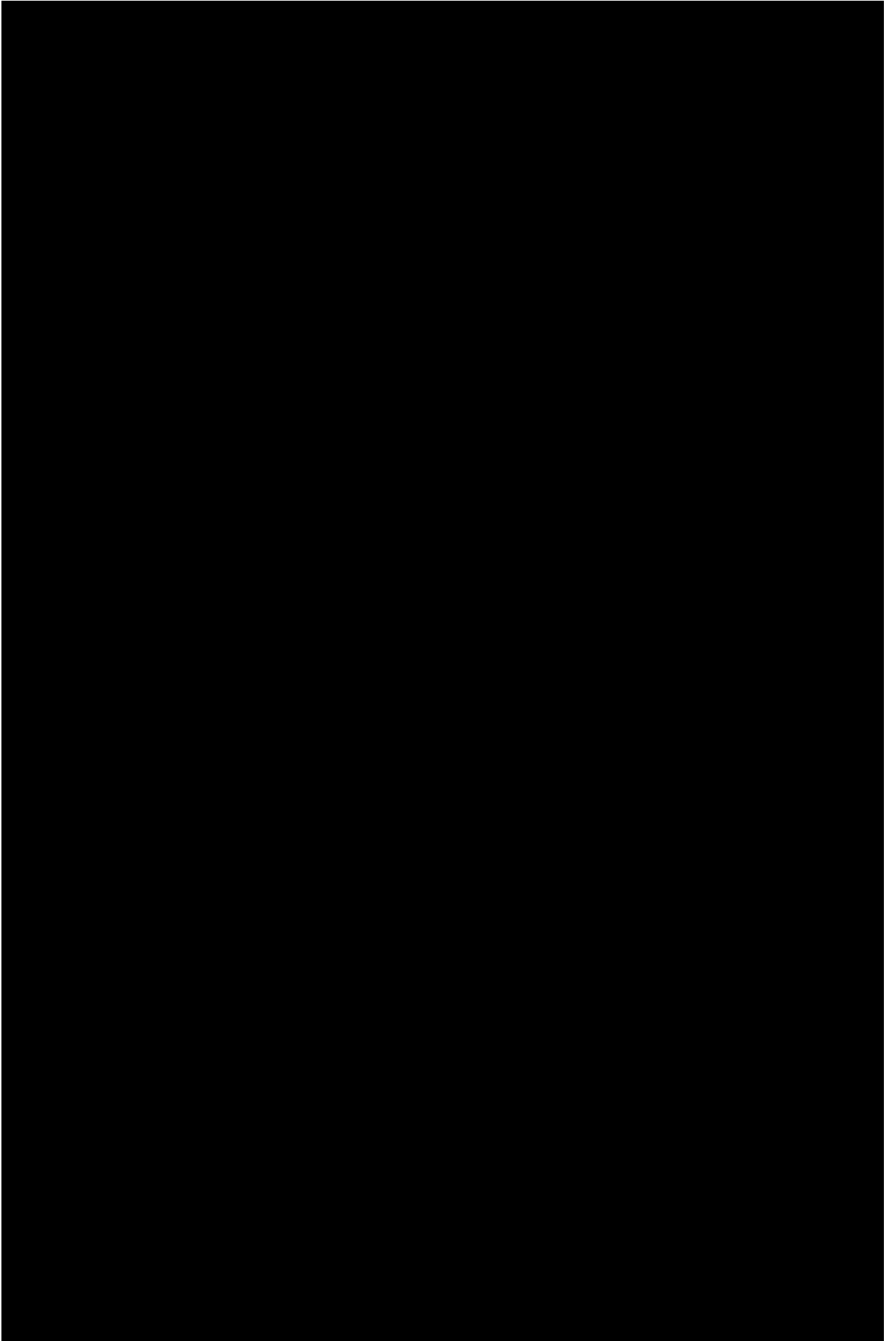


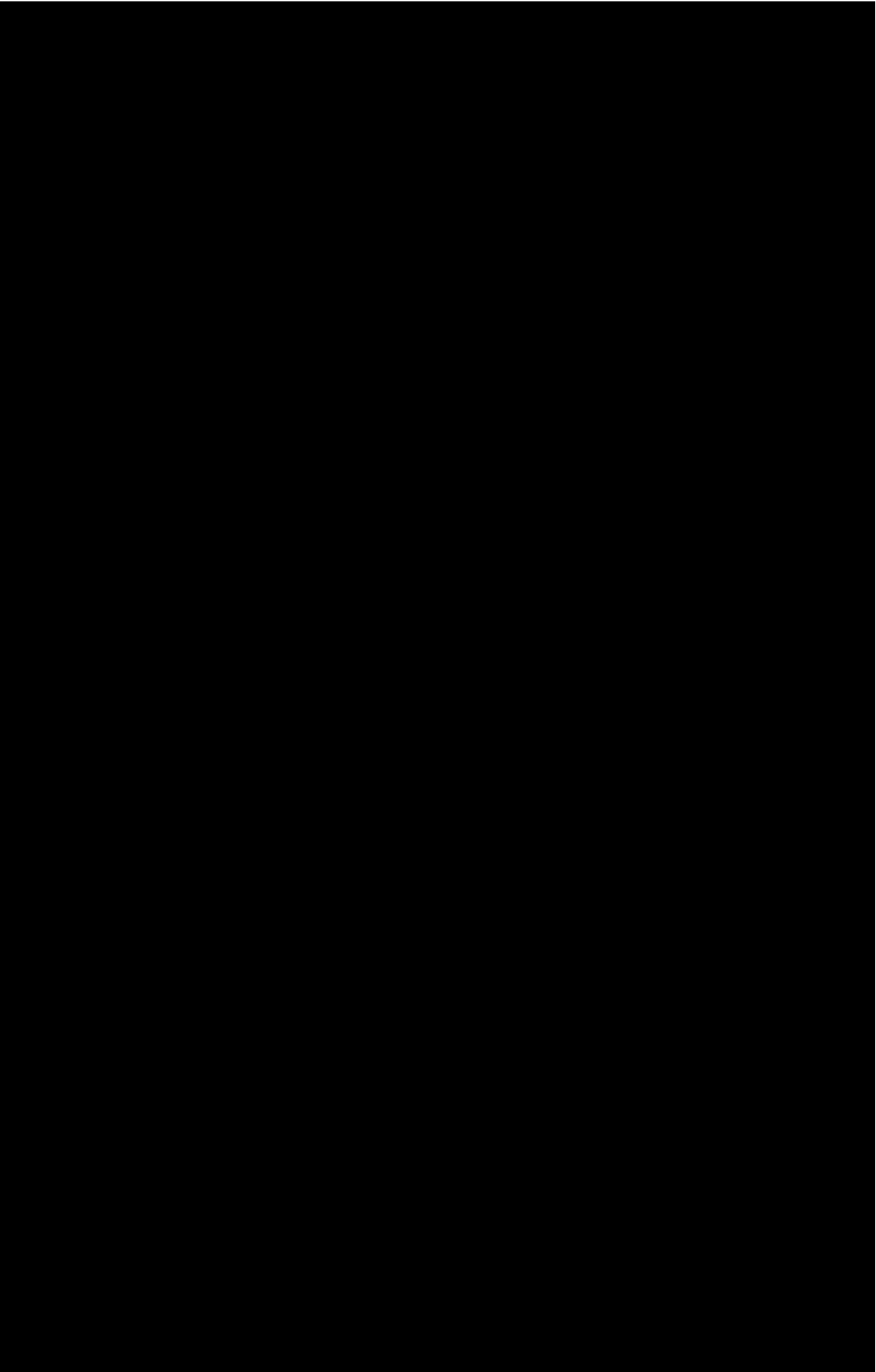


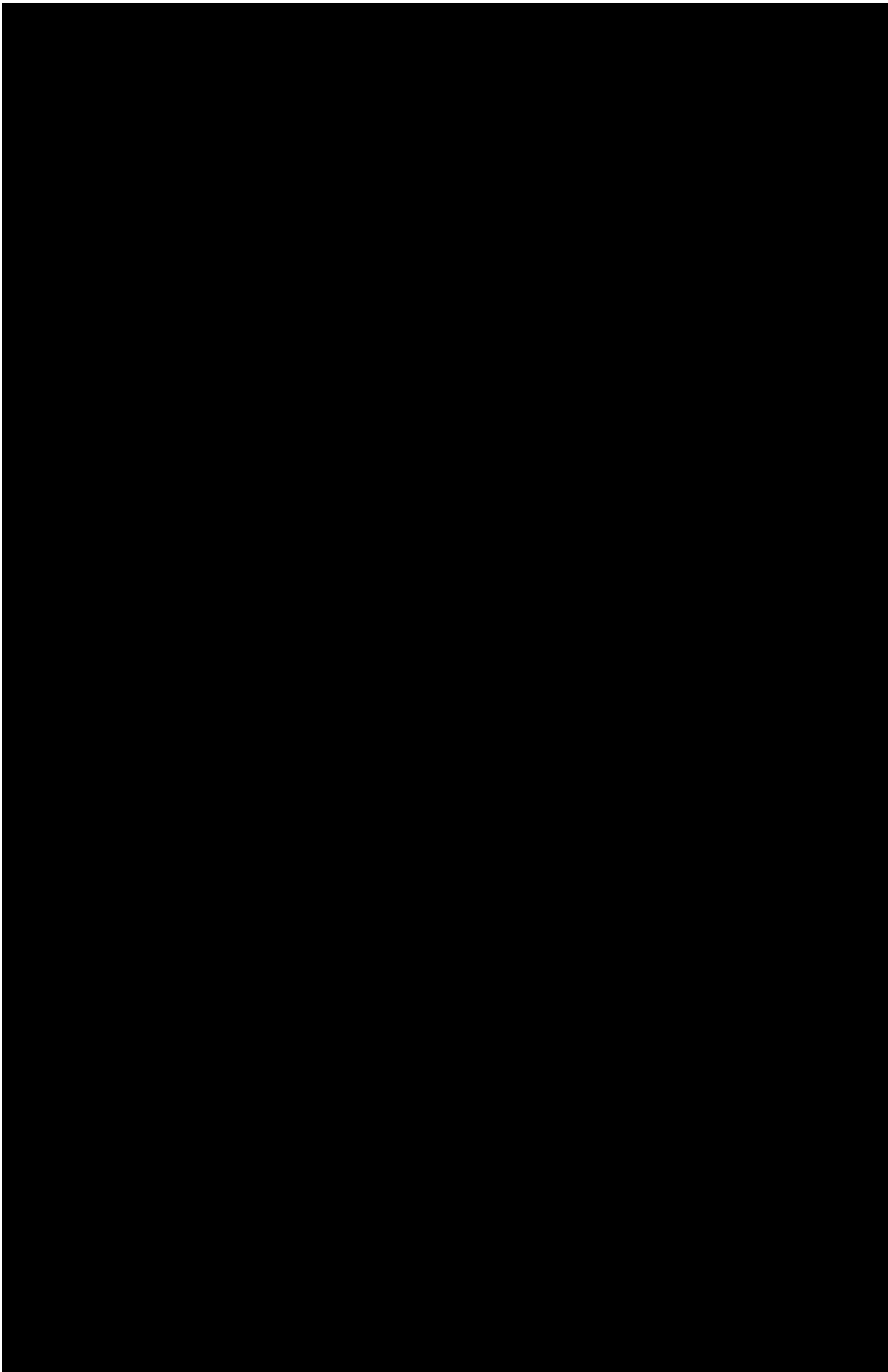




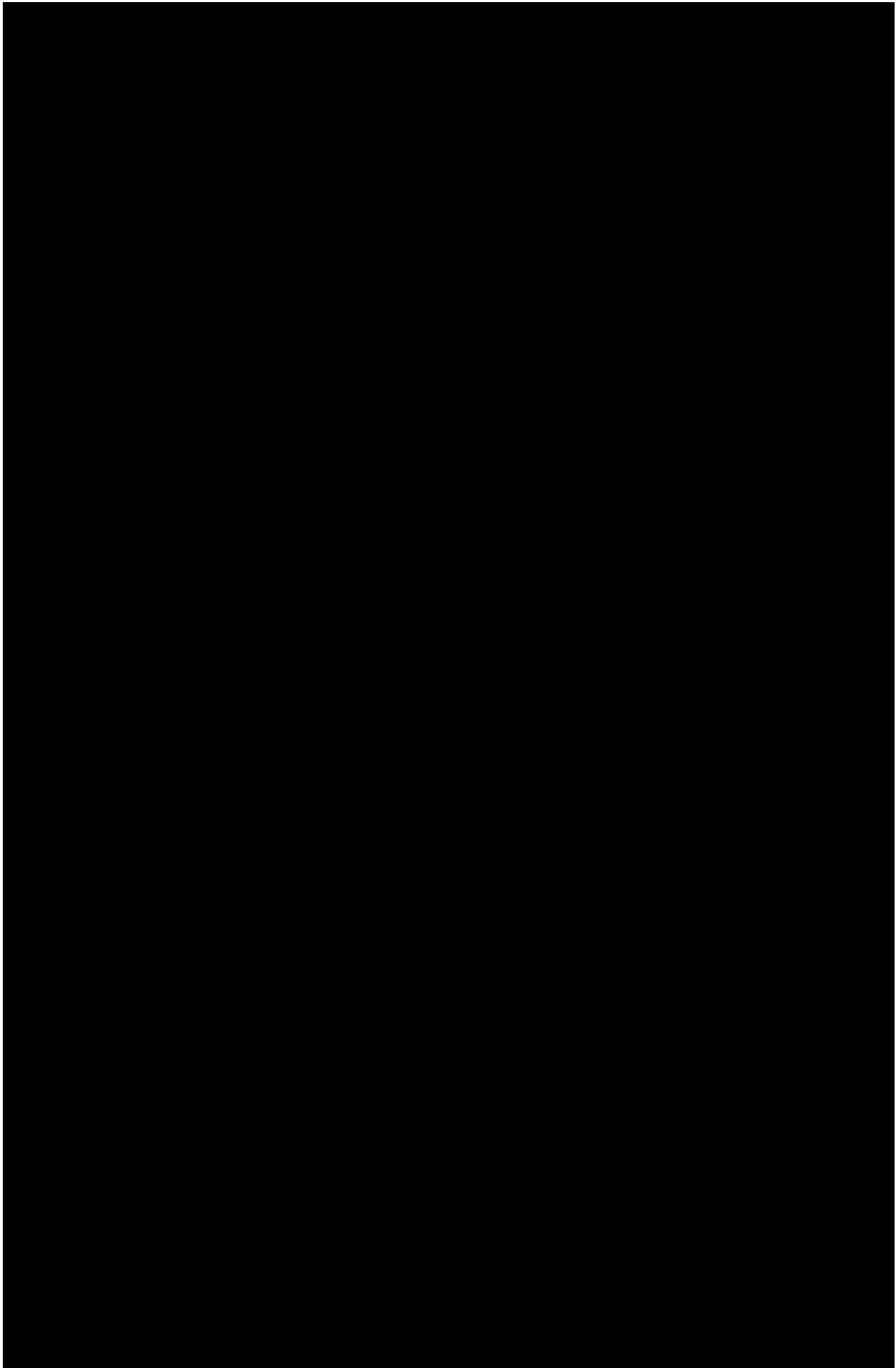


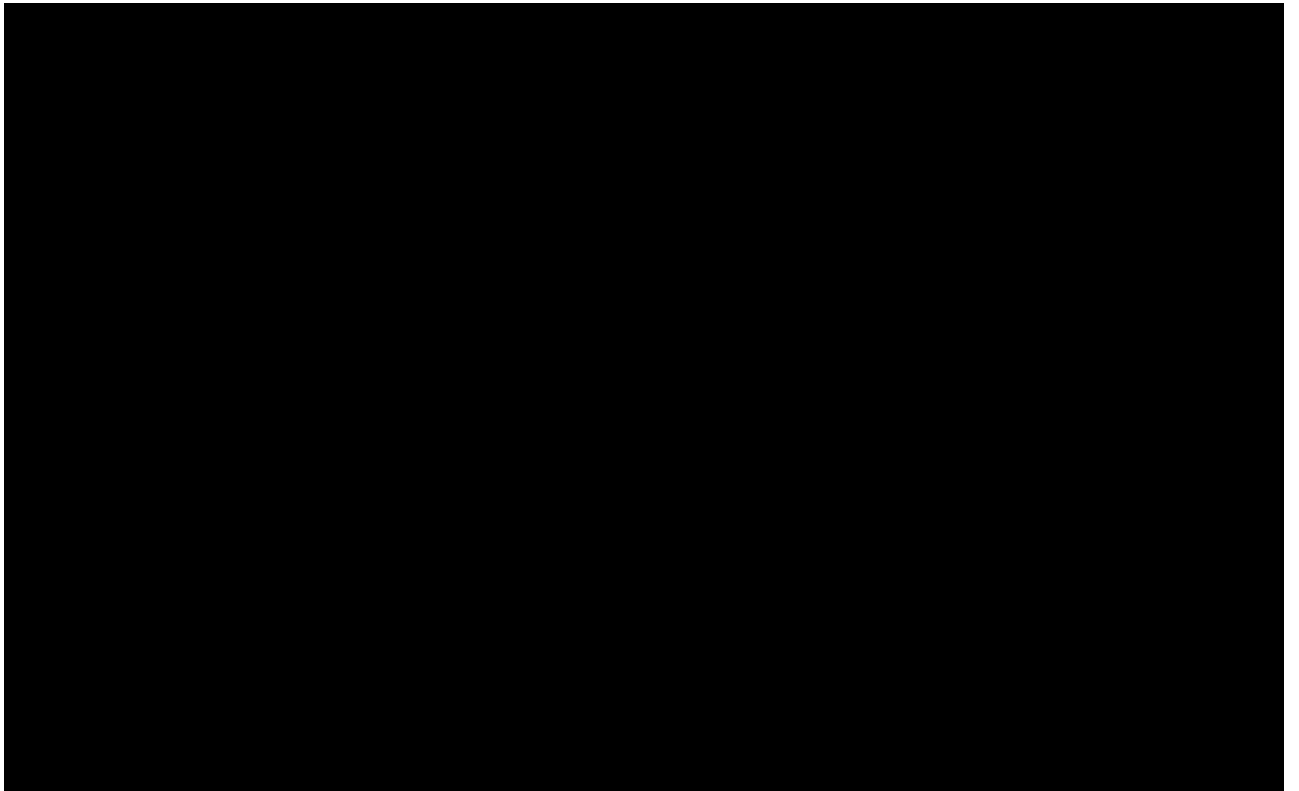












CHAPTER 7 – FEASIBILITY AND ACCEPTABILITY OF A WEB-BASED
TREATMENT WITH TELEPHONE SUPPORT FOR POSTPARTUM WOMEN
WITH ANXIETY: A RANDOMIZED CONTROLLED TRIAL

This chapter has been published as:

Ashford, M. T., Olander, E. K., Rowe, H., Fisher, J. R. W., & Ayers, S. (2018).
Feasibility and acceptability of a web-based treatment with telephone support for
postpartum women with anxiety: A randomized controlled trial. *JMIR Ment Health*,
5(2), e19.

Abstract

Background. Postpartum anxiety can have adverse effects on the mother and child if left untreated. Time constraints and stigma are common barriers to postpartum treatment. Web-based treatments offer potential flexibility and anonymity. “What Am I Worried About” (WaWa) is a self-guided treatment based on cognitive-behavioural and mindfulness principles for women experiencing postpartum anxiety. WaWa was developed in Australia and consists of nine modules with optional weekly telephone support. WaWa was adapted to a web-based version for the use in England (iWaWa).

Objectives. This study’s main aims were to investigate the feasibility (engagement and usability) and acceptability (usefulness, satisfaction, and helpfulness) of iWaWa among English postpartum women with anxiety.

Methods. Postpartum (<12 months) women with mild to severe anxiety were recruited via social media during an 8-week period. Eligible participants were randomised to the iWaWa treatment group or the wait-list control group. Treatment and study feasibility and acceptability were assessed 8-weeks post-randomisation and anxiety symptoms were assessed at baseline, 8-weeks post-randomisation and 12-weeks post-randomisation using online questionnaires. Semi-structured telephone interviews were carried out after the treatment period for a more in-depth exploration of treatment acceptability and feasibility.

Results. Eighty-nine eligible women were recruited through social media and randomised into the treatment ($n = 46$) or wait-list control group ($n = 43$). Women were predominantly White/Caucasian, well-educated, married, on maternity leave, first-time mothers and reported moderate levels of anxiety. Drop-out rates were high, especially in the treatment group (treatment: 82.60%, $n = 38$; waitlist-control: 51.16%, $n = 22$). Twenty-six women started iWaWa with only two women completing all nine modules. Quantitative and qualitative data suggest iWaWa was experienced as generally useful and helpful. Participants enjoyed iWaWa’s accessibility, anonymity and weekly reminders, as well as the introduction to the principles of cognitive-behavioural therapy and mindfulness. However, iWaWa was also experienced as not user-friendly enough, too long and not smartphone-friendly. Parts of the content were experienced as not always relevant and appropriate. Participants felt that iWaWa could be improved by having a smartphone app format and by making the content more concise and inclusive of different parenting styles.

Conclusions. Despite interest in iWaWa, the results suggest that both the study and iWaWa were not feasible in the current format. However, this first trial provides useful evidence about treatment format and content preferences which can inform iWaWa's future development, as well as research and development of web-based postpartum anxiety treatments in general to optimise adherence.

