Maternal engagement with music up to nine months post-birth: Findings from a cross-sectional study in England

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Abstract

There is significant evidence of the benefits of music for babies and emerging evidence that music may also benefit mothers' wellbeing. However, there is a lack of current large-scale data documenting maternal engagement with music in England. This cross-sectional survey study used descriptive and inferential statistics to examine how 473 mothers living in England engaged with music between 1-9 months post-birth, and regression models to examine demographic and musical predictors of this engagement. Findings indicate that the most frequently reported musical activities were daily listening to music (71%) and daily singing to babies (59%). Patterns of musical engagement differ by infant age, with mothers of 4-9 month old babies reporting more frequent singing and music class attendance compared with mothers of 1-3 month old babies. Mothers with previous or recent experience of music were more likely to engage in other musical activities, but musical engagement did not appear to be explained by socio-economic factors including years in education, marital status or household income. Findings could support practitioners in designing music activities for mothers, in particular highlighting the need for supporting mothers with very young infants, with little or no previous musical experience or with more than one child.

Keywords

Postnatal; cross-sectional, mothers, music engagement, survey

Introduction

This article explores maternal engagement with music among mothers between 1-9 months post-birth living in England, building on previous literature demonstrating that music can have a positive impact on infants and children as well as emerging evidence that music can support the wellbeing of mothers. The article seeks to explore what musical activities mothers engage with and when in current-day England, as well as predictors of this engagement. This enquiry aims to extend previous research that has documented aspects of parent and infant engagement in music, focusing not exclusively on music-making activities between caregiver and infant, but also the music-making activities of mothers themselves. Such information is designed to support those seeking to establish music classes or activities for mothers, but also to set the context for wider issues concerning maternal engagement in music and the potential implications of this in the postnatal period.

There is significant evidence of the benefits of music for babies both in the womb and after birth. Studies have demonstrated that babies can recognise sounds as early as 20 weeks into pregnancy (Shahidullah & Hepper, 1993) and remember them as much as one year after birth (Parncutt, 2009). Mothers who sing to their babies when pregnant have been found to have enhanced mother-infant bonding post-birth and their babies have been found to have increased feeding ability (Standley, 1991, 2003; Whipple, 2000). There is also indication that regularly listening to music from 20 weeks of pregnancy may improve certain aspects of new-born behaviour (Arya, Chansoria, Konanki, & Tiwari, 2012). In addition, playing or singing to premature babies has been shown to stabilise physiological measures, increase oxygen saturation, increase weight and shorten hospital stay (Caine, 1991; Cassidy & Standley, 1995;

Chapman, 1975; Lorch, Lorch, Diefendorf, & Earl, 1994; Standley & Moore, 1995), and maternal singing has also been shown to modulate the arousal of healthy infants (Shenfield, Trehub, & Nakata, 2003). Into childhood, music has been linked with improved development including language acquisition (Hallam, 2010), and active musical participation in infants has been demonstrated to enhance culture-specific musical acquisition as well as social and communication development (Gerry, Unrau, & Trainor, 2012).

Alongside literature on the benefits of music for infants and children, there is also some preliminary evidence that music can support mothers. Music therapy, for example, has been found to reduce anxiety, stress and depression in pregnant women (Chang, Chen, & Huang, 2008) and can also empower parents with premature infants, increasing their wellbeing, self-confidence and interactions with their babies (Haslbeck, 2014). Outside of therapeutic contexts, Mualem & Klein (2013) compared mother-baby musical interaction with mother-baby play interaction in the home, demonstrating that positive emotions, duration of physical contact and eye contact and the length of communication chains were significantly higher in music than in play. Further, Nakata & Trehub (2004) suggest that music's regular pulse could enhance mother-baby emotional coordination and, based on an autoethnography, Mackinlay (2009) argues that songs in the family home enabled, among other benefits, behavioural management, stress relief and emotional expression. More recently, a cross-sectional survey with 391 mothers 1-9 months postpartum in the UK revealed associations between singing daily to babies and decreased symptoms of postnatal depression (PND) as well as enhanced wellbeing, self-esteem and self-reported mother-infant bond (reference removed for review). To explore the direction of this association, an RCT study comparing 10-week programmes of group singing, creative play and usual care for mothers with symptoms of PND revealed that singing

can reduce PND symptoms more rapidly than usual care or creative play among mothers with moderate-severe symptoms (reference under review).

Given these recorded benefits for infants, children and – to some extent – mothers, it is not surprising that there is now a plethora of musical activities available for parents and their babies in England. These include activities such as free or low-cost group music sessions, typically based on nursery rhymes and children's songs, held in public spaces such as libraries and community or church playgroups. Additionally a wide range of companies, such as *Monkey Music* (www.monkeymusic.co.uk) and *Jo Jingles* (www.jojingles.com), offer paid music classes involving activities including singing, movement and use of percussion instruments, and music groups are increasingly established by entrepreneurial musicians working in their local communities. Furthermore, concerts specifically for parents and their babies or young children are expanding, with companies such as *Bach to Baby* (www.bachtobaby.com) providing classical concerts in and around London. This community-based provision is also underpinned by the immediate availability of music for many parents, supported through technology such as television, smart phones and internet streaming of music and film (see also Young, 2008). Yet, there is little research that scrutinises what music mothers themselves actually choose to engage with in the months immediately following childbirth. Given that musical activities available to mothers are now so prevalent, it is timely to consider *what* and *how much* music mothers engage with, *when* they engage with it and – crucially – *who* exactly engages with it. Such information could support the development of more targeted music programmes not just aimed at supporting infants but also at supporting mothers.