Introduction

Anxiety disorders such as generalised anxiety disorder, obsessive compulsive disorder, panic disorder and phobias in the first year after birth (postpartum) are common with prevalence rates ranging between 9.9-20% (Dennis et al., 2017; Howard, Piot, et al., 2014; Leach et al., 2015). Anxieties in the postpartum period are often life-stage specific, for example worries about baby's care and health, as well as fear of criticism and inadequacy as a mother (Rowe et al., 2014). Postpartum anxiety disorders can either be a reoccurrence of a previous disorder or develop as a first episode. Symptom intensity and associated degree of impairment of these anxiety disorders can vary over the course of the postpartum period (O'Hara & Wisner, 2014). Despite available effective treatments (Dennis & Hodnett, 2007; Dennis, 2005; Misri et al., 2015; Misri & Kendrick, 2007; Sockol et al., 2011), postpartum mental health problems often go undetected or untreated (Bauer et al., 2014; Goodman & Tyer-Viola, 2010). Low screening and diagnosis rates play a role, but some women with emotional difficulties postpartum can be more reluctant to disclose and seek help (Button et al., 2017; Prevatt & Desmarais, in press; Woolhouse et al., 2009). Possible reasons for this include "being too busy to get around to seeking help" and "feeling too embarrassed or having no-one they felt comfortable talking to" (p. 80) (Woolhouse et al., 2009), as well as child care concerns (Goodman, 2009).

The importance of having efficient and timely treatments is highlighted by the adverse effects of untreated mental health problems on the physical and psychological health of the mother, child and family (Glasheen et al., 2010; Stein et al., 2014), as well as potential costs to society (Bauer et al., 2016). For example, it has been shown that maternal anxiety can affect infant bonding and feeding (Fallon, Groves, Halford, Bennett, & Harrold, 2016; Tietz et al., 2014) and may negatively affect the child's somatic health (Glasheen et al., 2010). Considering the importance of treatment and unique postpartum barriers to accessing treatment, providing convenient and anonymous treatment seems essential.

One approach of offering anonymous and convenient treatment are web-based self-help treatments, which run on computers, tablets, or smartphones and allow individuals to work through written therapy material without or with minimal therapist or mental health professionals' assistance. Many of today's parents search for information and support online (Dworkin et al., 2013). In addition, postpartum women who feel isolated or restricted by their baby's schedule experience online resources as

useful (McDaniel et al., 2012). In a thematic analysis of motivators and barriers to an Internet-based postpartum depression treatment it was found that the offered flexibility and anonymity fitted women's postpartum circumstances (O'Mahen et al., 2015). This suggests that web-based treatments may be an appropriate alternative or supplement to conventional face-to-face therapy for postpartum women.

Systematic reviews and one meta-analysis focussing on the perinatal period suggest that web-based treatments can help improve postpartum depressive symptoms (Ashford et al., 2016 - Chapter 2; Lau et al., 2017; Lee et al., 2016), but so far none are specifically developed for postpartum anxiety (Ashford et al., 2016 - Chapter 2). An online survey demonstrated that women with postpartum anxiety are interested in web-based treatments (Ashford, Ayers, & Olander, 2017 - Chapter 6) and a qualitative study of postpartum health care professionals (health visitors) in the UK reported a need for more treatment options for postpartum anxiety and that web-based treatments could be useful to address this issue (Ashford, Olander, Rowe, Fisher, & Ayers, 2017 - Chapter 5).

Based on the identified interest and need, a self-help treatment for women experiencing low or moderate symptoms of postpartum generalised anxiety disorder (What Am I Worried About (WaWa)) developed in Australia (Rowe et al., 2014), was transformed into a web-based version called iWaWa (Internet-based WaWa). This study aimed to evaluate the feasibility and acceptability of iWaWa for women with postpartum anxiety problems in England. Based on the stage model of behavioural therapy research (Onken et al., 1997; Rounsaville et al., 2006), the primary study objectives were to (i) determine study feasibility by examining recruitment and attrition, (ii) examine iWaWa's feasibility in terms of engagement and usability and (iii) examine user's acceptability of iWaWa in terms of usefulness, helpfulness and satisfaction. The secondary objective was to (iv) examine potential changes in anxiety over the course of the treatment and compared to a wait-list control group.

Methods

The study received ethical approval from the NRES London-Dulwich Research Ethics Committee (ref: 15/LO/1827) (see Appendix 7.1).

Sample and Recruitment

Sample size calculation. Studies evaluating feasibility of web-based treatments for postpartum depression have recruited between 53 to 103 participants in total

(Danaher et al., 2013; Haga et al., 2013). A power calculation indicated that 27 participants in each group would be required to achieve 95% power at a one-sided 5% significance level. Studies evaluating postpartum depression web-based treatments had attrition rates between 11.3%-62.3%, with an average attrition of 34.2% (Danaher et al., 2013; O'Mahen et al., 2013, 2014). About 18 more participants should be recruited to allow for 34.2% attrition. It was therefore aimed for a minimum of 36 participants per group (treatment and wait-list control) (total = 72).

Recruitment. Participants ($n = 89$) were recruited over eight weeks (March-May 2017) online through Facebook, Twitter and appropriate UK third-party parenthood websites, as well as through posters and flyers in two clinical settings in England (hospital and health visiting clinic). The development of the promotion material was informed by mothers participating in patient and public involvement meetings. Monetary compensation was offered for taking part in the follow-up interviews.

Eligibility criteria. Eligible participants had to have given birth in the last twelve months, be aged over 18, live in England, able to read and write English, have Internet access, and a score of ≥ 5 on the Generalized Anxiety Disorder Scale (GAD-7) (Spitzer et al., 2006). Women were excluded if they were receiving formal psychological treatment at the start of the study, reported self-harm or suicidal ideation or had a stillbirth or the baby was seriously ill.

The Online Treatment (iWaWa)

Origin and format. iWaWa is based on the What Am I Worried About (WaWa) self-help booklet for postpartum generalised anxiety disorder (Rowe et al., 2014). A licensing agreement with Monash University allowed researchers at City, University of London to develop a web-based version of WaWa for the use in England in collaboration with the WaWa development team in Australia.

WaWa is based on cognitive-behavioural and mindfulness principles and consists of three sections: 1) Is this for me? 2) Practice 3) Understanding. In the first section, concepts such as generalised anxiety disorder, common worries during the perinatal period, and CBT and mindfulness models are explained, and the program is outlined. The section on 'Practice' consists of seven worksheet modules which target life stage-specific anxieties/worries using guided activities. The last section provides background information about the biopsychosocial model of anxiety and a lay language

description of CBT and mindfulness theories and practice. For more detailed information about the WaWa program, please refer to Rowe et al. (2014).

iWaWa format. iWaWa, the web-based WaWa version, was developed on and hosted by the Qualtrics Platform and a City, University of London blog. For the web-based format, the three main sections were divided up into nine modules (one ‘Is this for me?’ module; seven ‘Practice’ modules; one ‘Understanding’ module). A link to each module could be found on a password-protected blog page of the iWaWa study website (<https://blogs.city.ac.uk/iwawa/the-iwawa-program/>). See Appendix 7.2 for two images of iWaWa. Sessions were made up of multimedia presentations (text, images, audio) and online interactive material (e.g. text boxes, self-assessment with sliders, hot spot graphics).

Participants were advised to start with the first module, but were free to access the remaining modules in any order and as many times as they wished. iWaWa users were also offered optional weekly email and/or text-message reminders and weekly 30-minute telephone support with each practice module. The iWaWa coach was a health psychology PhD student with an MSc in clinical psychology (M.A.). An adapted version of the WaWa Health Professional’s Guide was developed, which included checklists to record fidelity of program implementation, and participant understanding and progress. No changes were made to iWaWa after the trial started.

Study Design and Procedure

Design. Figure 7.1 illustrates the study design and procedures including data collection time-points and measures. A 2 (groups) by 3 (time-points) randomised controlled trial was carried out. Using a blocked randomisation design (generated online), the participants were randomly allocated to an iWaWa treatment group or a wait-list control group. Data were collected at baseline, throughout the treatment, 8-weeks post-randomisation and 12-weeks post-randomisation utilizing both quantitative (online questionnaires) and qualitative methods (optional iWaWa module comments and semi-structured interviews).

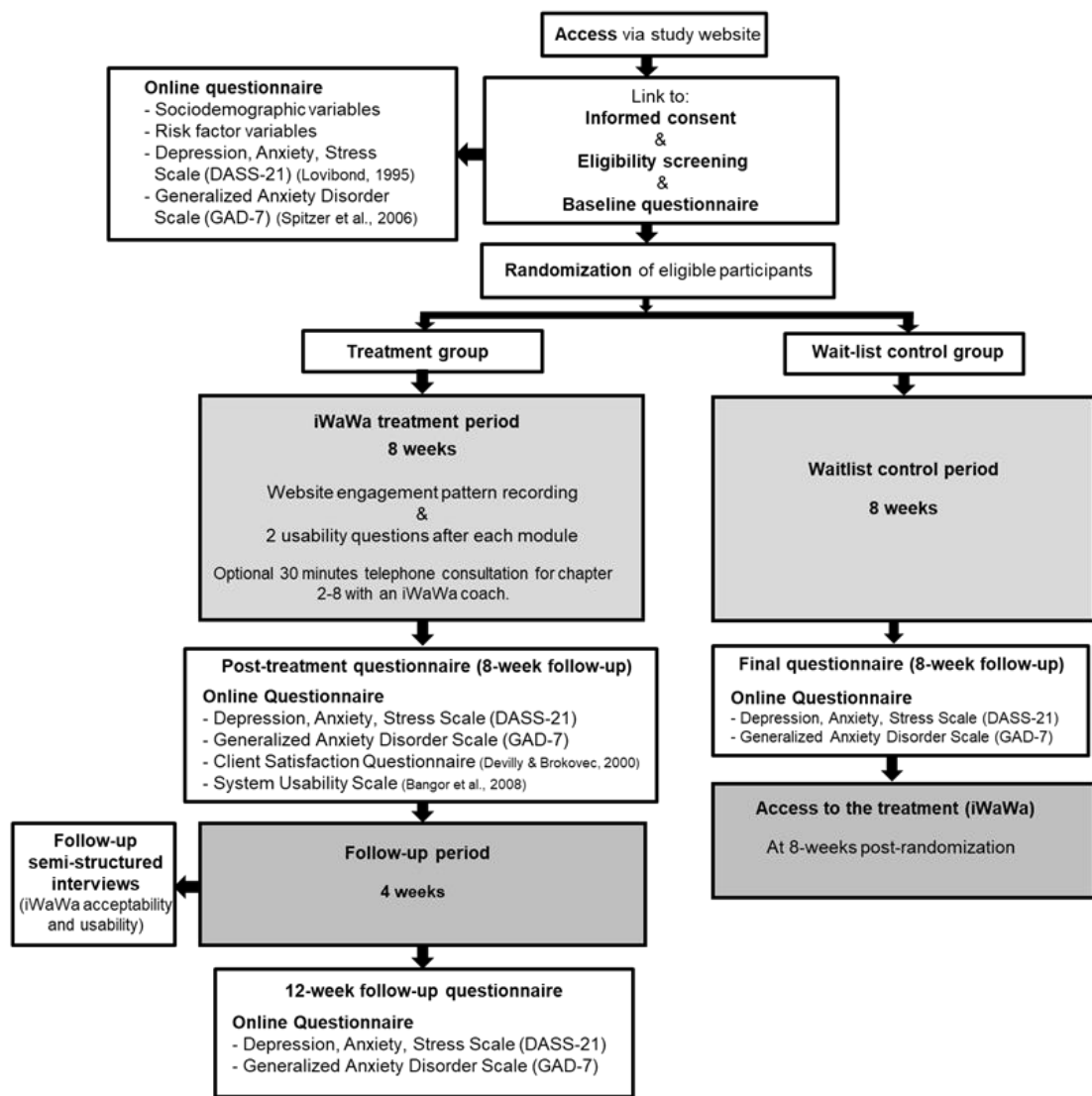


Figure 7.1. Study design and procedure flowchart.

Procedure. The study website contained a link to the online questionnaire consisting of the electronic informed consent procedure, the eligibility questions and the baseline online assessment. Women who were not eligible were provided with links to websites of organisations dealing with postpartum or general mental health problems and advised to contact their general practitioner or health visitor if concerned about their mental health.

Participants were quasi-anonymous. Treatment allocation was revealed to eligible participants via email and participants created a personal identifier for the iWaWa modules and online assessments. The personal identifier was also used to detect participants signing-up multiple times. Treatment group participants were immediately emailed the link and password to the iWaWa program with telephone support. Wait-list control group participants were offered access to iWaWa without

telephone support at 8-weeks post-randomisation. Treatment group participants received one reminder email to start the treatment and all participants received one reminder email for the 8-week and 12-week follow-up assessments. Participants and the researcher responsible for the study management and analysis (M.A.) were not blinded.

Measures

Study feasibility. For study feasibility, the following parameters were recorded: (i) recruitment rate and recruitment source, (ii) eligibility and consent rates, (iii) dropout attrition rates, (v) completeness of data collection and assessment response rates.

Treatment feasibility

Engagement. Module views (module opened) and completion (all pages of the module were viewed), engagement with interactive components and the number and duration iWaWa support calls were recorded. Non-usage attrition rates were calculated.

Usability. Upon completion of each module participants were asked to rate the module's clarity ("This module was clear and understandable.") on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). At the 8-week post-randomisation assessment, the System Usability Scale (SUS) (Bangor, Kortum, & Miller, 2008) was used to determine treatment usability. The SUS is a 10-item instrument rated on 5-point Likert scale (0 = strongly disagree to 4 = strongly agree). The SUS has been found to be highly robust and versatile tool (Bangor et al., 2008) and has previously been used in a study evaluating the feasibility of a web-based treatment for postpartum depression (Danaher et al., 2013). The SUS was adapted by replacing "the system/product" with "iWaWa". Scores are added together and multiplied by 2.5 to convert the original scores to 0-100. A score above a 68 is considered above average and below 68 is considered below average. Participants were also asked to rate how iWaWa fit into their daily routine and potential future usage on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). Participants were further asked to state any technical issues.

Treatment acceptability

Usefulness. At the end of each module, participants were asked to rate the module's usefulness ("I found this module useful") on a 7-point Likert scale (1 =

strongly disagree to 7 = strongly agree). At the 8-week post-randomisation assessment, participants were presented with the statement “I found iWaWa useful” rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Satisfaction. The Client Satisfaction Questionnaire (CSQ-8) (Larsen, Attkisson, Hargreaves, & Nguyen, 1979; Nguyen, Attkisson, & Stegner, 1983) was used to assess treatment satisfaction. The CSQ-8 consists of eight items rated on 5-point Likert scale. The CSQ-8 demonstrated excellent psychometric properties (Attkisson & Zwick, 1982). The CSQ-8 was adapted for this study by substituting “service” with “help” and “program” with “iWaWa”. The overall sum ranges from 8-32 with higher score indicating higher satisfaction.

Helpfulness. The 8-week post-randomisation assessment also included six items developed for this study and were designed to measure perceived helpfulness with anxieties/worries (e.g. “Using iWaWa made it easier to cope with my worries”) on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Mental health. Anxiety was measured using the Generalized Anxiety Disorder Scale (GAD-7) (Spitzer et al., 2006). The GAD-7 is a seven-item anxiety measure and items are rated on a 4-point Likert-scale ranging from ‘0’ (not at all) to ‘3’ (nearly every day). It demonstrated validity and reliability in clinical practice and research (Spitzer et al., 2006). It has been suggested that the GAD-7 is a viable postpartum anxiety screening tool (Pierson et al., 2017).

The Depression, Anxiety, and Stress Scale (DASS-21) (Lovibond, 1995) consists of 21 items rated on a 4-point Likert-scale ranging from 0-3. Higher scores indicate more severe symptoms. The DASS-21 has good internal consistency and concurrent validity (Antony, Bieling, Cox, Enns, & Swinson, 1998; Henry & Crawford, 2005).

Participant characteristics. In line with the CONSORT-EHEALTH checklist (Eysenbach & CONSORT-EHEALTH Group, 2011), demographics relevant to the digital divide, as well as maternity characteristics were collected as part of the baseline questionnaire: age, ethnicity, education, employment, annual household income, relationship status, availability of computer/laptop/tablet/smartphone, number of previous children and time since birth.

Qualitative treatment feasibility and acceptability evaluation

Comments. Participants could write an optional comment about their experience at the end of each iWaWa module and in the follow-up assessments.

Follow-up interviews and survey. All treatment group participants (including drop-outs) were invited to take part in an optional semi-structured phone interview or online survey to collect in-depth information about their treatment experience. Participants gave verbal consent before the start of the interview. Interviews were audio-recorded and conducted by the first author (M.A.) using a semi-structured interview schedule with open-ended questions (see Appendix 7.3). The same questions were used for the online survey for which consent had to be provided electronically. Participants received a £10 Amazon voucher as a compensation for their time.

Data Analysis

Quantitative data. Statistical analyses were performed with SPSS using a $p < .05$ significance level. Descriptive statistics including means, standard deviations, percentages, proportions were used to describe the characteristics of the overall sample and the two conditions, as well as the iWaWa program feasibility and acceptability and study feasibility. Independent t -tests and χ^2 -tests were used to explore whether participant characteristics differed between the groups or between participants who did and did not complete the follow-up assessments.

For the mental health measures group differences and differences over time were analysed using independent and dependent-sample t -tests. Due to the large amount of missing data for the follow-up assessments an intention-to-treat analysis was deemed inappropriate (Hollis & Campbell, 1999) and only the data of those completing the assessments was compared. Two-tailed bivariate correlations were conducted to explore whether there is a relationship between anxiety scores and the variables “weeks postpartum” and “number of children”.

Qualitative Data. The interview recordings were transcribed verbatim with all identifying information removed. Subsequently, the interview transcripts and the comments on the individual chapters were analysed using inductive thematic analysis (Braun & Clarke, 2006). The software Quirkos was used to ensure systematic coding. The analysis identified general themes emerging from the comments and interviews.

Results

Participant Characteristics

Table 7.1 presents detailed information about participant characteristics of all randomised participants; those lost to follow-up and those completing the 8-week follow-up assessment. Participants were predominantly ‘White/Caucasian’ (84/89, 94.4%), married (62/89, 69.7%), living with their partner/husband (79/89, 88.8%) and aged between 22 and 43 years ($M = 32.02$ years, $SD = 4.15$ years). Over half of the women had Bachelor’s degrees or higher and were on maternity leave. Slightly less than half of the women ($n = 38$, 42.70%) had an income below £50,000 and about half ($n = 44$, 49.44%) an income equal or above £50,000. Women were between 1-52 weeks postpartum ($M = 28.58$, $SD = 13.76$) and 71.9% ($n = 64$) were first-time mothers (range 1-5 children ($M = 1.36$, $SD = 0.68$)). The majority of participants reported having access to two or more technological devices ($n = 84$, 94.4%). The two most commonly accessible devices were smartphone ($n = 88$, 98.9%) and laptop ($n = 74$, 83.1%).

There were no significant differences between the treatment and wait-list control groups in demographic characteristics except for relationship status ($p = .03$). No differences were found between participants of the treatment and wait-list group who completed the 8-week follow-up assessment and no differences were found between participants of the treatment and wait-list group who did not complete the 8-week follow-up assessment. There were also no significant demographic differences between treatment group participants who started the iWaWa treatment and those who did not.

Table 7.1

Participant Characteristics of All Randomised Participant, Those Lost to Follow-up and Those Completing The 8-week Follow-up Assessment

Characteristics	All randomised participants			8-week follow-up assessment dropouts		8-week follow-up assessment completers	
	Total (n = 89)	T (n = 46)	WLC (n = 43)	T (n = 38)	WLC (n = 22)	T (n = 8)	WLC (n = 21)
Age (<i>M, SD</i>)	32.02 (4.15)	32.41 (3.55)	31.60 (4.71)	32.16 (3.80)	31.82 (5.30)	33.63 (1.69)	31.38 (4.13)
Number of children (<i>M, SD</i>)	1.36 (0.68)	1.39 (0.77)	1.32 (0.57)	1.37 (0.79)	1.32 (0.58)	1.50 (0.76)	1.22 (0.58)
Ethnicity							
White/Caucasian	84(94.4)	43(93.5)	41(95.3)	35(92.1)	20(90.9)	8(100)	21(100)
Asian	4(4.5)	2(4.3)	2(4.7)	2(5.3)	2(9.1)	0(0)	0(0)
Mixed/Multiple ethnics	1(1.1)	1(2.2)	0(0)	1(2.6)	0(0)	0(0)	0(0)
Highest level of education							
GCSE	4(4.5)	2(4.3)	2(4.7)	2(5.3)	1(4.5)	0(0)	1(4.8)
A-level	18(20.2)	7(15.2)	11(25.6)	7(18.4)	7(31.8)	0(0)	4(19.0)
Bachelor's Degree	38(42.7)	20(43.5)	18(41.9)	18(47.4)	9(40.9)	2(25.0)	9(42.9)
Master's Degree	20(22.5)	12(26.1)	8(18.9)	9(23.7)	4(18.2)	3(37.5)	4(19.0)
Doctorate	4(4.5)	3(6.5)	1(2.3)	1(2.6)	0(0)	2(25.0)	1(4.8)
Other	5(5.5)	2(4.3)	3(7.0)	1(2.6)	1(4.5)	1(12.5)	2(9.5)
Current occupation							
Student	2(2.2)	0(0)	2(4.7)	0(0)	1(4.5)	0(0)	1(4.8)
Employed (full-time/ part-time/self)	25(28.1)	18(39.1)	7(16.3)	16(42.2)	4(18.1)	2(25)	3(14.3)
Housekeeper/ Unemployed	10(11.2)	3(6.5)	7(16.3)	2(5.2)	5(22.7)	1(12.5)	2(9.6)
Maternity leave	48(53.9)	23(50)	25(58.1)	18(47.4)	11(50.0)	5(62.5)	14(66.7)
Other	4(4.5)	2(4.3)	2(4.7)	2(5.3)	1(4.5)	0(0)	1(4.8)
Household income							
<£10,000-£19,999	7(7.9)	2(4.3)	5(11.6)	2(10.5)	3(13.6)	0(0)	2(9.5)
£20,000-£39,999	17(19.1)	10(21.7)	7(16.3)	8(21.1)	4(18.2)	2(25)	3(14.3)
£40,000-£59,999	24(26.9)	14(30.4)	10(23.3)	12(31.6)	4(18.2)	2(25)	6(28.5)
£60,000- £79,999	15(16.9)	9(19.6)	6(14)	7(18.4)	3(13.6)	2(25)	3(14.3)
≥£80,000	19(21.3)	9(19.6)	10(23.3)	7(18.4)	4(18.2)	2(25)	6(28.6)
Prefer not to say	7(7.9)	2(4.3)	5(11.6)	2(10.5)	4(18.2)	0(0)	1(4.8)

Table 7.1
Continued.

Characteristics	All randomised participants			8-week follow-up assessment dropouts		8-week follow-up assessment completers	
	Total (<i>n</i> = 89)	T (<i>n</i> = 46)	WLC (<i>n</i> = 43)	T (<i>n</i> = 38)	WLC (<i>n</i> = 22)	T (<i>n</i> = 8)	WLC (<i>n</i> = 21)
Relationship status							
Single/separated	6(6.7)	2(4.3)	4(9.3)	2(5.3)	2(9)	0(0)	2(9.5)
Married/ In a relationship	82(92.2)	44(95.6)	38(88.4)	36(94.7)	19(86.4)	8(100)	19(90.5)
Prefer not to say	1(1.1)	0(0)	1(2.3)	0(0)	1(4.5)	0(0)	0(0)
Weeks postpartum (<i>M, SD</i>)	28.58 (13.76)	29.70 (13.87)	27.40 (13.70)	30.97 (13.76)	26.50 (15.14)	23.63 (13.65)	28.33 (12.32)

Note. Values are numbers (%) unless stated otherwise.

Study Feasibility

Recruitment. Figure 7.2 presents the CONSORT diagram showing participant flow and attrition through the trial. During the recruitment, 147 women accessed the initial assessment and consented to take part. Fifty-eight (39.5%) were excluded (see Figure 7.2 for exclusion reasons). The remaining 89 (60.5%) were randomised into the treatment (*n* = 46) or wait-list control group (*n* = 43). Of the 89 randomised women, 86 (96.6%) heard about the study from Facebook and three (3.4 %) from friends.

Dropout attrition. Twenty-one of 43 wait-list control participants (48.84%) completed the 8-week follow-up assessment. Eight of 46 (17.39%) treatment group participants responded to the post-treatment (8-week follow-up) assessment (one participant completed only the GAD-7 & DASS-21). There was a significant difference in attrition rates between the groups ($p = .002$). Four of 46 (8.67%) women in the treatment group completed the final (12-week follow-up) assessment. One of the four had not completed the 8-week follow-up assessment.

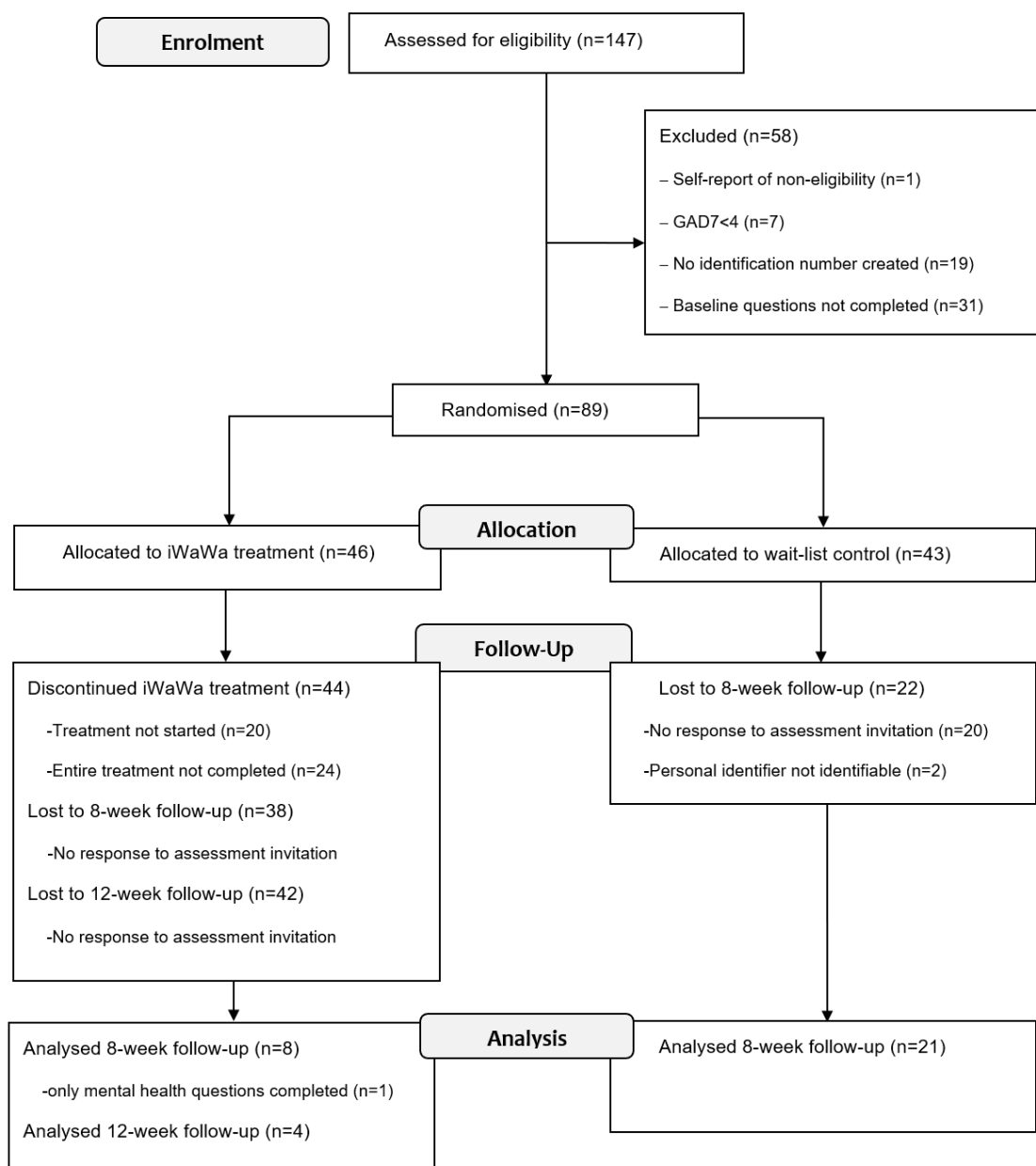


Figure 7.2. Flowchart of participants flow through all trial stages.

Treatment Feasibility

Engagement

iWaWa Modules. Of the 46 treatment group participants, 26 participants (56.52%) viewed at least one module and on average 1.65 modules ($SD = 2.51$) (including repeat views). Two participants viewed all modules (4.34%). Figure 7.3 illustrates the number of module views and completion by the treatment group. Of the 76 modules viewed, 61 (80.26%) were completed. Module 1 was most viewed with a marked reduction thereafter. Engagement with the 14 interactive components within the program ranged from 50%-100% ($M = 69\%$, $SD = 0.17\%$).

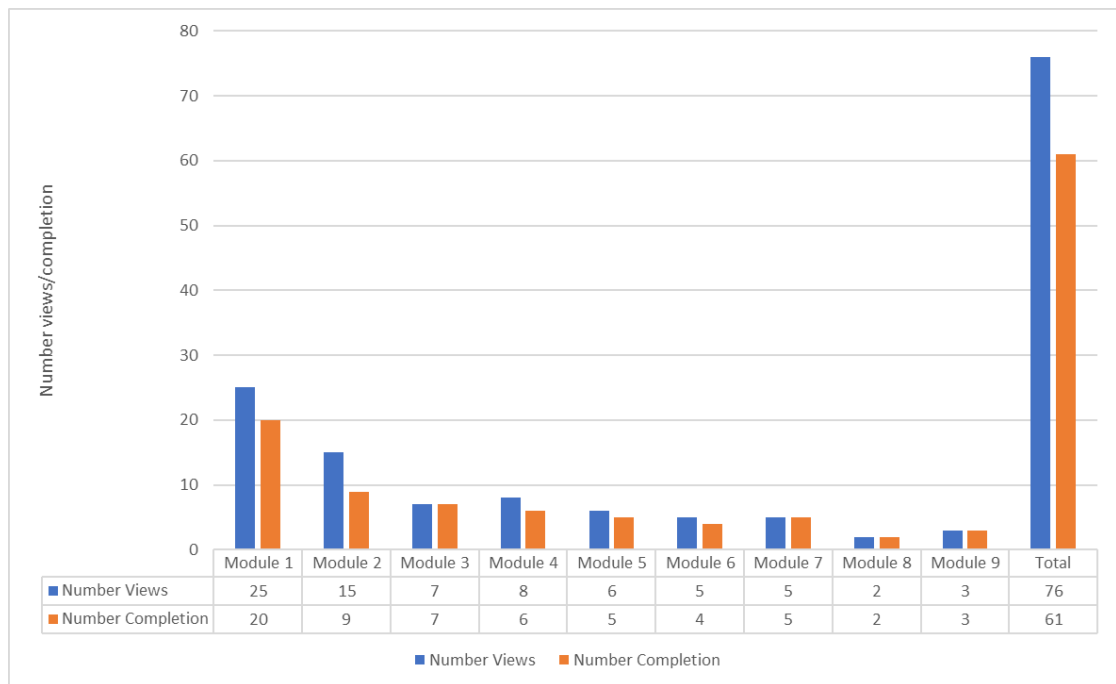


Figure 7.3. Treatment group iWaWa module views and completion.

Email, text and phone support. Of the 25 women in the treatment group accessing Module 1, 24 (96%) signed up for weekly reminders (email: $n = 16$, text: $n = 6$, email & text: $n = 2$). One woman requested a support call, but did not respond when asked about a call date/time.

Usability. The average SUS usability score was 40.00 ($SD = 15.76$; $n = 9$) indicating a usability below average. Module 2 was experienced as least clear and understandable ($M = 4.25$, $SD = 1.75$) and module 1 as most clear and understandable ($M = 6.20$, $SD = 0.62$). Out of eight respondents, five (62.5%) did not agree with the statement that they could use iWaWa seamlessly as part of their daily routine. With the statement regarding regular usage after the study ended two participants disagreed (25%). Regarding technical issues, iWaWa had a two-day down time due to a broken link.

Treatment Acceptability

Usefulness and satisfaction. Module 8 was experienced as least useful ($M = 3.50$, $SD = 2.12$) and module 7 as most useful ($M = 6.00$, $SD = 0.82$). Of the 8-week post-randomisation assessment respondents 71.43% (5/7) rated iWaWa as useful, one rated iWaWa as neither useful nor not useful (14.3%) and one as not useful (14.3%). The average treatment satisfaction CSQ-8 score was 20.22 ($SD = 5.61$) on a range of 8-31.

Helpfulness. Of the seven respondents, 71.43% ($n = 5$) agreed that iWaWa helped them better understand anxiety, 57.14% ($n = 4$) agreed that it helped them develop skills to manage anxiety, 57.14% ($n = 4$) agreed that it helped them manage their unhelpful thoughts, 42.86% ($n = 3$) agreed that it helped reducing distressing bodily sensations, 28.57% ($n = 2$) agreed that it improved their wellbeing and 42.86% ($n = 3$) agreed that it made it easier to cope with their worries.

Qualitative Treatment Feasibility and Acceptability Outcomes

Qualitative data comprised 31 comments from iWaWa modules and follow-up questionnaires and five interviews (13-18 minutes). Data saturation was assumed when no new themes emerged from the interviews and comments. Of the interviewees, one completed the first module and the remaining four between four to nine modules.

Themes. Thematic analysis generated three key themes (presentation/format, content and helpfulness) and 10 sub-themes. Figure 7.4 presents a diagram of the themes and associated sub-themes. Table 7.2 contains quotes for each theme/sub-theme.

Overall, participants described iWaWa as generally useful and straight-forward, but not user-friendly. Participants reported feeling that it was good to know that something like iWaWa is being developed and that it should be further developed to make it accessible to more women in the same situation.

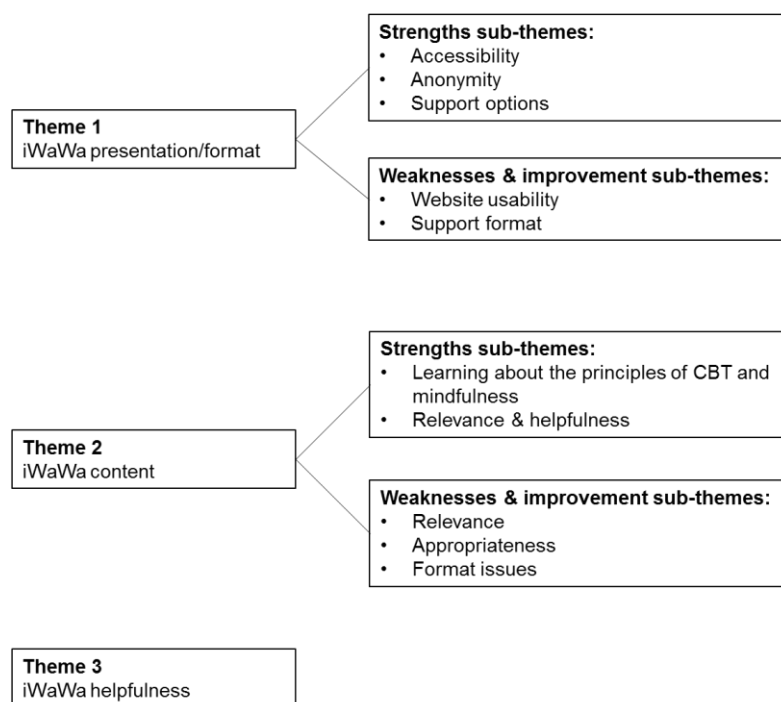


Figure 7.4. Diagram of qualitative themes and sub-themes.

Theme 1: iWaWa presentation/format

Strengths sub-themes

Accessibility. Participants enjoyed that iWaWa could be accessed from home at a time that suited them, which was reported important with a newborn baby and multiple children.

Anonymity. Women appreciated iWaWa's anonymity. One participant stated that she would have not reached out for help any other way.

Support option. The weekly email/SMS reminder option were described as a strength of iWaWa and the support phone calls as a valuable option.

Weaknesses and improvement sub-themes

Website usability. It was reported that iWaWa did not display well on their smartphones and that iWaWa was not very user-friendly and modern. Frustration was caused by having to find the iWaWa link for logging in. All stated they would prefer iWaWa as an easy to use smartphone application.

Support format. Regarding the support calls, women mentioned the importance of further highlighting the support call option and its purpose and credibility and more frequent reminders. One participant would have preferred a more anonymous option (e.g. email or text chat).

Theme 2: iWaWa content

Strengths sub-themes

Learning about the principles of CBT and mindfulness. Women stated to have especially enjoyed the first module and felt the module provided them with "tools" that some were still using, for example, by downloading mindfulness apps.

Relevance & helpfulness. Women stated that most included topics (anxieties) were generally relevant. Women described it as helpful to learn that other women experience same or similar anxieties.

Weaknesses and improvement sub-themes

Relevance. Many participants stated that not all topics were as relevant and that some were too specific, which made them skip modules. Women with multiple children

felt that iWaWa could benefit from making the content more applicable to their situation.

Appropriateness. Several women reported to have experienced the content, especially the unhelpful/helpful actions and examples, as “ridiculous” and “a bit off-putting” and promoting a certain parenting style. It was suggested that the program content should be reflecting a range of parenting styles.

Format issues. Participants felt that some of the content was repetitive and very “wordy” and could be improved by having more concise and shorter modules. It was mentioned that it was “labor-intensive” to generate their own examples for the exercises and that the exercise examples were described as “hard to relate to”. It was suggested to offer the option of using “pre-provided” statements for the exercises.

Theme 3: iWaWa helpfulness

Of the five interviewed women two felt that iWaWa helped with their anxieties, two felt that it helped a bit and one said that it probably would have helped if she had done more of the treatment. All felt that iWaWa could be more helpful with their anxieties if the presentation and content was improved.

Table 7.2

Quotes for all Themes/Sub-themes of the Thematic Analysis

Themes/subthemes	Quotes
Theme 1: Strengths sub-themes: Accessibility	Interview 1: <i>“I like the fact that I could do it in my own time at home...cause I have three children so it wasn't like I would have to try to make appointments and get childcare so I could do it when they were in bed or you know whenever it sort of seemed to fit in with my lifestyle I suppose.”</i> Interview 3: <i>“I found it quite easy especially while I was breastfeeding on my phone or my tablet, so that was good.”</i>
Theme 1: Strengths sub-themes: Anonymity	Interview 5: <i>“I generally feel pretty confident and happy and would not label myself as somebody with anxiety or any of those issues so I don't think I would have accessed help in another way because I didn't really want to be labeled as you know as an anxious or depressed or whatever.”</i>
Theme 1: Strengths sub-themes: Support options	Interview 3: <i>“The reminders were good cause I would have forgotten about it otherwise, you know to do it. It was nice to have the link on the email rather than having to find the original one.”</i> Interview 2: <i>“I suppose for some people some of the modules might sort of trigger feelings or bring up things that were a bit difficult for them so I think having that option of support [call] is definitely useful.”</i>

Table 7.2

Continued

Themes/subthemes	Quotes
Theme 1: Weaknesses & improvement sub-themes: Website usability	<p>Module 1, Comment 3: <i>“The pages weren't phone friendly- lots of scrolling left to right.”</i></p> <p>Module 1, Comment 4: <i>“Doesn't work that well on an iPhone. Few mums have time to sit at the computer.”</i></p> <p>Interview 5: <i>“I think the sort of user experience and interface and how you accessed it felt very old-fashioned compared to you know apps that feel a lot more kind of modern and easy to access on mobile and therefore fitting with your life a lot more easily.”</i></p> <p>Interview 4: <i>“You have to keep clicking next and go to the next page...because if you're Internet connection is not great and you click next then it takes a while for the next page to come up and you know it gets frustrating.”</i></p> <p>Interview 2: <i>“I don't use apps very often but yeah if that could solve the presentation issue it I might have continued a bit longer.”</i></p>
Theme 1: Weaknesses & improvement sub-themes: Support format	<p>Interview 2: <i>“I find it really hard to have any kind of phone conversation most of the time because you are always sort of having to jump up and hold the baby and deal with crying and even a 5-minute phone call could be quite challenging...I kind of just didn't have the energy and the time to engage in that.”</i></p> <p>Interview 5: <i>“I didn't feel like I needed the other support...and I suppose it wasn't clear to me who the coach was and what their qualification or skills were and if it was help you with technical issues or to help you with or offer you more support with the with your worries.”</i></p>
Theme 2: Strengths sub-themes: Learning about the principles of CBT and mindfulness	<p>Interview 5: <i>“I think that the whole of the first section explaining the principles themselves just absolutely completely changed the way I thought about certain things and helped me to go and put other things place in my life that helped me manage the anxiety so I went and signed up for a mindfulness app...and the fact that reframing unhelpful thoughts I find all of the principles really really useful and have applied it in lots of ways so that was the biggest thing for me with actually seeing ways that I could manage these sort of out of control worries without you know I don't know spending hours on the Internet.”</i></p>
Theme 2: Strengths sub-themes: Topic relevance & helpfulness	<p>Interview 2: <i>“I think cause you forget very quickly so it was pretty much just as relevant if it would have been the first time and you know each baby is different.”</i></p> <p>Interview 4: <i>“It makes you realise that there are obviously other women who are experiencing these similar things and the fact that it's being written down by a professional some of those things and anxieties that I have they haven't listened to me and they have already written that and it makes you realise that there are other people with the same worries and even that can help make you feel better.”</i></p>

Table 7.2

Continued

Themes/subthemes	Quotes
Theme 2: Weaknesses & improvement sub-themes: Relevance	<p>Interview 5 <i>"I didn't think about when your baby cries and how it makes you feel which I never had a concern or a problem with that so that just to me was too specific to make it feel like it was worth my time going through it."</i></p> <p>Module 3, Comment 2: <i>"We didn't have any problems with breastfeeding. Also my daughter is now 5 months so a bit too late for us."</i></p>
Theme 2: Weaknesses & improvement sub-themes: Appropriateness	<p>Module 2, Comment 1: <i>"The helpful actions were a bit ridiculous. Putting a baby down won't stop them crying. How can I have a cup of tea if they're still crying. The useful actions need to be rephrased about calming yourself down or give tips on how to calm a baby."</i></p> <p>Interview 1: <i>"It came across sometimes as if it was approving of a certain type of parenting if that makes sense... So like with my first I ended up with a baby that would wake up every time that I would put her down and she would only sleep if I carried her around in the sling or she was in bed with me and it felt sometimes and that gave me a lot of anxiety because everyone around me was sort of saying you're gonna make a rod for your own back and I think if I had come across this program at that point I think the way some of it was written would have given me more anxiety... I sort of felt as if that would might be pushing some mums to make a decision that didn't feel right to them because they felt like that's what they should be doing sort of thing."</i></p> <p>Module 9, Comment1: <i>"This course has been a great resource but I really feel it needs to be more inclusive of ALL parenting approaches in order not to increase the anxiety of those who have either chosen or fallen into a different path because that's what works for them. Statement such as "I can explore different settling methods to see what works best for my baby" would be far better."</i></p>
Theme 2: Weaknesses & improvement sub-themes: Format issues	<p>Interview 4: <i>"In the evening once my baby was asleep and by the time I've eaten and done chores you're really tired and I found it just sometimes quite difficult cause there were yeah so many words."</i></p> <p>Interview 2: <i>"I found it really hard to generate my own response, just when you are really tired and you haven't got much time, you got a crying baby...I suppose you could have a drop-down menu where you could choose from a list and then you could have space where could write in if they want."</i></p>
Theme 3: iWaWa helpfulness	<p>Interview 1: <i>"I still use them [mindfulness exercises] now if am feeling anxious then I try and concentrate on the moment and remember my breathing and all that so yeah I did definitely find it useful for me."</i></p> <p>Interview 2: <i>"I think maybe to a fraction...I think it's got a lot of potential if it was designed in a really user-friendly quick easy way it could be a lot more useful you know the principle of it is good just a little bit of hard work."</i></p>

Mental Health Outcomes

Table 7.3 contains the mental health outcomes for the treatment and wait-list control groups at baseline, the 8-week follow-up and 12-week follow-up. Twenty-five (28.1%) women scored in the mild anxiety range, 37 (41.6%) in the moderate anxiety range and 27 (32.6%) in the severe anxiety range on the GAD-7 at the baseline assessment. There were no significant differences between the treatment and wait-list control group on all mental health measures at baseline. At the 8-week assessment, no significant group differences were found for anxiety (GAD-7 and DASS-21 anxiety). For both groups anxiety scores significantly reduced from baseline to the 8-week follow-up. There was no significant difference between the 8-week and 12-week follow-up in anxiety scores for the treatment group. Appendix 7.4 illustrates the GAD-7 and DASS-21 anxiety scores for the three participants who started the iWaWa program and completed both follow-up assessments. There was no significant correlation between any of the anxiety scores and time since birth or number of children.

Table 7.3

Mental Health Scores at Baseline, 8-week Follow-up, and 12-week Follow-up

Measures	Baseline (<i>M, SD</i>)			8-week Follow-up (post-treatment) (<i>M, SD</i>)		12-week Follow-up (<i>M, SD</i>)	
	Total (<i>n</i> = 89)	T (<i>n</i> = 46)	WLC (<i>n</i> = 43)	Total (<i>n</i> = 29)	T (<i>n</i> = 8)	WLC (<i>n</i> = 21)	T (<i>n</i> = 4)
GAD-7	12.26 (4.21)	12.46 (3.96)	12.05 (1.98)	7.83 (4.52)	6.63 (5.29)	8.29 (4.24)	8.75 (4.03)
DASS-21							
Depression	8.16 (4.47)	8.28 (3.91)	8.02 (5.05)	4.34 (3.83)	2.75 (3.33)	4.95 (3.91)	4.75 (3.30)
Anxiety	6.52 (3.81)	6.22 (3.41)	6.84 (4.21)	3.90 (4.06)	3.38 (1.85)	4.10 (4.66)	3.00 (2.16)
Stress	11.82 (3.80)	11.63 (3.59)	12.02 (4.04)	8.38 (3.71)	7.13 (3.14)	8.86 (3.86)	10.75 (3.40)

Note. T = treatment group; WLC = waitlist-control group.

Discussion

The present study aimed to assess the trial's feasibility, iWaWa's treatment feasibility and acceptability and explore changes in postpartum anxiety in association with iWaWa. Regarding the study's feasibility, the minimum sample size required was exceeded within the relatively short recruitment period (8 weeks). Facebook proved most successful for recruitment. However, there was a high drop-out attrition from the study and also a high treatment non-usage attrition. Among women who accessed

iWaWa, the treatment was experienced as generally useful and helpful, but not user-friendly enough in terms of treatment format and content. Participants felt that iWaWa could be improved by having it as a smartphone application and by making the content more concise and inclusive of different parenting styles. Anxiety levels decreased significantly for both groups from baseline to the 8-week follow-up assessment and there were no differences between the treatment and wait-list control group. However, due to high drop-out and non-usage attrition, especially in the treatment group, the results for mental health cannot be interpreted reliably and will therefore not be further discussed. The results regarding recruitment and attrition, usability and acceptability will be discussed in more detail below including a comparison with previous literature and potential program improvements.

Recruitment and Attrition

Within a relatively short recruitment period the iWaWa trial successfully recruited more than the minimum calculated sample size through Facebook. The response rate is comparable to similar studies. A study recruiting women with postpartum anxiety for an online survey through Facebook had a similar response rate (220 respondents over 4 months) (Ashford et al., 2017 - Chapter 6). Two studies recruiting women in the UK with postpartum depression online through website advertisement banners for a web-based treatment had similar (249 respondents over 5 months; (O'Mahen et al., 2014)) and higher response rates (1403 respondents over two waves of two-week recruitment periods (O'Mahen et al., 2013)). The successful recruitment might indicate that there is an interest and potentially a need for a treatment such as iWaWa among postpartum Facebook users. However, no participants were recruited in the two clinical recruitment settings. Although using leaflets was identified by health visitors as the most feasible recruitment method in terms of workload/commitment (Ashford et al., 2017 – Chapter 5), no participants were recruited using this method. In addition, establishing relationships with clinical recruitment sites was hindered by the administrative hurdles involved in getting the study approved for the sites and frequent leadership changes. It seems therefore important to allot more time, effort and a different approach to involving healthcare professionals in the recruitment. Due to the inability to recruit participants in health care settings, it remains to be investigated whether recommendation or endorsement from health care professionals might have increased iWaWa's recruitment rates.

Drop-out attrition in the iWaWa trial was high (48.83%-91.03%). In comparison, in the open pilot study evaluating WaWa, drop-out attrition ranged from 39%-61%. However, it has been pointed out that many trials testing web-based interventions often suffer from high attrition rates (Eysenbach, 2005). Due to the lack of other trials of web-based postpartum anxiety treatments, attrition can only be compared to trials of postpartum depression. Regarding postpartum web-based treatments, one study evaluating the feasibility for depression with minimal support (Netmums program) reported a high attrition rate (76%) (O'Mahen et al., 2013). The study found that like the current trial, there was an initial high access with a small user sub-group continuing to access and use the program. The authors discussed the role of curiosity and it has been suggested that one session may satisfy the user's need (Milgrom et al., 2016). The Netmums program's attrition reduced to approximately 20% at the post-treatment assessment when telephone support was added (O'Mahen et al., 2014). Similarly, the web-based MomMoodBooster program for postpartum depression with telephone guidance also reported comparably very low attrition rates (Danaher et al., 2013; Milgrom et al., 2016). When comparing iWaWa's attrition to postpartum depression trials, it has been noted that a systematic review found higher Internet intervention adherence rates for depression than anxiety (Christensen et al., 2009).

There are a variety of factors that could have caused iWaWa's high attrition. Commonly identified reasons for drop-out include the burden of the program, program information structure, content relevance, level of support, technical access issues, time constraints, lack of motivation, and improvement of the condition (Christensen et al. 2009; Donkin & Glozier, 2012; O'Mahen et al., 2013). The potential role of these factors regarding iWaWa's high attrition will be briefly discussed.

The current study suggests that some women indeed experienced the access, length and exercises of iWaWa as a burden. For example, one lesson learned from this study concerned the use of personal identifiers. The baseline assessment required participants to create an eight-digit personal identifier (last two letters of their forename, last two letters of their surname, last two letters of their road/street name, two digits referring to the month you their born). The code was needed for all iWaWa chapters and follow-up assessments. Nineteen respondents stopped the baseline assessment when asked to create the identifier and several participants entered a different identifier for the chapters (two were unidentifiable) or assessments. One

interviewee described entering the identifier as “cumbersome”, so the identifier could have affected both study and treatment adherence.

With the infant’s demanding schedule it is possible that iWaWa participants felt a lack of motivation or experienced time constraints. For web-based postpartum depression treatments adherence was high when scheduled support was offered (Danaher et al., 2013; Milgrom et al., 2016; O’Mahen et al., 2014). Scheduled support was part of the original WaWa treatment and valued as a strength of the treatment (Rowe et al., 2014). Based on a survey which found that telephone support was not the preferred mean of support among women with postpartum anxiety (Ashford et al., 2017 - Chapter 6), it was decided for iWaWa’s telephone support to be optional. Scheduled support might improve adherence of women wanting this type of support, but it might also put off women who do not feel the need or find it unsuitable. Offering to opt in for scheduled support at the treatment start might be an alternative for future iWaWa versions.

Regarding content relevance, a qualitative study suggested that being able to identify with a program helps with adherence in online psychological interventions (Donkin & Glozier, 2012). Since some of iWaWa’s topics were not experienced as relevant, it could be perhaps that some participants logged into iWaWa, but dropped-out because they experienced the topics as irrelevant.

Concerning symptom improvement, a recent systematic review and meta-analysis found that the prevalence of postpartum anxiety decreases from 1–4 weeks to 5–12 weeks (Dennis et al., 2017) and it could therefore be that the participant’s symptoms improved and they no longer felt the need for iWaWa. In addition, almost half of the participants scored in the severe to extremely severe range of stress. It might be that participants were in need of stress management techniques, which could be incorporated in future iWaWa versions. The iWaWa program used an organic information structure design which allowed users to freely explore the modules. Using a tunnel design in which users navigate through content in a sequential order has been identified as less likely to overwhelm users with options (Danaher, McKay, & Seeley, 2005) and may increase use (Crutzen, Cyr, & de Vries, 2012).

In addition, in a viewpoint paper regarding the law of attrition 14 factors which could influence both non-usage and drop-out attrition of e-health trials have been proposed (Eysenbach, 2005). Appendix 7.5 presents those factors with a description of

their relevance to the present study and a rating of the potential impact of each factor on attrition. Based on the rating, eight out of 14 factors were rated as having a high risk, three as having a moderate to high risk and three as having a low-risk of having influenced this study's attrition. The factors rated as having a high risk included: (1) Ease of drop out / stop using it; (2) usability and interface issues; (3) lack of personal contact via face-to-face or phone; (4) lack of positive feedback, buy-in and encouragement from change agents/health professionals/care providers; (5) lack of tangible and intangible observable advantages in completing the trial or continuing to use it; (6) lack of networking effects/peer pressure, peer-to-peer communication, and community building; (7) experience of the user (accessibility issues); (8) intervention free-of-charge. This highlights that there are a multitude of areas that could have resulted in the high attrition of this study and which could be improved for future iWaWa studies.

iWaWa's Usability and Acceptability

Participants enjoyed iWaWa's accessibility, anonymity and weekly reminders, as well as the introduction to the principles of CBT and mindfulness. This is in line with previous qualitative research regarding web-based treatments for postpartum depression (Haga et al., 2013; O'Mahen et al., 2015; Pugh et al., 2015), as well as postpartum UK healthcare professionals (health visitors) (Ashford et al., 2017 - Chapter 5).

iWaWa was rated and experienced as generally useful and helpful, but not user-friendly enough. The iWaWa content was experienced as too long. A preference for brief modules was also identified by online surveys among a sample of adults (Batterham & Calear, 2017) and among women with postpartum anxiety (Ashford et al., 2017 - Chapter 6). Participants also felt that iWaWa's content was not inclusive of different parenting styles. WaWa's content was found to be acceptable in a small sample ($n = 7$ in the post-treatment evaluation interview) pilot study in Australia (Rowe et al., 2014). It might therefore be important to investigate in more depth the needs of a larger and more diverse sample women with postpartum anxiety so iWaWa's content and format can be adapted to better meet their needs.

Women in this study also felt that not all topics were relevant. The need for web-based treatments to be relevant to their own needs and circumstances was also discovered among women with postpartum depression (Haga et al., 2013; O'Mahen et

al., 2015). Future iWaWa versions might benefit from presenting users with content most relevant to them (e.g. anxiety topic needs/relevance assessment prior to the treatment start).

Interactive components with space for responses were previously found to be valued among women with postpartum depression (O'Mahen et al., 2015). Even though most iWaWa users engaged with the exercises many experienced them as difficult. The ease of usage of the interactive components seems important among iWaWa users and therefore exercises of future iWaWa versions should be tested by potential users prior to implementation (e.g. think-out aloud technique).

Regarding the format, iWaWa participants experienced the log-in process as difficult. The log-in process was also identified as difficult by women testing a web-based postpartum depression treatment (Haga et al., 2013). Participants also expressed that iWaWa was not smartphone-friendly, which was also reported by women testing a web-based treatment for postpartum depression (Haga et al., 2013). The preference for a smartphone-compatible treatment was also found in a survey among women with postpartum anxiety (Ashford et al., 2017 - Chapter 6). iWaWa was smartphone compatible, but iWaWa as a smartphone application might improve the ease of access and presentation on smartphones.

Limitations

The generalisability of the current results is compromised due the use of convenience sampling and a homogenous sample. Findings may therefore not be representative of women from different cultural or ethnic backgrounds, lower socio-economic status and more severe anxiety. In addition, most women were recruited through Facebook, so findings are limited to this self-selected pool of women. However, the homogeneous nature of this sample can also be a strength, as results can be generalised for this specific group. Further, no incentives were offered during the enrolment, allowing for a sample with a genuine and intrinsic interest. The generalisability may also be affected by the fact that the anxiety status was established by a screening instrument and not by a diagnostic tool. However, the GAD-7 is a frequently used anxiety screening tool and been suggested as suitable for postpartum anxiety (Pierson et al., 2017). In addition, diagnostic interviews are less anonymous and iWaWa's anonymity was highlighted as an important strength by the participants.

High drop-out and non-usage attrition may have also biased the results. Therefore, findings regarding iWaWa's usability, acceptability and mental health changes are limited to the experiences and views of a small sample. None of the women who did not start iWaWa took part in the follow-up interviews, so no knowledge could be gained regarding what caused the early drop-out.

The interviewer of this study was M.A., who is a PhD student investigating web-based treatments for postpartum anxiety with personal experience related to this subject. These experiences may have affected the data collection, analysis and interpretation. Therefore, several actions were taken to minimise the likelihood of this risk. Participants were aware that the interviewer was the main study lead, but were reassured of the importance of any feedback (positive and negative) for improving iWaWa. The qualitative analysis also included comments from the iWaWa modules and the follow-up assessment in which women might have felt more comfortable providing negative feedback. M.A. kept a reflective journal to consider how the treatment and interviewee responses affected her own views on iWaWa throughout data collection, analysis and reporting. An effort was made to consider this when analysing the data. Interviewees were offered monetary compensation for their time, which might have confounded their responses.

Conclusion

This study demonstrated that there is an interest in a postpartum anxiety web-based treatment like iWaWa. However, the iWaWa study and program in the current format is not yet feasible and acceptable and due to high dropout rates the results on the impact of iWaWa on anxiety cannot be interpreted reliably. Nonetheless, the study revealed strengths and weaknesses of the iWaWa content and format, as well as highlighted potential areas of improvements. As a first study investigating the feasibility and acceptability of a web-based treatment specifically targeted at postpartum anxiety, these results provide useful information about web-based treatment preferences in this population. These findings can not only help improve iWaWa, but also inform other research and development to optimise feasibility, acceptability and web-based treatment adherence in this population. This study also contributes to filling the gap in evidence-based self-help for mild to moderate postpartum anxiety symptoms.

CHAPTER 8 – OVERALL DISCUSSION

The presented thesis consists of two reviews (Chapter 2 & 3) and three studies (Chapters 4-7) that addressed the overall research aims which include (i) an examination of the need for and interest in web-based postpartum anxiety interventions and (ii) the development and evaluation of a web-based version of the existing What Am I Worried About (WaWa) program for postpartum generalised anxiety disorder.

Chapters 2 to 7 presented the work which addressed these aims and contain a discussion of the findings and implications in relation to each specific aim of the study. The aim of this chapter is to provide an overall discussion of the findings and implications across the following three sections. The first section is a summary and synthesis of the findings of each article, explaining how they link together and address the overall thesis aims. Main themes emerging from the results and their relation to previous literature are also discussed. The second section outlines and discusses methodological strengths and limitations. The third section considers clinical and research implications. The chapter concludes with an overall conclusion.

Summary and Synthesis of Findings

This section includes a (i) summary of the combined findings from this PhD thesis and outlines how they link together and (ii) a summary and discussion of the main findings.

Summary of Combined Findings

Table 8.1 presents the key findings from each chapter of this thesis's investigations. Results from earlier chapters informed subsequent studies including the development and evaluation of the iWaWa treatment.

Table 8.1

Summary of Key Findings from all Articles in this Thesis

Chapter	Key Findings
2	<ul style="list-style-type: none"> - Computer- or web-based interventions for perinatal depression and complicated grief may be effective. - No web-based intervention targeted specifically at postpartum anxiety was found.
3	<p>Web-based interventions for anxiety available on the world wide web:</p> <ul style="list-style-type: none"> - were designed for a variety of anxiety issues. - were predominately cognitive behaviour therapy-based. - employed a variety of treatment formats. - in many cases lacked the report of empirical evidence of efficacy.
4	<p>Interviews with health visitors found:</p> <ul style="list-style-type: none"> - the need for perinatal mental health training in general and postpartum anxiety specifically. - the need for better coverage of specialist mental health services. - the need for development of interventions targeted at postpartum anxiety.
5	<p>Interviews with health visitors further found:</p> <ul style="list-style-type: none"> - that web-based interventions were regarded as suitable as an additional option for a subgroup of postpartum women. - benefits which included increased availability of a treatment tool for postpartum anxiety and treatment anonymity and flexibility. - concerns such as women's state of mind, decreased human and professional contact, as well as IT access and literacy, and language skills. - the importance of one-to-one support offered with web-based interventions. - that a feasible way of implementation would be flyers for HVs to include with other information provided after birth or to hand out and discuss during their visits. - the need for sufficient evidence of treatment efficacy and appropriate training.
6	<p>A survey of postpartum women showed:</p> <ul style="list-style-type: none"> - Unpaid social media can be feasible in reaching postpartum women with anxiety. - Most postpartum women in this sample expressed interest in web-based postpartum anxiety treatments. <p>Postpartum women preferred:</p> <ul style="list-style-type: none"> - the treatment content to be split into short sections. - the availability of different forms of therapist support. - a flexibly accessible smartphone/tablet application format.
7	<p>Regarding the iWaWa trial feasibility:</p> <ul style="list-style-type: none"> - Facebook was most successful in recruiting postpartum women with anxiety. - There was a high drop-out from the study, especially within the treatment group. <p>Regarding the iWaWa treatment:</p> <ul style="list-style-type: none"> - There is an interest in a web-based treatment such as iWaWa among women with postpartum anxiety. - There was a high non-usage attrition. - iWaWa was rated and experienced as generally useful and helpful. - iWaWa's format and content were rated and experienced as not user-friendly enough. - iWaWa could be improved by having it as a smartphone application and by making the content more concise and inclusive of different parenting styles.

In Chapter 2, a systematic literature review of computer- or web-based interventions targeted at improving perinatal mental health found that there were few studies published. Preliminary evidence suggests that these interventions may be

effective, especially for depression and complicated grief. The review highlights that no such intervention was targeted at postpartum anxiety specifically. Furthermore, the findings established that web-based intervention for mental health issues can be effective in postpartum women and that there is a need for such interventions to be developed for postpartum anxiety specifically.

Chapter 3 synthesised and reviewed publically available web-based intervention programs for anxiety on the world wide web in terms of website and intervention program characteristics, therapeutic elements and published evidence of efficacy. The systematic search found a diversity of predominately cognitive behaviour therapy-based programs, which were designed for a variety of anxiety issues and employed a variety of treatment formats. Results from the study were used to guide the development of iWaWa, for example, in terms of identifying treatment approaches which are commonly used on the web and are easily translatable into a web-based format (CBT and mindfulness). As WaWa is a CBT and mindfulness-based self-help booklet, it was considered suitable for translating into a web-based format. The findings further informed the translation of WaWa's written booklet content into a web-based version through identified multimedia and interactive options in the review. In addition, the review highlights the importance of empirically evaluating new web-based interventions before making them publically available on the web. Furthermore, none of the identified programs were for postpartum anxiety specifically, further highlighting the need for such an intervention.

The first two chapters of this thesis revealed that there was no web-based intervention for postpartum anxiety specifically and thereby a need for the development of such a treatment was established. It was further important to establish if this need is also perceived among postpartum health care professionals and postpartum women in England. Chapter 4 and 5 qualitatively explored health visitors' experiences of supporting women with postpartum anxiety and their views on the acceptability and potential implementation of internet-based postpartum anxiety interventions in their practice. Findings highlighted a lack of specialist mental health services coverage and interventions targeted at postpartum anxiety, confirming that English postpartum health care professionals (HVs) perceived a need for the development of easily accessible interventions targeted at postpartum anxiety. Web-based interventions for postpartum anxiety specifically were regarded as suitable as an additional option for a subgroup of postpartum women, and the anonymous and flexible format of such an intervention

might be especially suitable for postpartum women. Hence, web-based interventions were regarded as acceptable among HVs and seen as suitable by them for sub-group postpartum women. HVs concerns about decreased human and professional contact also informed the iWaWa development by offering support calls as part of the treatment. HVs stated that handing out flyers about a web-based postpartum anxiety intervention would be the most feasible way of recruitment. This information informed the recruitment strategy of the iWaWa feasibility study. Therefore, HVs or other health care professionals participating in the iWaWa study recruitment were provided with study flyers.

Using an online survey, Chapter 6 explored the interest of postpartum women with anxiety issues in web-based treatments and the feasibility of reaching women with postpartum anxiety online in England. The findings suggested that unpaid social media can be feasible in reaching women with postpartum anxiety. Therefore, this recruitment approach was used for the iWaWa feasibility study. The considerable number of respondents ($n = 114$) and the fact that most of the respondents (61%) expressed interest in web-based postpartum anxiety treatments highlighted that there is interest and a potential need for web-based treatments among postpartum women in England. The study further revealed preferences of respondents in web-based treatments. For example, the content should be split into short sections and a flexibly accessible smartphone/tablet application format should be employed. This informed the web design of the iWaWa intervention. For example, chapters were kept short and the website was designed to render to a smartphone/tablet format.

Chapter 7 evaluated the feasibility and acceptability of iWaWa for women with postpartum anxiety problems in the England using a randomised controlled feasibility trial and semi-structured interviews. The study revealed that Facebook was most successful in recruiting postpartum women with anxiety for this trial and there was a high participant drop-out, especially within the treatment group. Regarding the iWaWa treatment the considerable recruitment response indicated interest in a web-based treatment such as iWaWa among women with postpartum anxiety. However, there was also a high non-usage attrition. Overall, iWaWa was rated and experienced as generally useful and helpful, but its format and content were rated and experienced as not user-friendly enough. The findings suggest that iWaWa could be improved by developing it as a smartphone application and by making the content more concise, relevant and inclusive of different parenting styles.

Main Themes

Taken together the results from all chapters, the following three main themes emerged regarding web-based postpartum anxiety treatments: (i) Need for and interest in web-based postpartum anxiety treatments; (ii) iWaWa uptake, engagement and adherence issues; (iii) iWaWa intervention issues.

Need for and interest in web-based postpartum anxiety treatments. The results from this investigation show that there is an interest in and need for web-based treatments for postpartum anxiety. This was demonstrated on a variety of levels, including a literature review (Chapter 2), a web search (Chapter 3), interviews with HVs (Chapter 4 & 5), an online survey of women with postpartum anxiety (Chapter 6), as well as a feasibility study of a postpartum anxiety web-based treatment (Chapter 7).

The systematic review (Chapter 2) highlighted that despite developed web-based treatments for postpartum depression, stress and complicated grief, at the time of the review no web-based treatment had been developed for postpartum anxiety specifically. A similar systematic review was published around the same time focussing on web-based interventions for mood disorders in the perinatal period (Lee et al., 2016) and a meta-analysis of therapist-supported internet-based cognitive behaviour therapy for postpartum stress, anxiety, and depressive symptoms was published a year later (Lau et al., 2017). Both reviews did not find any web-based interventions targeted at postpartum anxiety specifically. The search terms used for the systematic review (Chapter 2) were adapted (limited to the postpartum period, anxiety and publication date from December 2014) and an updated search was carried out in November 2017 to see if any relevant articles had been published since the published systematic review (2016). The search found a study reporting usability testing of an online intervention for enhancing partner support and preventing perinatal depression and anxiety (Pilkington, Rominov, Milne, Giallo, & Whelan, 2017) and a RCT of an internet-provided cognitive behaviour therapy for posttraumatic stress symptoms following childbirth (Nieminen et al., 2016). No web-based treatments targeted specifically at postpartum anxiety were found. This demonstrates that there is still a need for such a treatment and that iWaWa is at the moment the only web-based treatment specifically targeted at postpartum anxiety.

The web search and review of web-based anxiety interventions (Chapter 3) found that there was a variety of web-based programs for different anxiety issues and

populations, but no program was targeted at the postpartum period. The interview study (Chapter 4 & 5) revealed that HVs perceived a need for the development of interventions targeted at postpartum anxiety in general and a web-based format. The online survey (Chapter 6) found that the majority of postpartum women from this sample expressed interest in web-based postpartum anxiety treatments. Considerable response rates to the online survey (Chapter 6) and the feasibility trial (Chapter 7) further suggest that postpartum women are interested in web-based interventions for postpartum anxiety. Despite the highlighted interest, a main finding of the iWaWa feasibility trial was high drop-out rates and non-usage attrition. Therefore, attention must be drawn to the fact that there is a discrepancy between interest of women in a web-based postpartum treatment (Chapter 6) and the actual usage of such a treatment (iWaWa) Chapter 7).

Regarding interest in web-based treatments, the findings from this investigation also show that not all women with postpartum anxiety were interested in this type of treatment. In both the online survey (Chapter 6) and the feasibility study (Chapter 7) the participants were mainly white and well-educated postpartum women in their early thirties. This might indicate that postpartum women with these characteristics are more interested in this type of treatment. The high dropout rates from the feasibility study (Chapter 7) could also be an indicator that iWaWa was not of interest or suitable to everyone. Further, the interviewed health visitors (Chapter 5) also reported that this type of treatment might not be suitable for all postpartum women. Studies evaluating web-based treatments for postpartum depression recruited samples with similar demographic characteristics (Danaher et al., 2013; Milgrom et al., 2016; O'Mahen et al., 2013, 2014). Taken together, there seems to be a need and interest in web-based postpartum anxiety treatments like iWaWa, but this specific treatment type might only be of interest or suitable for a subgroup of postpartum women. This might also suggest that iWaWa and web-based postpartum anxiety treatments in general may best be offered as an alternative or supplement to other forms of treatment.

iWaWa uptake, engagement and adherence. As reported in Chapter 7, the iWaWa intervention in the feasibility trial had low uptake, engagement and adherence rates. Chapter 7 also contains a discussion of several factors that could have caused iWaWa's high attrition, including burden of the program, program information structure, content relevance, level of support, technical access issues, time constraints, lack of motivation, and improvement of the condition. In Eysenbach's (2005)

influential paper "Law of Attrition" he outlined a variety of concrete factors that can influence attrition, including appropriateness of information, ease of enrolment, usability issues, "push" factors (e.g., reminders), positive feedback, paid intervention and other incentives, observable advantages, time commitment, external events competing for the participants' attention, competing interventions, peer communications/peer pressure, human contact, experience of use, and ease of drop out. The relevance of these suggested factors to iWaWa's attrition rate has been discussed in Chapter 7.

Other potentially relevant factors not discussed in Chapter 7 are stigma, level and type of treatment support/guidance, as well as individual characteristics, such as level of anxiety, comorbidity and minority status. The relevance of stigma regarding treatment uptake among postpartum women has been discussed in Chapter 1 (p. 34) in more detail. Regarding support, a systematic review found that the frequency of interaction with a therapist or counsellor was a significant predictor of adherence (Kelders, Kok, Ossebaard, & Van Gemert-Pijnen, 2012). Another systematic review highlighted that guidance is a beneficial feature of internet-based interventions, but that the effect between guided and unguided is not as pronounced as previously reported (Baumeister et al., 2014). This review also found that the evidence regarding the dose and communication mode of guidance is still scarce. A recent randomised controlled trial of an Internet-based self-help treatment for panic disorder found that scheduled support resulted in lower drop out and better adherence compared to optional support (Oromendia, Orrego, Bonillo, & Molinuevo, 2016). This suggests that adherence of iWaWa might be improved by scheduling the support rather than making it optional. It would be interesting for future research to review the impact of mode and dose of guidance on uptake and adherence of Internet interventions specifically.

A systematic review on adherence in Internet interventions for anxiety and depression found that lower symptom levels of GAD predicted better adherence (Christensen et al., 2009). Considering that 74% of the iWaWa study participants had moderate to high anxiety scores on the GAD-7, symptom severity could have been a relevant factor, especially since WaWa was initially developed for mild to moderate anxiety levels. Regarding ethnic minorities and treatment uptake it has been reported that people from minorities tend to seek help at a later and more advanced stage of their mental health condition and they tend to have a higher chance of dropping out prematurely from treatment (Leong & Kalibatseva, 2011). Considering these individual

factors, it has been proposed that adherence and efficacy of Internet interventions could be improved by making the interventions more personally relevant. Personal relevance could be achieved by making Internet interventions tailored, transdiagnostic (relevant to comorbidity) (Păsărelu et al., 2017), and culturally sensitive (Choi et al., 2012), as well as offer choice of intervention (Gerhard Andersson, Estling, Jakobsson, Cuijpers, & Carlbring, 2011).

In addition to the discussed factors and empirical findings it is important to identify the relationship between those factors and findings and existing theories to facilitate the development of more comprehensive theories and models to inform the development of attractive and 'sticky' Internet-based interventions which maximise adherence (Chiu & Eysenbach, 2010). When considering factors of uptake, engagement and adherence in Internet-based treatments, behaviour change and health care utilisation theories and models are of value. Relevant behaviour change models are for example, the Transtheoretical Model (TTM; also called the Stages of Change Model) (Prochaska & Velicer, 1997) and the Health Belief Model (HBM) (Rosenstock, 1990). The TTM postulates that people move through six stages of change: precontemplation, contemplation, preparation, action, maintenance, and termination. Regarding iWaWa's uptake and adherence, some women with postpartum anxiety might be, for example, in the precontemplation stage, hence not motivated to take part in self-help interventions such as iWaWa. Others might be in contemplation, hence recognise that their anxiety is problematic, but may still feel ambivalent about taking action. The HBM suggests that perceived severity of the illness, perceived benefits and barrier of taking health action, internal or external cues to action and self-efficacy influence whether people change behaviour. As discussed in Chapter 1, for postpartum women especially perceived barriers, such as practical and structural challenges, health care provider issues and stigma are prominent. In addition, iWaWa's therapist support option could have been an external cue to action. However, none of the iWaWa participants used the support which might have reduced exposure to this potential external cue to action.

Based on Andersen's Behavioural Model of Health Service Utilization (Andersen, 1995; Andersen & Newman, 1973) and Venkatesh's Unified Theory of Acceptance and Use of Technology (Venkatesh, Viswanath Morris, Davis, & Davis, 2003) Chiu and Eysenbach (2010) propose four stages of use for Internet-mediated interventions: consideration, initiation, utilisation, and outcomes. The authors highlight the importance of conceptualising Internet-mediated intervention 'use' and 'adoption'

as a dynamic, continuous, longitudinal processes which occurs in various stages and the advancement to the next stages is influenced by different factors. In a study testing the theory, the first stage was mainly influenced by technological factors and clinical and technological factors played an equally important role in the later stages. Considering that iWaWa had several technological issues could explain why initiation and utilisation were so low. Taken together, a variety of technological features of the intervention, features of the study design, mode of support, as well as personal characteristics play a key role in the adherence to Internet-based interventions. The next section will discuss intervention issues (technological and content) and potential ways of improving these issues in more detail.

iWaWa intervention issues. The development and design of iWaWa was based on recommendations by Ritterband et al. (2003), findings from the systematic literature review (Chapter 2) and the web review (Chapter 3). In addition, special consideration was given to the preferences stated by postpartum women with anxiety in the online survey (Chapter 6) and the views of health visitors (Chapter 5). This was done considering the given resources and time constraints of this investigation. For example, it was possible to integrate audio relaxation exercises, online homework and treatment email reminders as an element of iWaWa. Except for two women, all women who accessed the first chapter signed up for email or phone reminders, validating the finding from the survey that reminders are in fact welcomed by postpartum women for this type of treatment. Literature also suggests that using reminders can improve treatment adherence (Donkin & Glozier, 2012). As all participants starting the iWaWa treatment in the trial (Chapter 7) signed up for reminders it cannot be determined with the study design whether reminders improved adherence.

Rather than developing new treatment content and material, it was regarded as most appropriate to translate an already existing treatment. WaWa was deemed appropriate as it was designed for women with postpartum anxiety and the self-help booklet format made it suitable for translating the content into a web-based format. However, as the format and treatment content already existed, this meant that some of the preferences stated by women in the online survey could not be incorporated. For example, women stated to be interested in experience stories from other women (83.6%) and treatment videos (53.4%), but WaWa did not include those features. Other preferences stated in the online survey could not be incorporated due to technical limitations. Due to limited resources and time it was decided to use a City, University

of London blog website in combination with Qualtrics. This design did not allow us to incorporate, for example, an online forum, regular mood checks and live-chat rooms with other women, all components of high value from the online survey (Chapter 6). In terms of iWaWa's content and conceptual model, no changes were made during the adaptation process. WaWa was based on CBT and mindfulness and used life-stage specific examples. As the iWaWa feasibility trial did not specifically aim to evaluate the efficacy of the content and conceptual components, it is difficult to draw conclusions regarding what changes should be made. The limited qualitative data revealed that participants especially enjoyed the psychoeducational component of iWaWa (e.g. reframing and identifying unhelpful thoughts), but that not all of iWaWa life-stage specific topics were as relevant and that some may have been too specific. In addition, some of the content was experienced as "off-putting", anxiety-provoking and promoting a certain parenting approach.

Regarding the relevance of content, an open pilot trial with 27 patients with mixed anxiety disorders tested the effectiveness of letting users themselves decide what modules to do during an Internet-delivered cognitive behaviour therapy (Andersson et al., 2011). The results showed significant symptom improvement for most participants with only one drop-out. To increase content and treatment relevance, a similar patient choice approach could be incorporated in future iWaWa versions. Furthermore, promoting a certain parenting style in a postpartum anxiety treatment such as iWaWa might cause women who do not practice this style to feel incompetent. Closely related to competence is the construct of parenting self-efficacy, which has been defined as "the expectation caregivers hold about their ability to parent successfully" (T. L. Jones & Prinz, 2005; p. 342). It has been shown that low self-efficacy is associated with heightened reported fear arousal and more physiological reactivity in dealing with stressors (Bandura, Reese, & Adams, 1982), hence, might even cause more anxiety. It would therefore be important to create an iWaWa version which does not promote a certain parenting style.

The research in this thesis revealed the interest in and importance of offering a web-based treatment as an app for postpartum women. Most postpartum women from the online survey (Chapter 6) preferred to access web-based treatments as a smartphone/tablet application (52.2%) or as both a website and smartphone/tablet application (37.4%). Due to financial limitations, it was not possible to develop iWaWa as a smartphone application for this study. However, to accommodate the women's

wishes, iWaWa was designed to render to both a regular desktop/laptop screen, as well as to tablet and smartphone screens. Even with this feature, the qualitative analysis of the comments and interviews from the iWaWa feasibility trial (Chapter 7) attested that women would have preferred the intervention to be a smartphone app, especially as the content did not present as well on the phone as it did on the computer, for example, women reported that it involved a lot scrolling left and right. This result is consistent with a feasibility study which found that a common treatment barrier of web-based interventions among postpartum women with depression is the inaccessibility of the treatment as tablet/smartphone applications (Haga et al., 2013). Similarly, a survey found that perinatal women are likely to download health-related apps and concluded that there may be a need for designing, developing, and testing apps for perinatal depression prevention programs (Osma, Barrera, & Ramphos, 2016). The overall findings highlight the importance of offering postpartum anxiety treatment in a smartphone application format or in a web-based format which renders appropriately to a smartphone screen.

Another main format issue that emerged from the findings of this thesis concerned the support offered within the web-based treatment. Based on previous literature, web-based interventions with support (e.g. a therapist or other health care professional) usually have better outcomes (Palmqvist et al., 2007). Women with postpartum mental health problems reported enjoying and valuing support (Pugh et al., 2015), wanting the opportunity to Skype or chat with a mental health expert (Maloni et al., 2013), feeling unable to complete the treatment course without support (O'Mahen et al., 2015) and that adding a support option improved the treatment (Haga et al., 2013). Consistent with these findings, more than half of the surveyed postpartum women (Chapter 6) stated they were more interested and likely to use web-based treatment when it had therapist support than without. This was further confirmed in the interviews with HVs (Chapter 5) who also highlighted the importance of a support function within a web-treatment. However, of the women with postpartum anxiety surveyed online (Chapter 6), most reported more interest in less personal and more anonymous support options (e.g. email and instant messaging/chat) compared to telephone or Skype support.

These findings contradict the finding from a previous study that postpartum women expressed interest in telephone support (O'Mahen et al., 2015). As discussed in Chapter 6, O'Mahen's (2015) study focussed on views of women with postpartum

depression and women with postpartum anxiety may prefer less personal support. However, a considerable amount of women did nonetheless express interest in support in general, as well as telephone support (41.6%). It was therefore decided to keep the telephone support option for iWaWa, especially as it was part of the original WaWa booklet. Interestingly, of the women who accessed the iWaWa exercise chapters in the trial, only one women in the trial expressed interest in a support call, but did not schedule a call (Chapter 7). This supports the finding from the online survey (Chapter 6) that postpartum women with anxiety might be less interested in telephone support.

Strengths and Limitations

Strengths and limitations specific to the five studies of this investigation have been addressed in each corresponding chapter (2-7). This section provides an overview of overall important methodological issues. The first sub-section provides a summary of the methodological strengths of the studies, which is followed by a discussion of the most important limitations.

Strengths

The research presented in this thesis has a number of strengths. The first noteworthy strength of the work in this thesis is that the development and evaluation of the iWaWa treatment was based and guided by two models, namely the steps to developing internet interventions outlined by Ritterband et al. (2003) and the stage model of behavioural therapy research (Onken et al., 1997; Rounsaville et al., 2006). Using models provided a structure for the iWaWa treatment development and evaluation endeavours.

Further, both models informed the design of the mixed methods approach employed in this thesis. The use of a mixed methods design can also be regarded as a strength of this thesis. A mixed methods research design “mixes” both quantitative and qualitative research and methods to understand a research problem. Combining methods can provide a better understanding of research problems than a single approach and provides strengths to offset the weaknesses of a single approach (Cresswell & Plano Clark, 2011). Qualitative methods employed were semi-structured interviews (Chapter 4, 5, & 7), as well as written survey comments (Chapter 7). Quantitative methods were a systematic review (Chapter 2), a web search and website review (Chapter 3), a self-reported online survey (Chapter 6) and a feasibility RCT (Chapter 7). This mixed methods approach was adopted based on the two previously

outlined models. In addition, transforming an existing treatment into a web-based format is complex and therefore mixed methods were thought to be most appropriate. For the development and evaluation of new treatments qualitative data play a key role (Ritterband et al., 2003). It allows the developer/researcher to get more in-depth insight into the needs and issues related to the treatment. In regard to this thesis, the analysis of comments and interview data regarding the participants experience with iWaWa (Chapter 7) highlighted iWaWa's weaknesses and provided insight into why a considerable number of participants might have dropped-out or discontinued iWaWa.

A further advantage of this investigation was the focus on feasibility research. Both models used for the development and evaluation of iWaWa highlighted the importance of feasibility work before conducting a full-scale efficacy study. Focussing on feasibility allows to identify challenges in terms of interest, study and treatment feasibility and acceptability which might influence the ability to deliver the treatment or implement the study as planned (Feeley et al., 2009; Tickle-Degnen, 2013). This was addressed with postpartum health care professionals (HVs) interviews (Chapter 4 & 5), an interest and preference online survey of potential iWaWa users (Chapter 6), and a randomised controlled trial which investigated study and treatment feasibility and acceptability (Chapter 7). Using this approach, it was revealed that only a subgroup of postpartum women might be interested in a treatment like iWaWa and that the iWaWa study and program in the current format was not yet feasible or acceptable. These findings provide important insight regarding modifications to the current iWaWa study and treatment format to make both more feasible and acceptable.

Another strength is that different perspectives were used to inform the development of iWaWa. Both, postpartum women and postpartum health care professionals (HVs) were asked for their views on web-based postpartum anxiety treatments (Chapter 4, 5, & 6). Often intervention development focusses exclusively on the view of the end user but neglects health care professionals, who play an important part in the implementation and promotion of new treatments (Glasgow et al., 2001). A new treatment should meet the needs of future users and fit into the health care system and meet the needs of health care professionals in terms of logistics, workload and training. For example, health visitors in the interview study (Chapter 5) mentioned the need for sufficient evidence of web-based treatment efficacy and appropriate postpartum mental health training.

Limitations

The work in this thesis needs to be examined with a few limitations in mind. These have been divided into study sampling and feasibility methodology.

Study sampling. When evaluating and interpreting the findings from this investigation issues regarding sampling need to be considered. Issues concern website sampling from the web review study and participant sampling from the HV interview study, the online survey study, as well as the iWaWa feasibility study.

The web search and review of web-based interventions for anxiety was conducted in March 2015 (Chapter 3). The web develops and changes at a rapid pace and, as acknowledged in the article, programs existing at the time may have changed (including content, therapeutic technique or progressiveness of interactivity and multimedia presentation) or been discontinued and new programs may have been released. Hence, there is a chance that a web-based treatment for postpartum anxiety may now be available. A recent search was carried out using the search terms from the study on the most popular search engine (Google). This search found no new web-based programs for postpartum anxiety publicly available on the web (November 2017), which suggests that there may still be the need for such. It also suggests the results from Chapter 3 are still applicable, two and a half years later.

Convenience sampling was used for the interview study with health visitors, the online survey of postpartum women and the iWaWa feasibility study. The generalisability of the results may therefore be impacted by the studies' samples which are not representative due to their self-selected nature, small sample sizes and focus on the UK context. The interview study (Chapter 4 & 5) consisted of a small sample of self-selected HVs specific to the UK context. The sample may therefore not be representative and results might not be generalisable. The vast majority of interviewees were white, although the sample was diverse in terms of geographical spread across the different areas in the UK, as well as different levels of working experience and perinatal mental health training. The UK focus may limit the generalisability of the results, but makes them highly applicable in the UK context. Future research needs to explore other related health care professionals' views on web-based postpartum anxiety treatments, for example, midwives, general practitioners or providers of specialist perinatal mental health services.

Convenience sampling in both the online survey (Chapter 6) and the feasibility study (Chapter 7) resulted in a sample of mainly white and well-educated women in their early thirties. In addition, the majority of women was recruited from social media, primarily Facebook. Due to nature of the samples it remains unclear how women from different age groups, different cultural or ethnic groups, as well as socioeconomic backgrounds would differ in terms of their interest in, and preferences for postpartum anxiety web-based treatments. The feasibility and acceptability of iWaWa might be different in other demographic groups. However, the homogeneous samples from both studies can also be a strength (Bornstein, Jager, & Putnick, 2013), as results can be generalised for this specific group. In addition, rather than a bias, the homogenous characteristics of the two samples might be a reflection of a population interested in using web-based treatments for postpartum anxiety. Future work should examine characteristics of women who are interested and intend to use this form of treatment in more depth and how those women could be best reached. Future research could also specifically investigate characteristics of women who are interested in web-based treatments.

Despite Facebook and Twitter being commonly used among ethnic minorities and individuals of lower socioeconomic status (Duggan, 2015), a study found that individuals from lower socioeconomic groups were 50% less likely to access a study website compared to higher socioeconomic groups (Fenner et al., 2012). It is unclear whether Facebook is not successful in reaching a more diverse sample or whether women from other ethnic and socioeconomic backgrounds might be less interested in postpartum anxiety research and/or web-based treatments. Nonetheless, it is important to continue to recruit more diverse and often underserved populations to improve the finding's generalisability and to better understand their interest, needs and acceptability of postpartum anxiety web-based treatments.

Regarding access to primary mental health care for hard-to-reach groups, findings from a qualitative study suggest that 'communicated availability of acceptable mental health services' is a main facilitator and both the 'lack of effective information' and 'multiple forms of stigma' are barriers (Kovandžić et al., 2011). The authors further suggest that "services and information should be pluralistic, adaptive, holistic, resonant and socially conscious" (p.772) to ensure equitable access to mental health services. Similarly, it has been proposed that ethnic minority groups suffer double stigma as they are confronted with prejudice and discrimination due to their group

affiliation and faced with the stigma of mental illness (Gary, 2005). This double-stigma could be part of the reason why so few individuals from minority groups decide to seek help for mental health issues and especially postpartum women from minority groups. In addition, a review identified that various groups of Black English-speaking Caribbean immigrants in the US and UK tend to seek out more informal help and utilise spiritual beliefs and ritual practices as social support and systems of meaning for psychological distress, which may affect their interest and utilisation of formal mental health care (Yorke, Voisin, Berringer, & Alexander, 2016). Regarding perinatal mental health care specifically, findings of a focus group interview study with black Caribbean women revealed that women suggested more collaborative, community-based models of care (Edge, 2011).

In terms of research recruitment, a systematic review on barriers in ethnic minority recruitment in mental health research identified five categories of barriers (participant related, practical issues, family/community related, health service related, research process issues) and recommended that these barriers need to be considered when designing research (e.g. incorporated in research protocols and allocating appropriate resources) (Brown, Marshall, Bower, Woodham, & Waheed, 2014). In a follow-up paper to this systematic review the authors highlighted that these categories overlap and are often interlinked and recommended using multi-component strategies to overcome these barriers (Waheed, Hughes-Morley, Woodham, Allen, & Bower, 2015). The authors proposed that recruitment strategies with a cultural emphasis are needed, for example, community engagement, provision of child care, transport and incentives and additional resources (e.g. translations, adaptations, provision of multilingual staff). Similarly, culturally and linguistically appropriate recruitment might improve response rates (Bonevski et al., 2014). The participants of the patient and public involvement meeting held regarding the recruitment for iWaWa were ethnically diverse and suggested that ‘word of mouth’ and information sessions in the community (e.g. schools) might be helpful. Developing links with ethnically diverse communities to implement these suggestions was not achieved within the timeframe of this PhD research and the resources were very limited. However, future iWaWa studies should make an effort to incorporate strategies and allocate resources to address the discussed barriers. Future studies should also further investigate how recruitment, as well as web-based treatments, could be made more acceptable and available to women from different sociodemographic, economic and ethnics backgrounds.

Despite efforts to include a clinical sample and thereby increase the representativeness of the feasibility study sample, the study secured only two NHS sites. The contact person from each site was mailed posters and flyers and confirmed that posters were put up and flyers laid out. However, this resulted in no participants. Sites which would actively support the recruitment (e.g. pre-screen and invite/refer women) might have resulted in a better recruitment response. Looking at the recruitment strategies of studies from the systematic review (Chapter 2) only four out of 11 recruited a clinical sample. It would therefore be important for future studies testing such interventions to include clinical samples and explore if there might be a difference in interest, feasibility and acceptability compared to the current sample.

Feasibility methodology. Another overall limitation concerns the chosen study designs/methodologies to investigate the feasibility of web-based postpartum anxiety treatments in general and iWaWa specifically. As previously described a mixed methods approach based on two models was used for the evaluation of iWaWa. As Stage I of the Stage Model of Behavioural Therapies Research suggests, the evaluation of interest and feasibility of web-based postpartum anxiety treatments and iWaWa was focussed on exploring and assessing feasibility. This included interviews with HVs (Chapter 4 & 5), an interest and preference online survey (Chapter 6), and a randomised controlled trial which investigated study and treatment feasibility and acceptability using both qualitative and quantitative methods (Chapter 7). The studies were chosen to guarantee the feasibility of the implementation within the financial, resource and time restrictions of this PhD investigation.

Other methodologies which are often used in the feasibility stage of treatment development include focus groups and usability testing with potential users (Danaher et al., 2012). Focus groups can be in person or online. Online focus groups are a relatively new method of data collection and been shown to successfully reach difficult to reach populations for health research (Thrul, Belohlavek, Hambrick, Kaur, & Ramo, 2017; Woodyatt, Finneran, & Stephenson, 2016). Usability studies allow researchers to gain feedback on treatment completeness, relevance and functionality from potential users. Both described methodological approaches would allow to investigate further modifications of iWaWa in terms of content and presentation to increase the feasibility and acceptability of iWaWa among postpartum women. This is especially important considering the high attrition rate of the iWaWa feasibility trial and should therefore be investigated in future studies.

Implications and Future Directions

This section highlights some key implications for healthcare practice and future research emerging from the research in this thesis.

Implications for Health Care

The thesis showed that there is a multitude of web-based anxiety treatments freely available on the world wide web, but no web-based treatment specific to postpartum anxiety was found in the published academic literature or the web (Chapter 3). This thesis also demonstrated that there is an interest in web-based treatments among women with postpartum anxiety (Chapter 6 & 7). It might therefore be important for health care professionals interacting and advising postpartum women about help or treatment options for postpartum anxiety to be aware that there are web-based interventions available on the web, but that none are tailored to postpartum anxiety.

The NICE clinical guidance for antenatal and postnatal mental health states that facilitated self-help can be used for postpartum women with persistent subthreshold anxiety and anxiety disorders (NICE, 2014). iWaWa is a self-help treatment facilitated by a mental health professional, so it could potentially be used under the guidance. The long-term goal would be for future versions of iWaWa to be proven feasible, acceptable and effective. If this is achieved iWaWa could potentially be recommended in the NICE technology appraisal guidance on computerised cognitive behaviour therapy for depression and anxiety (NICE, 2013).

Health visitors in the UK are in regular contact with postpartum women and involved in the identification and management of postpartum mental health problems. Findings from this thesis showed that health visitors are aware of postpartum mental health issues and experienced a need for more treatment options specific to postpartum anxiety (Chapter 4). In terms of implementation this puts health visitors in an ideal position to disseminate information about treatments such as iWaWa. The results from Chapter 5 highlight that in order for a web-based treatment to be implemented in health visiting practice, concerns such as additional workload, training and appropriate tools (e.g. leaflets) need to be addressed.

Implications for Research

Findings from this thesis (Chapter 2, 4, 5, 6 & 7) confirm that there is currently a need for and interest in web-based interventions for postpartum anxiety. Chapter 7

also highlighted that need and interest do not necessarily result in treatment uptake and usage. Barriers and ways of improving uptake were identified in Chapter 7, but there is still a need to further explore how to improve uptake and usage of postpartum anxiety web-based interventions. Qualitative methods such as focus groups, one-on-one interviews and usability testing could be used to get a more in-depth understanding of what women with postpartum anxiety need from a web-based intervention.

Chapter 7 found that the current format of the iWaWa treatment is not yet feasible and acceptable and that several modifications are necessary to improve its feasibility and acceptability. After significant modifications to a treatment, it is important to continue with feasibility work until the treatment is optimised before proceeding to efficacy research (Ritterband et al., 2003; van Meijel, Gamel, van Swieten-Duijfjes, & Grypdonck, 2004). It is therefore important to continue with feasibility research after making modifications to iWaWa.

Even though health visitors regarded posters and flyers as the most feasible way of making women aware of postpartum web-based treatments in the capacity of their professional practice, this method did not recruit any postpartum women in the iWaWa feasibility study (Chapter 7). Chapter 6 and 7 both showed that Facebook was more successful in reaching women with postpartum anxiety for this thesis. It is therefore important to explore how women with postpartum anxiety could best be reached in non-social media settings, for example in clinics or the community. Suggested strategies for recruiting participants in clinical settings include educating staff about the research process, including staff in the research development and/or providing staff with compensations (Sullivan-Bolyai et al., 2007). This is especially important as Chapter 6 & 7 showed that Facebook recruitment attracted women from a homogenous demographic. Therefore, efforts need to continue to identify how women with postpartum anxiety from a diverse demographic could be recruited for studies testing web-based treatments and how they could be best made aware about the availability of such a treatment option. More in-depth one-to-one interviews or focus group discussions with postpartum health care professionals or community leaders might provide insight on how to best reach and recruit postpartum women including those from different demographic backgrounds. It is also important to explore if the same need and interest in web-based postpartum anxiety interventions exists in different demographics groups and to compare how their needs may differ from the samples of this thesis.

This thesis also indicates that there is a need for web-based interventions specifically designed for postpartum anxiety issues to be developed and evaluated. Chapter 6 and 7 both identify needs and preferences of women with postpartum anxiety in web-based treatments. When developing new web-based postpartum anxiety interventions, developers and researchers could make use of the preferences identified in this investigation.

Conclusions

In conclusion, the studies described in this thesis make a novel contribution to knowledge on the use of web-based self-help treatments among women with postpartum anxiety in several important ways. Combined findings suggest there is a need for and interest in web-based interventions for postpartum anxiety among postpartum women and health care professionals. Findings from the systematic review, the web search and interviews with health visitors suggest that there is currently a need for treatments specifically designed for postpartum anxiety and a web-based format of such a treatment. Both the online survey and the feasibility study established that there is an interest in such a treatment among postpartum women. However, the feasibility trial demonstrated that there are weaknesses in the current format, which could have impacted the study and treatment uptake and drop-out. Weaknesses concerned the iWaWa's content and format and the study format. The main suggested improvements included offering iWaWa as a smartphone application with the content in a brief, individualisable and inclusive format with easy to use interactive components. Overall, this body of research has contributed to knowledge regarding the need for, interest in and feasibility of postpartum anxiety web-based treatments. Thereby contributing to the understanding of evidence-based self-help treatments for postpartum anxiety.

APPENDICES

Appendix 2.1 Electronic database search terms (Chapter 2)

(postnatal OR perinatal OR postpartum OR peripartum OR antepartum OR antenatal OR prenatal OR maternal OR pregnancy OR birth OR "after birth")

AND

(Intervention OR treatment OR therap* OR self-help OR self-care OR service OR program* OR evaluation OR counseling OR counselling OR psychotherap* OR bibliotherapy OR self-treatment OR behaviour-change OR behavior-change OR CBT OR self-directed OR cognitive-behavioral OR cognitive-behavioural OR prevention OR promotion)

AND

(Well-being OR "mental health" OR "mental disorder" OR psychopathology OR "psychological disorder" OR anxiety OR fear OR panic OR phobia OR agoraphobia OR obsessive-compulsive OR "post-traumatic stress disorder" OR PTSD OR trauma OR stress OR depression OR affective OR mood OR emotion* OR mania OR bipolar OR unipolar OR dysthymia OR "baby blues" OR sleep OR insomnia OR psychosis OR schizophrenia OR delusional OR schizoaffective OR "eating disorder" OR anorexia OR bulimia OR binge OR psychosocial)

AND

(Internet OR computer OR computer* OR online OR web OR e-therapy OR e-mental OR e-health OR telehealth OR telecare OR teletherapy OR telemedicine OR telemental OR technolog* OR virtual OR cyber OR cyberpsychology OR cybertherapy OR iCBT OR cCBT OR web-based OR web-guided OR web-supported OR web-delivered OR web-assisted OR web-aided OR web-facilitated OR computer-based OR computer-guided OR computer-supported OR computer-delivered OR computer-assisted OR computer-aided OR computer-facilitated OR internet-based OR internet-guided OR internet-supported OR internet-delivered OR internet-assisted OR internet-aided OR internet-facilitated OR online-based OR online-guided OR online-supported OR online-delivered OR online-assisted OR online-aided OR online-facilitated)

Appendix 2.2 Inter-rater percent agreement and Cohen's Kappa for each included study (Chapter 2)

	% Agreement	Cohen's Kappa	N Agreements
Cornsweet Barber et al. (2013)	100	1	14
Danaher et al. (2013)	92.9	0.88	13
Klein et al. (2012)	100	1	14
Kersting et al. (2011)	100	1	14
Kersting et al. (2013)	92.9	0.85	13
Kim et al. (2014)	92.9	0.83	13
King (2009)	100	1	14
Pugh (2014)	92.9	0.83	13
O'Mahen et al. (2013)	100	1	14
O'Mahen et al. (2014)	92.9	0.77	13
Scherer et al. (2013)	100	1	14

Appendix 3.1 Search log (Chapter 3)

Search Engine	Search Terms	Search Date	No. of Returned Hits	No. of Websites of Programs	No. of Websites linking to Programs	No. of Ads per 25 Hyperlinks
Google	Internet therapy anxiety	3/11/2015	42,100,000	10	3	6
Google	Internet treatment anxiety	3/11/2015	57,600,000	4	2	6
Google	Internet cognitive behavioural therapy anxiety	3/11/2015	2,260,000	7	3	6
Google	Online therapy anxiety	3/11/2015	19,100,000	13	2	6
Google	Online treatment anxiety	3/11/2015	115,000,000	14	2	6
Google	Online cognitive behavioural therapy anxiety	3/11/2015	7,450,000	12	4	6
Google	Web therapy anxiety	3/11/2015	13,400,000	2	0	6
Google	Web treatment anxiety	3/11/2015	71,300,000	3	0	6
Google	Web cognitive behavioural therapy anxiety	3/11/2015	2,700,000	7	3	6
Bing	Internet therapy anxiety	3/12/2015	6,310,000	8	1	6
Bing	Internet treatment anxiety	3/12/2015	23,000,000	8	3	5
Bing	Internet cognitive behavioural therapy anxiety	3/12/2015	3,620,000	8	1	5
Bing	Online therapy anxiety	3/12/2015	63,800,000	10	1	5
Bing	Online treatment anxiety	3/12/2015	36,300,000	9	3	4
Bing	Online cognitive behavioural therapy anxiety	3/12/2015	5,260,000	5	1	5
Bing	Web therapy anxiety	3/12/2015	4,380,000	0	1	4
Bing	Web treatment anxiety	3/12/2015	33,100,000	3	1	2
Bing	Web cognitive behavioural therapy anxiety	3/12/2015	4,680,000	3	2	4
Yahoo	Internet therapy anxiety	3/13/2015	6,190,000	4	1	9
Yahoo	Internet treatment anxiety	3/13/2015	23,000,000	8	2	12
Yahoo	Internet cognitive behavioural therapy anxiety	3/13/2015	3,600,000	4	1	9
Yahoo	Online therapy anxiety	3/13/2015	63,800,000	8	1	12
Yahoo	Online treatment anxiety	3/13/2015	36,200,000	9	2	9
Yahoo	Online cognitive behavioural therapy anxiety	3/13/2015	5,200,000	8	1	12
Yahoo	Web therapy anxiety	3/13/2015	4,370,000	0	0	10
Yahoo	Web treatment anxiety	3/13/2015	33,300,000	2	0	11
Yahoo	Web cognitive behavioural therapy anxiety	3/13/2015	4,660,000	4	2	12

Appendix 3.2 Screenshots of programs (Chapter 3)

AI-Therapy (#1)

AI-THERAPY

THE PROGRAM - SOCIAL ANXIETY - OTHER PAGES - BLOG - LOGIN - SIGN UP

Overcome social anxiety.

An online treatment program that uses evidence-based techniques and award winning research to help you overcome social anxiety.

Click above to watch Fjola and Ross explain the system.

AI-Therapy creates a virtual relationship between you and Ross and Fjola, two internationally renowned anxiety experts. Find out more about Fjola and Ross.

Pre-Questionnaires

- I: Thinking Exercises
 - Welcome!
 - What causes us to feel anxious?
 - Thinking exercise 1.1
 - Thinking exercise 1.2
 - Thinking exercise 1.3
 - What is a 'causal' thought?
 - Causal thoughts
 - Checklist of cognitive errors
 - Thinking exercise 2.1
 - Thinking exercise 2.2
- II: Challenging Your Thinking
- III: Creating Your Model
- IV: Behavioural Experiments
- V: Challenge Your Thinking Further
- VI: Self-Processing

Welcome!

Thanks a lot for taking the time to fill out those questionnaires. Now it's time to learn a little more about us, and how the program works.

Welcome Message

We are Fjola in Oxford, UK and Ross in Sydney, Australia, and we have been working on this project for several years. Please press the play button so we can introduce ourselves.

Beating the Blues (#2)

beating the blues

Home - Patients - Practitioners - Login - Activate

Buy Now - More Information - Videos - Download Leaflet - Find Out More - Overview - Demo

Feeling down or anxious? Beating the Blues 24/7 can help...

Beating the Blues® is an effective treatment for people feeling stressed, depressed, anxious or just down in the dumps. Based on Cognitive Behavioural Therapy, the course is made up of 8 online sessions which last approximately an hour and help you to understand the link between how you think and how this influences your feelings and behaviours. The program teaches strategies to help you cope better in the short term and workable skills for life so that you can face the future with confidence.

Pleasurable activity

How many pleasurable things did you do last week?

None
1
2 to 4
More than 4

1.00%
Download: 1.2MB

Blues Begone (#3)



Blues Begone
to help you feel better

100% MONEY BACK GUARANTEE

Home About Buy Professionals FAQs Guarantee Testimonials Press Contact Us

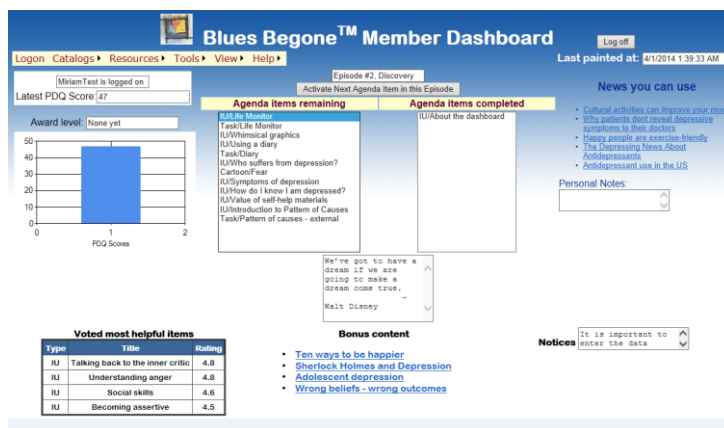
Depression
About Depression
Clinical Help
Symptoms of depression
Anxiety
Anxiety treatment
CBT
Cognitive Behaviour Therapy
Computerized CBT Therapy

Blues Begone helps treat depression and anxiety

Get free help every week

Are you feeling depressed or anxious ?

- help yourself beat depression and anxiety quickly
- use the most effective type of treatment available
- use it when and where you like to beat depression and anxiety
- beat depression and anxiety without waiting to see a doctor or a



Blues Begone™ Member Dashboard

Logon Catalogs Resources Tools View Help

Miriam Test is logged on

Episode #2, Discovery

Activate Next Agenda Item in this Episode

Latest PDQ Score: 47

Award level: None yet

PDQ Scores: 0, 1, 2

Agenda items remaining:

- Task/Use Monitor
- UI/Whimsical graphics
- UI/Using a diary
- Task/Cher
- UI/Who suffers from depression?
- Carbon/Fear
- UI/Symptoms of depression
- UI/How do I know I am depressed?
- UI/Value of self-help materials
- UI/Introduction to Pattern of Causes
- Task/Pattern of causes - external

Agenda items completed:

- UI/About the dashboard

News you can use:

- Cultural activities can improve your mood
- Why patients don't reveal depressive symptoms to their doctors
- Happy people are exercise-friendly
- The Depressing News About Antidepressants
- Antidepressant use in the US

Personal Notes:

Notices: It is important to enter the data

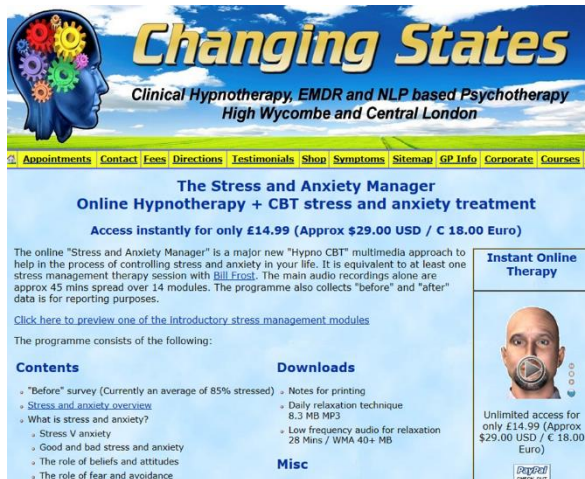
Voted most helpful items:

Type	Title	Rating
UI	Talking back to the inner critic	4.8
UI	Understanding anger	4.8
UI	Social skills	4.6
UI	Becoming assertive	4.5

Bonus content:

- Ten ways to be happier
- Shakespeare, Holmes and Depression
- Adolescent depression
- Wrong beliefs - wrong outcomes

Changing States - The Stress and Anxiety Manager (#4)



Changing States
Clinical Hypnotherapy, EMDR and NLP based Psychotherapy
High Wycombe and Central London

Appointments Contact Fees Directions Testimonials Shop Symptoms Sitemap GP Info Corporate Courses

The Stress and Anxiety Manager
Online Hypnotherapy + CBT stress and anxiety treatment

Access instantly for only £14.99 (Approx \$29.00 USD / € 18.00 Euro)

The online "Stress and Anxiety Manager" is a major new "Hypno CBT" multimedia approach to help in the process of controlling stress and anxiety in your life. It is equivalent to at least one stress management therapy session with Bill Frost. The main audio recordings alone are approx 45 mins spread over 14 modules. The programme also collects "before" and "after" data is for reporting purposes.

Click here to preview one of the introductory stress management modules

The programme consists of the following:

Contents:

- "Before" survey (Currently an average of 85% stressed)
- Stress and anxiety overview
- What is stress and anxiety?
 - Stress v anxiety
 - Good and bad stress and anxiety
 - The role of beliefs and attitudes
 - The role of fear and avoidance

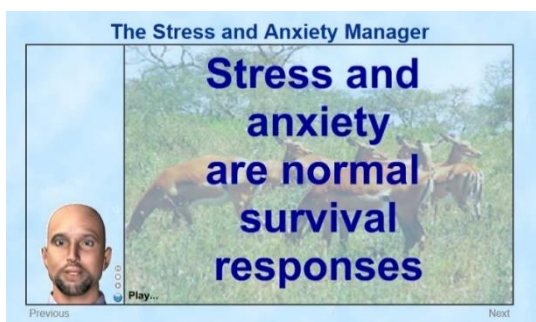
Downloads:

- Notes for printing
- Daily relaxation technique (8.3 MB MP3)
- Low frequency audio for relaxation (28 Mins / WMA 40+ MB)

Misc:

Instant Online Therapy

Unlimited access for only £14.99 (Approx \$29.00 USD / € 18.00 Euro)



The Stress and Anxiety Manager

Stress and anxiety are normal survival responses

Previous Play... Next

CBT 7 Step Self Help Course (#5)

Step 1 Step 2 Step 3 Step 4 Step 5 Step 6 Step 7

The documents linked from the bottom of each page are intended to be an integral part of this course, and should not be omitted - the worksheet documents are included in the downloadable Steps linked above.

Please click here if you would like additional support in completing any of the steps of the CBT Self-Help Course

This mini 7-step self-help course includes techniques which could be useful for all, but professional help should be sought for complex or long-standing problems.

Use the Self Help mp3 downloads to strengthen therapy or as a stand-alone technique

Once you've read through the introduction to CBT on this page, you can start to look at what's helping to keep your problems going.



Let's use a recent example, when you've been distressed - perhaps something has happened in the past week or so when you've felt particularly anxious, angry, or depressed.



What was the situation? What happened? When did it happen? What else was going on? Was it a situation that you often find yourself in? Who were you with?

What thoughts or images went through your mind just before or during that time? If you had that thought, what did that mean to you, or what did that say about you or the situation? If your thought was a question, try to answer it. What disturbed me?



CCBT Limited – FearFighter (#6)

Founded in 2005, CCBT Limited is an innovator and world leader in delivering evidence based computer-aided cognitive behavioural therapy (CCBT). The FearFighter™ Treatment is the only product endorsed by a national regulator (NICE in the UK - TA267) for an Anxiety Treatment. In 2010 the company released its Calmer Series (a suite of psycho-education products) and announced the release of new products for OCD, Depression, Substance Abuse and Insomnia. Already at the forefront of providing online psychiatric treatments and self help, we are now leading the market as the developer of choice for clinicians wishing to take their treatments to larger communities and establishing our healthcare platform as the leading international platform for treatment delivery.

Product Features

- Multi step interventions
- 2 to 9 hours of online treatment time (dependent upon condition)
- Full outcome measurement tracking
- Patient management and governance module (Enterprise Product)
- Patient support options, eMail, Telephone and Face to Face
- 60% reduction in therapist time
- Financial savings of over 50% of equivalent treatment for equivalent outcome

eCentreClinic - Mood Mechanic Course (#7)

eCouch - Anxiety & Worry Program (#8, #9)

Learn to Live (#10)

Livanda - Free from Anxiety (#11)

Living Life to the Full (#12)

Living Life to the Full
...helping you to help yourself

Not yet a member? - sign-up FREE now | Log In | Technical FAQs | Contact Us | Escape to LITF

Problems signing up? Report a problem

Home
Practitioner Training
Practitioner Resources
About this Site
Get LLTTF Support
Live LLTTF Stats
Living Life Shop

Click to play

URGENT HELP!
Contact Us

Join Our Mailing List | Already Registered? login here: [Login](#)

Be Happier, Sleep Better, Do More, Feel More Confident

Why do I feel so bad?
This session helps you understand your feelings and what to do about them.

Try these sample sessions now.
Just click one that interests you or fits how you feel.

I can't be bothered doing anything
This session helps you break out of the cycle and start to feel great.

How to fix almost everything
The Easy 4 Step Plan - a way to deal with problems and achieve your goals.

10 things that make you feel happier straight away
How to be happier, fitter and more successful in a bit shorter time span.

I'm not good enough
How some other people seem so confident? Learn their secrets and get to like yourself again.

Register Now! Public Sign-up | **Register Now! Practitioner Sign-up**

My Living Life
Practitioner Training
Practitioner Resources

Downloads
About this Site
Get LLTTF Support
Understanding Your Mood
Live LLTTF Stats
Living Life Shop

Click to play

URGENT HELP!
Contact Us

PANIC BUTTON
Click here if you're feeling scared right now

Join Our Mailing List
Enter email address:

Go

Privacy by [EUF SafeSubscribe™](#)
Google™ Custom Search
 Search

My Support Area

My Profile & Settings | My Support Practitioner
My Mood Results | My Support Forum
LLTTF Member Course Resources | Read Courses on Kindle

Available Courses:

Welcome
Welcome to the site (read this first). It's tempting to just crack on and start a course. Learn how to get the most from the site courses and resources.
[Start Welcome Course](#)

Little Book
(Based on your stated learning style - we recommend this course)
Accessible, attractive and to the point, this exciting range of new modules have been carefully designed to communicate key points that can help you change things around quickly. Buy copies of the Little Books (£15 for any 10 including delivery).
[Start Little Book Course](#)

Mental Health Online - Generalised Anxiety Disorder (#13, #14, #15)

GAD Online

Welcome to GAD Online!

Getting the most from this program

The GAD Online program for Generalised Anxiety Disorder (GAD) is designed to:

- Help you understand the nature of anxiety and worry
- Teach you strategies to overcome GAD, based on cognitive behaviour therapy (CBT)

You have 12 weeks to complete the program, which contains 12 modules. It is recommended that you spend 1 week per module going through the online module and completing the offline activities.

As part of the therapist-assisted stream of this program you will also receive regular email assistance from a therapist. You can contact your therapist when you like and your therapist will respond in a weekly email over the 12 weeks.

Click on the 'Next' link below to begin the GAD Online program.

Next: [Module 1: Understanding Generalised Anxiety Disorder >](#)

Module 1: Understanding Generalised Anxiety Disorder
Module 2: Relaxation, part 1
Module 2: Relaxation, part 2
Module 4: Our thoughts, the thinking-behaving relationship
Module 5: Our thoughts, challenging and changing thoughts
Module 6: Coping with worry
Module 7: Problem solving
Module 8: Approach and avoidance, part 1
Module 9: Approach and avoidance, part 2
Module 10: Lifestyle factors, part 1
Module 11: Lifestyle factors, part 2
Module 12: Maintaining GADs
Bibliography and program development

Mood Control (#16)

Mood Control
Recover from Depression and Anxiety

Let me explain how you can recover from depression and anxiety

Be sure to find the \$1 offer

Every day sufferers from depression and anxiety are able to reclaim their lives. By following a well designed program of change over a series of weeks, the neural networks that create and maintain depression and anxiety are replaced with normal and natural patterns of feelings, thoughts and behaviors. Restoring your brain like this is a reliable, repeatable and sure way to feeling better, functioning better and regaining your place in the world.

CBT is effective

MOOD control + GOLD

Dashboard | The CBT System Course | Bonus material | Additional resources | Special features | Active Self resp | Worry | Tip and tools to feel better

Welcome to Mood Control

Bonus material
Why you should take more care of yourself on May 20, 2013

Special features
The Active Self Help Way Out of Depression on May 20, 2013

Bonus material
How to step out of bad feelings on November 30, 2012

Stamping on ANTs
It's all lies anyway (Stamping on ANTs part 2) on December 12, 2011

Stamping on ANTs
Losing that inner critical voice (Stamping on ANTs Part 1) on December 12, 2011

Additional resources
30 Day Money Back Guarantee on April 7, 2011

Additional resources
Dr David Purves: A little about my Journey on January 14, 2011

MoodGYM (#17)

myCompass (#18)

Managing Fear & Anxiety

Anxiety is 'fear that lasts' – and too much anxiety interferes with our well-being and enjoyment of life. First this module helps you analyse what sets off your anxiety and what maintains it. Understanding your anxiety is the first key to managing it. Then it explores the steps you can take to prevent or manage anxiety so that it doesn't take over.

Who is it for?

This module is for people who would like to improve the way they manage anxiety in their lives. We know that some anxiety is normal and useful if it motivates us to action. But sometimes we find ourselves feeling anxious in situations where we don't need to be. It's as if the body doesn't react itself to a calm state once the threat or danger is past. We call this having mild to moderate anxiety difficulties.

Why should you do it?

While anxiety isn't harmful, it feels very unpleasant, it can interfere in our lives and when extreme it doesn't really help us solve problems. People can develop anxiety for a number of reasons, usually related to their life circumstances and current stresses. Some people are just more prone to developing anxiety. It runs in the family. Regardless of how your anxiety developed, you can learn to understand and manage it better. This module encourages you to develop an awareness of what sets off your anxiety, so that you can take steps to prevent or prepare for it.

Module Structure

Duration: 2-3 weeks
Home tasks: Leave a week between the module sessions to complete the home tasks and apply the module information to your situation. If you don't do the home tasks you may miss out on finding out something new about yourself.

Session 1	Session 2	Session 3
<p>Areas Covered: Introduction to Managing Fear & Anxiety; Anxiety warning signs; Anxiety disorders; How to recognise anxiety; Understanding the situational triggers of anxiety.</p> <p>16 minutes</p> <p>Home task: Monitoring of 3 anxiety episodes.</p> <p>8 minutes per episode</p>	<p>Areas Covered: The places, people and things that affect your anxiety; Managing anxiety through breathing; Understanding the thoughts and other factors that lead to anxiety.</p> <p>14 minutes</p> <p>Home task: Monitoring another 3 anxiety episodes.</p> <p>8 minutes per episode</p>	<p>Areas Covered: The thoughts and other factors that trigger anxiety; Identifying unhelpful thoughts.</p> <p>10 minutes</p>

Modules List

- [Managing Fear & Anxiety](#)
- [Setting SMART Goals](#)
- [Improving Sleep and Anxiety](#)
- [Stressors](#)
- [Managing Loss & Major Life Changes](#)
- [Managing a Family Member's Anxiety](#)
- [Managing Stress & Depression](#)
- [Communicating Clearly](#)
- [Positive Psychology](#)
- [Positive Psychology & Wellbeing](#)
- [Positive Psychology: Theories](#)
- [The ABCs of your anxiety](#)

Further Reading

[The control of your worry](#) Dr Lisa Lerner

Online Therapy (#19, #20, #21 , #22 , #23 , #24)

Overcome Your Anxiety with Online Therapy

Now only £19.95 weeks

- ✓ Your own qualified therapist; communicate daily via worksheets + access to chat
- ✓ Evidence-based online therapy program
- ✓ Easy-to-follow information & tools in each section
- ✓ Forum to get help from others
- ✓ Tests to see your progress

To get the best out of the program we recommend that you use our services during 8 weeks, but that is totally up to you. You decide if you need help for a longer or shorter time. Our therapy for anxiety is based on cognitive behavioral therapy (CBT).

Online CBT for Anxiety

It's not external events that trigger your anxiety; instead it's how you feel and perceive the events that cause your anxiety. Using our online therapy for anxiety you'll learn how to identify your negative thinking patterns that cause your anxiety and replace them with realistic and more positive thoughts. CBT online will help you learn to recognize when you're anxious and how this feels emotionally and physically, but more importantly you will learn coping skills to neutralize this anxiety. Your therapist will help you to gradually and repeatedly expose yourself to the situations and fears that normally trigger your anxiety. Eventually you will be able to go through these events without experiencing the anxiety that up to this point has limited your quality of life.

Click on the links below to learn more or to get started right away.

[How it works >](#) [Get Started! >](#)

Worksheet: Session 3 - My unhealthy behaviors

Unhealthy behaviors
Our unhealthy behaviors work as coping strategies and whilst they may seem effective at first, they are actually just causing damage over the longer term by fueling the anxiety. Write down your unhealthy behaviors.

You wrote: 2014-04-29 (15:50)
Only sleeping a few hours per night
Not eat enough food
Overload myself with work

Add a new comment

[Back \(don't save\)](#) [Continue >](#)

Serenity Program - Anxiety Program (#25)

Serenity Programme CBT@Home!

Home About Us Contact Us Brief Programme Login Tel: 07092 238031 Twitter

The Serenity Programme - Begin your recovery today!

Use the menu to the right to take our free **psychological tests**, to take part in our new **brief self-help programme** & view our new **information microsite**. Registered members can access our **self-help CBT workbooks**.

Use of this site is free. A password is required to use our full programme (designed to be used with extra support). Passwords are available through our partner organisations, Cwm Taf and North Wales primary care services, and through **Parabl** in North Wales.

We're proud to say we have helped 76,347 people recover from anxiety disorders since July 4th 2010.

Innovative online CBT workbooks

Anxiety programme

Click the buttons below to continue ...

- Programme Introduction
- Becoming different
- Everything's connected
- Learning to relax
- Dealing with troubling feelings
- Dealing with troubling thoughts
- Problem solving
- Staying well

Social Anxiety Institute (#26)

Social Anxiety INSTITUTE

WHAT IS SOCIAL ANXIETY? ONLINE THERAPY TREATMENT VIDEOS SUCCESSES BOOKS TEST NEWSLETTER FORUM

Overcome your Social Anxiety
with our leading online treatment program

Our 25 Session series includes:

- Audio Therapy
- Therapy Handouts
- Videos Explanations of the Therapy
- Supplemental Handouts and Materials
- Songs re-inforcing therapy concepts
- Motivational Quizzes
- Discussions for each session

This Way Up Clinic (#27, #28, #29, #30)

This Way Up Self-help (#31, #32)

This Way Up School (#33, #34)



THIS WAY UP
Online treatment, education and research in anxiety and depression.

At **THIS WAY UP**, we empower individuals by giving them access to online help for anxiety and depression.

Getting started is easy with our new service finder.

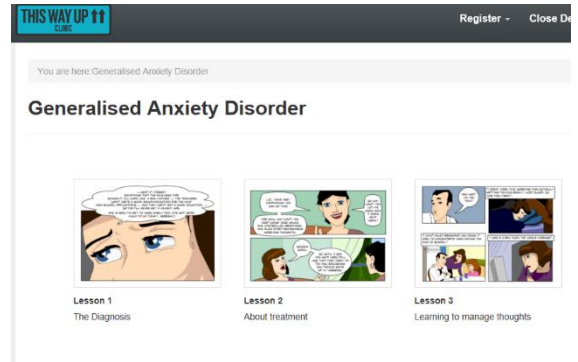
[GET STARTED](#)

THIS WAY UP CLINIC
THIS WAY UP Clinic is an online clinician assisted treatment program for anxiety and depression. Validated with an 80% success rate, you will receive support from your clinician and 90 days access to our proven program.

SELF HELP
Learn more about anxiety and depression at THIS WAY UP Self Help. Take a free test or enrol in one of our self-paced courses. We provide skill building courses for worry, sadness and shyness.

FOR CLINICIANS
We provide information and technical training for clinicians. Read our guides to common mental disorders, psychological strategies and outcome measures. Our guides are written by clinical and academic experts from (DSU)SEI.

FOR SCHOOLS
An internet based learning system that provides health and wellbeing courses for school students. Enrol your school to get free access to skill building courses to manage stress, anxiety and depression.



THIS WAY UP **11**
GAS

Register - Close De

You are here: Generalised Anxiety Disorder

Generalised Anxiety Disorder

Lesson 1
The Diagnosis

Lesson 2
About treatment

Lesson 3
Learning to manage thoughts

Appendix 3.3 Program evaluation scores for each program (Chapter 3)

Program	1. Was counting 2. Was a unique password or PIN provided to users?	3. Were the names of the program or author specified?	4. Were contact details provided?	5. Was a description specified?	6. Were the primary objectives of the program specified?	7. Was evidence for the program's effectiveness (e.g. additional data, success rates, user completion rates) # of users in the program?	8. Were the primary objectives of the intervention stated?	9. Was specified for which symptoms this program is designed for?	10. Were the program modules or time to complete each module stated?	11. Was the program generic for all users?	12. Did the program offer a combination of text, video, graphics and audio formats?	13. Was the program available on any devices (e.g. smartphone, tablet, computer)?	14. Was the model of care (e.g. self-help, guided self-help) defined/stated?	15. Was information on the program's development provided (e.g. names of developers, funding, etc.)	16. Has the program been validated?	Score
#1 - AI Therapy	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6 out of 16, 38.0%
#2 - Beating the Blues	1	1	1	1	1	1	1	1	1	0a	1	1	1	1	1	9 out of 16, 56.2%
#3 - Bored Bopline	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14 out of 16, 87.5%
#4 - Changing States - The State of Mind Program	1	0a	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#5 - CBT 7 Step Self Help Course	1	0	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#6 - CCBT Limited - Fearfighter	1	0	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#7 - eCereChic - Mood Machine Course	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	9 out of 16, 56.2%
#8 - eCereChic - Anxiety & Worry Program	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	9 out of 16, 56.2%
#9 - eCereChic - Social Anxiety Program	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	9 out of 16, 56.2%
#10 - Learn to Live	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	9 out of 16, 56.2%
#11 - Maudsley - Free from Anxiety	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#12 - Living Life to the Full	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#13 - Mental Health Online - Generalised Anxiety Disorder	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#14 - Mental Health Online - Social Anxiety Disorder	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#15 - Mental Health Online - Panic Disorder without Agoraphobia	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#16 - MoodControl	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#17 - MoodGlam	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#18 - mpCompass	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#19 - Online Therapy - Anxiety	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#20 - Online Therapy - Generalised Anxiety	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#21 - Online Therapy - Panic Attacks	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#22 - Online Therapy - Agoraphobia	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#23 - Online Therapy - Social Anxiety	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#24 - Online Therapy - Speech Anxiety	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#25 - Serenity Program - Anxiety Program	1	0	1	1	1	1	1	1	1	0	1	1	1	1	0	11 out of 16, 68.8%
#26 - Social Anxiety Iterate	1	1	1	1	1	1	1	1	1	0a	1	1	1	1	0	11 out of 16, 68.8%
#27 - This Way Up Clinic - Worry	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	14 out of 16, 87.5%
#28 - This Way Up Clinic - Sleep and Stress	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	14 out of 16, 87.5%
#29 - This Way Up Clinic - Panic	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	14 out of 16, 87.5%
#30 - This Way Up Clinic - Shame	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	14 out of 16, 87.5%
#31 - This Way Up Self-help Shame	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	14 out of 16, 87.5%
#32 - This Way Up Self-help - Worry and Sadness	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	14 out of 16, 87.5%
#33 - This Way Up School - Overcoming Social Anxiety	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	14 out of 16, 87.5%
#34 - This Way Up School - Anxiety and Depression for Adolescents	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	14 out of 16, 87.5%
Sum	28	30	31	31	31	30	31	31	31	4	33	34	29	34	31	39

Appendix 4.1 Ethical approval letter City, University London (Chapter 4 & 5)



School of Health Sciences

Ref: PhD/14-15/11

Research Office
Northampton Square
London EC1V 0HB

20 March 2015

Tel: +44 (0) 20 7040 5704

www.city.ac.uk

Dear Miriam / Susan / Ellinor

Re: Health visitors' views of web-based treatment for postpartum mental health issues

Thank you for forwarding amendments and clarifications regarding your project. These have now been reviewed **and approved** by the Chair of the School Research Ethics Committee.

Please find attached, details of the full indemnity cover for your study.

Under the School Research Governance guidelines you are requested to contact myself once the project has been completed, and may be asked to complete a brief progress report six months after registering the project with the School.

If you have any queries please do not hesitate to contact me as below.

Yours sincerely



Alison Welton
Research Governance Officer

Appendix 4.2 Sociodemographic questionnaire (Chapter 4 & 5)

Information About You

We would like to ask some questions about you. These questions are optional, so if you would prefer not to answer these questions, please had this sheet back to the researcher.

What is your age?					
Please indicate your gender:		<input type="checkbox"/> male	<input type="checkbox"/> female	<input type="checkbox"/> Prefer not to disclose	
<input type="checkbox"/> Other - Please specify:					
Please indicate your ethnicity:					
<input type="checkbox"/> White	<input type="checkbox"/> Mixed/ Multiple ethnic groups	<input type="checkbox"/> Asian	<input type="checkbox"/> Black/African/C aribbean	<input type="checkbox"/> Chinese	<input type="checkbox"/> Arab
<input type="checkbox"/> Other ethnic group - Please specify:					
In which Trust do you currently work?					
How long have you worked as a Health Visitor?					

Thank you!

Appendix 4.3 Interview schedule (Chapter 4 & 5)

Interview schedule for health visitors

Opening

Your experience working with women in the postpartum period as a health visitor is important to us for development and implementation for mental health interventions to support women in this period. Therefore, we'd like to ask you a few questions to get to know more about your opinions about web-based mental health intervention in general and the What Am I Worried About (iWaWa) intervention and how they could be implemented in practice. The interview will take about 30 minutes; it will be audio-recorded and I will take a few notes. Your participation in this interview voluntary. You can withdraw at any stage and do not have to tell me your reasons for doing so without being penalised or disadvantaged in any way. You can also choose not to answer any question that you do not want to answer.

Let's start with a few general questions about your current practice.

A. Current care

- How do you currently support mothers with mental health problems?
- What are your thoughts on the current treatments and care provided for postnatal women with mental health problems?
- Can you give me an example how you support women with postnatal mental health problems?
- What experiences do you have working with women suffering from postnatal anxiety specifically?
- Can you give me an example how you support women with postnatal anxiety?

B. General impressions and opinions

- Tell me about your thoughts on web-based mental health treatments from your professional perspective.
- Tell me about your general impressions and opinions about iWaWa.

C. Usefulness

- Based on your personal experience working with postnatal women do you think these women would use web-based self-help, such as iWaWa?

D. Acceptability

- Based on your personal experience working with postnatal women, do you think these women would like web-based self-help, such as iWaWa?

E. Effectiveness

- Based on your personal experience working with postnatal women, do you think web-based self-help, such as iWaWa would help these women with their anxiety?

E. Issues

- If any, do you see any issues or problems that women using web-based self-help might encounter and if so, how could those be improved?

F. Improvements

- What do you think is the best and worst feature of web-based treatments and iWaWa?
- How can we change iWaWa to make it better or more effective?

G. Implementation

- What do you think is needed for web-based treatments to be a part of standard care?
- Do you think that it is feasible?

F. Background

- Tell me about your professional background.

Finish

- Do you have any other comments about what we have talked about today?

Thank you for taking the time to take part in my study!

Appendix 6.1 Copy of online survey questions (Chapter 6)

The next couple of questions are going to ask you about your mood and feelings. How often have you been bothered by the following problems?

	Not at all	Several days	More than half the days	Nearly every day
Feeling nervous, anxious or on the edge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not able to stop or control worrying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worrying too much about different things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble relaxing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being so restless that it is hard to sit still	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming easily annoyed or irritable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling afraid as if something awful might happen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How did you hear about this study? (Multiple answers possible)

- Facebook
- Twitter
- Forum, please specify: _____
- Website, please specify: _____
- Friend
- Other, please specify: _____

How often do you use the Internet?

- Never
- Less than once a week
- Once a week
- 2-3 times a week
- 3-5 times a week
- Daily

Do you have access to a desktop computer?

- yes
- no

Display This Question:

If Do you have access to a desktop computer? yes Is Selected

How often do you use the desktop computer?

- Never
- Less than once a week
- Once a week
- 2-3 times a week
- 3-5 times a week
- Daily

Do you have access to a laptop?

- yes
- no

Display This Question:

If Do you have access to a laptop? yes Is Selected

How often do you use the laptop?

- Never
- Less than once a week
- Once a week
- 2-3 times a week
- 3-5 times a week
- Daily

Do you have access to a tablet? (e.g. iPad)

- yes
- no

Display This Question:

If Do you have access to a tablet? yes Is Selected

How often do you use the tablet?

- Never
- Less than once a week
- Once a week
- 2-3 times a week
- 3-5 times a week
- Daily

Do you have access to a smartphone?

- yes
- no

Display This Question:

If Do you have access to a smartphone? yes Is Selected

How often do you use the smartphone?

- Never
- Less than once a week
- Once a week
- 2-3 times a week
- 3-5 times a week
- Daily

	yes	no
Family members	<input type="radio"/>	<input type="radio"/>
Friends	<input type="radio"/>	<input type="radio"/>
General Practitioner	<input type="radio"/>	<input type="radio"/>
Psychologist/Psychiatrists	<input type="radio"/>	<input type="radio"/>
Counsellor	<input type="radio"/>	<input type="radio"/>
Telephone counseling	<input type="radio"/>	<input type="radio"/>
Self-help books	<input type="radio"/>	<input type="radio"/>
Online counseling via Skype, email or live chat	<input type="radio"/>	<input type="radio"/>
Websites	<input type="radio"/>	<input type="radio"/>
Online forums	<input type="radio"/>	<input type="radio"/>
Website-based psychotherapy program without support from a therapist	<input type="radio"/>	<input type="radio"/>
Website-based psychotherapy with therapist support	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>

Have you ever sought information or help for mental health problems (such as depression, anxiety, etc.) from any of the following sources?

How helpful did you find the information/help you received?

	Not helpful	Somewhat helpful	Very helpful	Don't know	Not applicable
Family members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
General Practitioner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Psychologist/Psychiatrists	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Counsellor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Telephone counseling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-help books	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online counseling via Skype, email or live chat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online forums	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Website-based psychotherapy program without support from a therapist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Website-based psychotherapy with therapist support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Click to write Statement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Your support - Please read each statement carefully and indicate how you feel about each statement. There are no right or wrong answers.

	Very strongly disagree	Strongly disagree	Mildly disagree	Neutral	Midly agree	Strongly Agree	Very strongly agree
There is a special person who is around when I am in need.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a special person with whom I can share my joys and sorrows.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My family really tries to help me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get the emotional help and support I need from my family.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a special person who is a real source of comfort to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My friends really try to help me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can count on my friends when things go wrong.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can talk about my problems with my family.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have friends with whom I can share my joys and sorrows.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a special person in my life who cares about my feelings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

My family is willing to help me make decisions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can talk about my problems with my friends.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

We are developing a web-based self-help treatment for women like you who feel anxious during the first 12 months after giving birth. This self-help treatment is a treatment that gives you the option to work through therapy materials online without help, or with minimal support from a health professional. Women will be able to register with the treatment website and login and access the therapy material online. Internet-based treatments come in various formats. In order to create the best treatment possible, we would like to know what formats and features you like the most. The following questions will ask you to rate several proposed program formats and features for which ones you prefer.

If we were to offer a website-based treatment without occasional support from a therapist or other health professional

Would you be interested in using it?

- Definitely not
- Probably not
- Maybe
- Probably yes
- Definitely yes
- Don't know

How likely would you be to use it?

- Extremely unlikely
- Somewhat unlikely
- Neither unlikely nor likely
- Somewhat likely
- Extremely likely
- Don't know

If we were to offer a website-based treatment with occasional support from a therapist or other health professional

Would you be interested in using it?

- Definitely not
- Probably not
- Maybe
- Probably yes
- Definitely yes
- Don't know

How likely would you be to use it?

- Extremely unlikely
- Somewhat unlikely
- Neither unlikely nor likely
- Somewhat likely
- Extremely likely
- Don't know

How would you like to receive support or be in contact with a therapist?:

	Yes	No	Don't know
Email	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instant messaging/chat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Phone calls	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Skype calls	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How often would you like to receive therapist support?

- Never
- Once a month
- Every other week
- Once a week
- Twice a week
- 3-4 times a week
- 5-6 times a week
- As often as needed
- Don't know

Would you like any of the following features to be part of the treatment?:

	Yes	No	Don't know
Videos to demonstrate skills you are learning during the self-help program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stories from mothers with anxiety.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Audio recordings from relaxation exercises.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Home-work tasks for you to fill in online. Example: http://tinyurl.com/nv56n6o	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Home-work tasks to download & print so you can fill them in on paper.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Live chat room with other women doing the online treatment (instant messaging)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online forum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online diary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Email reminders for unfinished or future sessions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SMS reminders for unfinished or future sessions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anxiety rating and graphical display over time. Example rating scale: http://tinyurl.com/le96az8 Example graphical display over time: http://tinyurl.com/oebfk8q	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How likely would you be to use the treatment in the following format?

	Extremely unlikely	Somewhat unlikely	Neither unlikely or likely	Somewhat likely	Extremely likely	Don't know
As a website	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
As a smartphone/tablet application	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
As both a website and application	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you had to choose, what would be your preferred way of accessing the treatment?

- Website
- Smartphone/tablet application
- Both website and application

How much time would you be willing to spend using the program at a time?

- 0-5 minutes at a time
- 5-15 minutes at a time
- 15-30 minutes at a time
- 30-45 minutes at a time
- 45-60 minutes at a time
- More than 60 minutes at a time
- As often as needed
- Don't know

How often would you be willing to access the proposed website-based treatment per week?

- Never
- Once a week
- Twice a week
- 3-4 times a week
- 5-6 times a week
- As often as needed
- Don't know

Using a website-based treatment, how concerned would you be about the following?:

	Not at all concerned	Slightly concerned	Somewhat concerned	Moderately concerned	Extremely concerned	Don't know
Security of my personal information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Confidentiality of my personal information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Established evidence that the treatment works	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

At there any other issues that you would be concerned about when using a website-based treatment? (optional)

How old are you? (optional)

How many weeks ago did you give birth? (optional)

How many children do you have? (optional)

Please indicate your ethnicity: (optional)

- White
- Mixed/Multiple ethnics groups
- Asian
- Black/African/Caribbean
- Chinese
- Arab
- Other ethnic group - please specify: _____
- Don't want to say

Where do you currently reside? (optional)

- England
- Wales
- Scotland
- Northern Ireland
- Ireland
- Other - please specify: _____
- Don't want to say

What is the highest level of education you have completed? (optional)

- None
- GCSE
- A level or equivalent
- Bachelor's Degree
- Master's Degree
- Doctorate
- Other - please specify _____
- Don't want to say

Please indicate your current occupation? (optional)

- Student
- Employee - full time
- Employee - part time
- Freelancer
- Self-employed
- Housekeeper
- Unemployed
- Retired
- Maternity leave
- Other - please specify _____
- Don't want to say

Please state your annual household income: (optional)

-
- £10,000-£19,999
- £20,000-£29,999
- 30,000-£39,999
- £40,000-£49,999
- 50,000-£59,999
- £60,000-£69,999
- 70,000-£79,999
- ≥£80,000
- Don't want to say

What is your current relationship status? (optional)

- Single
- In a relationship
- Married
- Separated
- Divorced
- Widowed
- Other - Please specify: _____
- Don't want to say

What is your current living arrangement? (optional)

- Living with my partner
- Living alone
- Living with my parents
- Government-assisted living for single parents
- Other - please specify _____
- Don't want to say

Do you have any comments or is there anything that you would like to tell us, which was not asked in the questionnaire? If yes, please use the text box provided below to do so (optional).

If you wish to receive a summary of the results of this study, please provide your email address here (optional):

When the website-based self-help treatment program for anxiety is available, would you be interest in helping us to test this program? If yes, please provide your email address here (optional). We would then contact you and send you information about this study with no obligation to take part.

Appendix 6.2 Ethical approval letter City, University London (Chapter 6)



School of Health Sciences

Ref: PhD/14-15/14

Research Office
Northampton Square
London EC1V 0HB

1 May 2015

Tel: +44 (0) 20 7040 5704

www.city.ac.uk

Dear Miriam / Susan / Ellinor

Re: Women's views on a website-based self-help program for postpartum anxiety

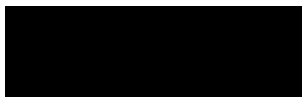
Thank you for forwarding amendments and clarifications regarding your project. These have now been reviewed **and approved** by the Chair of the School Research Ethics Committee.

Please find attached, details of the full indemnity cover for your study.

Under the School Research Governance guidelines you are requested to contact myself once the project has been completed, and may be asked to complete a brief progress report six months after registering the project with the School.

If you have any queries please do not hesitate to contact me as below.

Yours sincerely



Alison Welton
Research Governance Officer



**Appendix 7.1 Ethical approval NRES London-Dulwich Research Ethics Committee
(Chapter 7)**



Health Research Authority

London - Dulwich Research Ethics Committee

Health Research Authority
Skipton House
80 London Road
London
SE1 6LH

Telephone:
Fax:

14 December 2015

Mrs Miriam Ashford
School of Health Sciences
Northampton Square
London
EC1V 0HB

Dear Mrs Ashford

Study title:	Feasibility of a web-based intervention for postpartum women with anxiety: A randomised controlled trial
REC reference:	15/LO/1827
Protocol number:	N/A
IRAS project ID:	179292

Thank you for responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details. Publication will be no earlier than three months from the date of this opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to make a request to postpone publication, please contact the REC Manager, Mrs. Alison O'Kane, nrescommittee.london-dulwich@nhs.net.


Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation

Appendix 7.2 Two images of the iWaWa program (Chapter 7)

Welcome to the iWaWa Study [Home](#) [Participate now](#) [FAQ](#) [About Us](#) [Contact Us](#) [The iWaWa program](#)
Study Using an Online Self-Help Program for Worried/Anxious Mothers

What Am I Worried About!?



Welcome to the iWaWa program.

The program consists of **nine chapters** which you are asked to go through in the following 8 weeks.

Below you can see our **recommended order** of the chapters organised per week. You can **pick any order** for the Practice chapters, but it is important to **start with Chapter 1 "Is this for me?"** and **end with Chapter 9 "Understanding"** and go through all nine chapters by the end of the following 8 weeks.

You can go through a chapter in one go or you can come back and continue where you left off (make sure to use the same browser if you want to get back to where you left off). You can also access the chapter as often as you want to. If you have any questions or issues please contact Miriam T. Ashford (Miriam.Ashford@city.ac.uk).

To get started, click on the "Is this for me?" chapter below.

Week 1

[Chapter 1: Is this for me?](#)

Week 2 – Week 7: Practice chapters

[Chapter 2: When My Baby Cries](#)

[Chapter 3: Feeding My Baby](#)

[Chapter 4: Managing Inconsistent Information](#)

[Chapter 5: My Baby's Health And Safety](#)

[Chapter 6: Leaving My Baby To Be Cared For By Someone Else](#)

[Chapter 7: Comparing Myself With Others Or The Way I Used To Be](#)

[Chapter 8: Leaving the House To Go Out](#)

Week 8

[Chapter 9: Understanding](#)

Thank you very much for using the iWaWa program and participating in our study!

What Am I Worried About!?



What Is This Program About?

All mothers want to feel calm and confident. **Feeling worried is normal while adjusting to new life experiences such as caring for a baby.**

Do you sometimes **feel overwhelmed and agitated?** Are your **worries, doubts and fears interfering with your daily life** and **preventing you from experiencing times of enjoyment with your baby and your family?**

These feelings can be quite normal but, if you feel like this every day, most of the time, or if your worries are very intense, then anxiety could be reducing your quality of life as a mother.

There are things that everyone can do to help themselves feel better and enjoy this phase of life more.

This online self-help program is a first step towards easing distress and feeling more confident and calm.

This program is based on established theory. The practices are known to be effective in reducing anxiety. The ideas are designed to fit into the busy lives of mothers of young babies.

[Previous](#)

[Next](#)

0% 100%

Appendix 7.3 Interview schedule (Chapter 7)

Follow-up Interview Schedule

A. Overall experience

1. Why did you decided to take part in this study? Was there anything that appealed to you?
2. Were you able to start using iWaWa? Is there anything that could have made it easier for you to start iWaWa? - **for non-starters only**
3. Were you able to read through all chapters? If not, what made you stop? Is there anything that could have made it easier for you to continue using iWaWa?

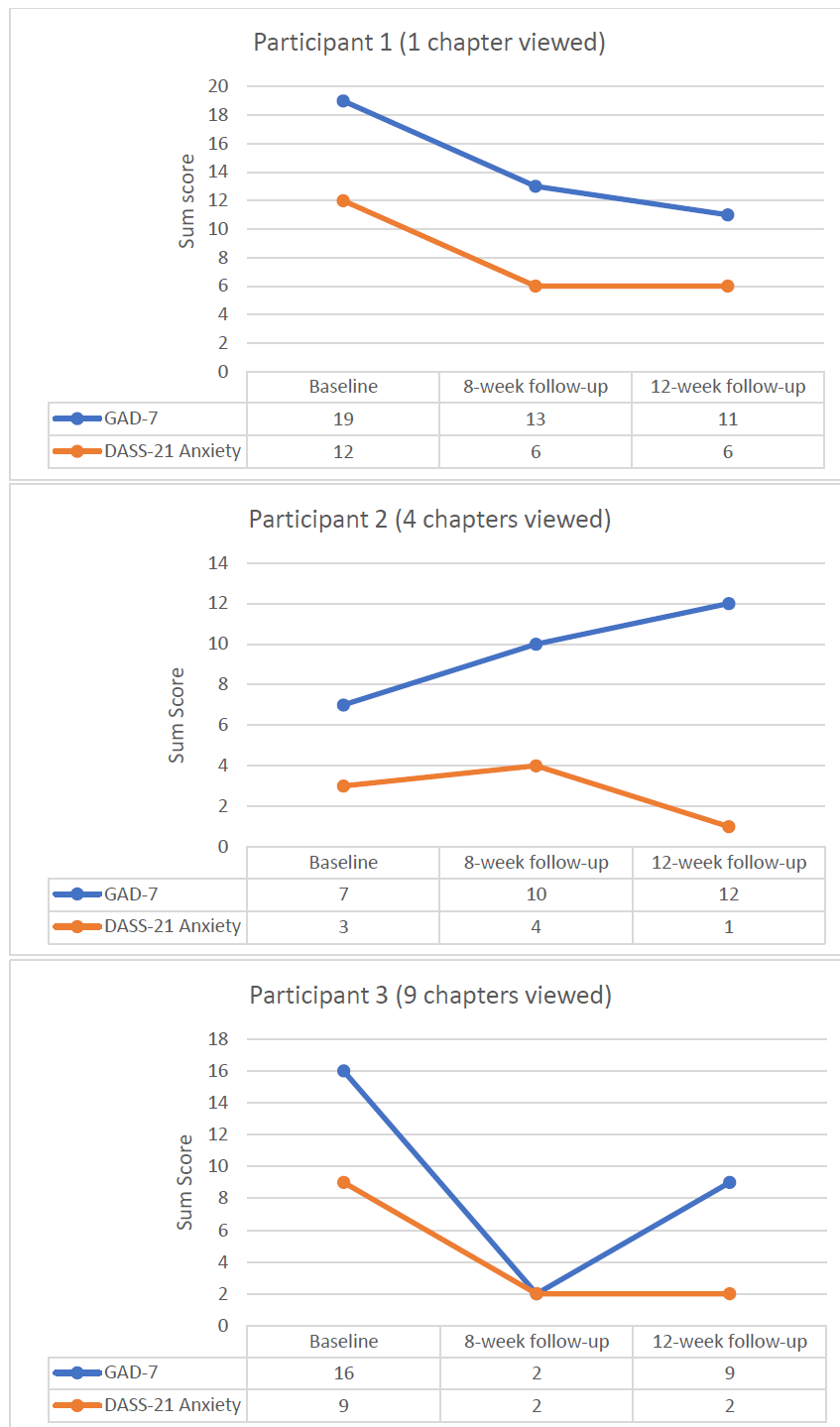
B. Acceptability & Usability

1. Were the iWaWa chapters/topics relevant to you? Were any topics missing?
2. What did you find most helpful with iWaWa?
3. What made it difficult for you to use iWaWa? How could we have made it easier?
4. How did you find iWaWa being delivered via the internet?
5. What do you think about the support available for iWaWa?
 - i. In terms of weekly email/SMS reminders
 - ii. In terms of iWaWa coach calls?

C. Other

1. Do you think iWaWa helped you with your anxiety? If yes, how? If no, why?
2. In your view, how could iWaWa be improved?
3. Do you have any other comments about what we have talked about today?

Appendix 7.4 Illustration of the anxiety scores of study completers and iWaWa starters for all assessments (Chapter 7)



Appendix 7.5 Description and rating of potential attrition factors (Chapter 7)

Factor	Relevance of Factor in the iWaWa Trial	Rating of the Potential Impact on Non-usage / Drop-out Attrition Rate
Quantity and appropriateness of information given before the trial, expectation management	Detailed information was provided on the study website and at the baseline assessment. However, it is unsure whether all participants read all the information.	Moderate to high
Ease of enrolment (e.g., with a simple mouse click as opposed to personal contact, physical examination etc.), recruiting the “right” users, degree of pre-enrolment screening	Enrolment was done only and the degree of pre-enrolment was low. Participants had to confirm that they fit the inclusion criteria and meet the anxiety screening cut-off point. All randomized participants met all inclusion criteria. As it was all self-report it cannot be excluded that some participants provided incorrect information.	Moderate to high
Ease of drop out / stop using it	It was easy to drop out/ stop using. Participants could stop the trial and iWaWa without mentioning any reasons.	High
Usability and interface issues	The findings revealed that iWaWa was rated and experienced as not user-friendly enough.	High
“Push” factors (reminders, research assistants chasing participants)	Participants received two reminders to start iWaWa and fill out the follow-up assessments. iWaWa users could sign up for weekly reminder emails or SMS.	Low
Personal contact (on enrolment, and continuous contact) via face-to-face or phone, as opposed to virtual contact	No personal contact was made. Virtual contact was only through emails from the study administrator (link to program and iWaWa and assessment reminders). Support phone calls were offered, but optional.	High
Positive feedback, buy-in and encouragement from change agents and (for consumer health informatics applications) from health professionals / care providers	iWaWa did not include positive feedback.	High
Tangible and intangible observable advantages in completing the trial or continuing to use it (external pressures such	No incentives were offered for participating in the trials. (Information about the monetary compensation for participating in the follow-up interview was included in	High

as financial disadvantages, clinical/medical/quality of life/pain)	the interview invitation after the 8-week treatment period).	
Intervention has been fully paid for (out-of-pocket expense)	iWaWa was accessible free-of-charge.	High
Workload and time required	iWaWa was experienced as too long and wordy. The follow-up assessments took between 5-10 minutes to complete.	Moderate to high
Competing interventions	We are currently not aware of another web-based intervention specifically targeting postpartum anxiety.	Low
External events (9/11 etc)	Grenfell tower fire in London	Low
Networking effects/peer pressure, peer-to-peer communication, and community building (open interactions between participants)	iWaWa did not offer a community for its users.	High
Experience of the user (or being able to obtain help)	Participants experienced it as difficult to access the iWaWa (logging-in and entering password and personal identifier). Participants could email researcher with technical issues (done by three people.)	High

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