Some previous research related to this topic has been carried out. Regarding how much music mothers engage with, a sizeable body of research has explored the prevalence of musical engagement in families with young children. Based on a sample of over 2000 families in the US, Custodero, Rebello Britto, & Brooks-Gunn (2003) demonstrated that 60% of parents surveyed reporting playing music or singing for their children every day, with an additional 32% reporting these activities weekly. Ilari (2005) interviewed 100 mothers of infants aged 7-9 months in Canada, reporting that mothers engage musically with their babies predominantly through singing, and Young (2008), based on interviews with 88 mothers in England, found that 88% of mothers of children aged up to two years reported that they sang and played musical games. Nonetheless, de Vries (2009) found that only 9% of a sample of 63 Australian parents sang to their pre-school children daily, and only 14% encouraged musical play with their children. Further, Street, Young, Tafuri, & Ilari (2003) found that, while no mothers in her study reported never singing to their babies, mothers can feel insecure about singing.

Two themes emerge from these previous studies. First, attention is mainly focused on singing and musical play. There is very little consideration of other musical engagement, despite the fact that the services now available for mothers can vary widely, from concerts to classes to musical engagement via technology. Second, there is great variation in the reported levels of engagement, and in particular there is not current data available for England. Consequently, it is timely to understand from a broader perspective what music mothers with young infants in England engage with, and the extent to which they do so. In particular, it is important to understand both activities specifically conducted with babies (e.g. singing to babies or attending music classes) as well as activities more for the mother (e.g. playing an instrument or attending concerts).

There is also evidence to suggest that musical engagement for mothers may vary in different stages of motherhood. Trehub & Gudmundsdottir (2015), for example, argue that mothers sing to babies first to sooth or amuse them, but as they get older to encourage collaborative and independent singing. Further, Custodero & Johnson-Green (2008) demonstrated that music acts as a means of *provisioning* the environment in the early months, to provide routines and structure for the infant. Later, music becomes more focused on *engaging* with the environment, as responses to music become based on shared intention between caregiver and infant. Nonetheless, there is little evidence of how maternal music engagement more generally, including activities such as playing music or attending concerts – which may or may not be engaged in with infants – varies for mothers at different postnatal time points. Specifically, we also know little of how or whether maternal musical engagement changes in the immediate months postpartum.

Finally, it is pertinent to consider the factors that might affect maternal musical engagement. De Vries (2009) revealed that parents felt a lack of time for regular music engagement with their children, a belief that musical experiences are adequately provided in educational contexts, a lack of parental musical knowledge, reliance on products such as CDs and DVDs for home musical experiences and a focus on the non-musical benefits of music engagement (p. 395). Indeed, Trehub and Gudmundsdottir (2015) point out that factors associated with reduced talking to infants, such as poverty, depression, and low educational attainment, are also associated with diminished singing to infants. Further, Ilari (2005) showed that professional mothers sang more often to their babies than mothers who were housewives or students, and that mothers with previous experience of instrumental music making reported listening to music

with their baby more frequently that those without. Reinforcing the suggestion that maternal music engagement is not consistent, Custodero et al. (2003) demonstrated that parents with more than a high school education were more likely to sing or play music to their children. Given that we know that arts engagement in the UK is influenced by socio-economic factors such as income (Department for Culture, Media and Sport, 2016), and that this may also be the case for maternal music engagement, it is prescient to explore which mothers engage in music, as well as the overall picture of what and when they do so.

This article therefore builds on the previous literature to explore maternal engagement in music activities in England. In particular, we lack a current picture of maternal engagement with music in the months immediately following childbirth, both in and out of the home, and there are no present-day large-scale survey studies that focus on England. Consequently, and based on the above review of existing literature, this study aimed to explore three related research questions (RQ): *Types of musical engagement*, RQ1: what music mothers living in England engage with in the first 1-9 months post-birth and to what extent; *Frequency of musical engagement*, RQ2: whether musical engagement is different for mothers at different points in the postnatal period; and *Factors predicting musical engagement*, RQ3: what factors are predictive of mothers living in England engaging with music in the first 1-9 months post-birth. The purpose of the study is not to paint a picture of *infant* musical engagement (for this, see Custodero et al., 2003; Young, 2008), but rather to examine *maternal* engagement, in order to inform understanding of interest and participation in music amongst this particular population. This is of importance given that we know that music can influence infant behaviour and mothers' wellbeing, therefore carrying implications for supporting mothers in and through music.

Methods

Participants

The study draws on data from a larger sample of 2,306 adult women living in England in the last trimester of pregnancy (28 weeks or more) and the first nine months post birth (up to 40 weeks). Participants were recruited from hospitals, General Practices (GPs), mother and baby charities and through social media (including Twitter and mums' groups on Facebook) in England. The study received ethical approval from the NHS Research Ethics Service (15/SS/0160) and all participants gave informed consent prior to involvement in the study. Women who participated were entered into a prize draw to win Mothercare (a British retailer specialising in children's equipment, clothing and toys) vouchers.

For this study, we focused on cross-sectional data from women in the sample who were post-partum: a total sample of 755 women. However, we restricted our sample to women who were four weeks or more post-birth, recognising that the first four weeks postpartum may not be fully representative of maternal musical behaviours. The final sample constituted 473 women (see Table 1).

Measures

Data analysed in this study consisted of two categories: demographic and musical.

Demographic questions assessed: age (calculated from date of birth); number of weeks post-birth; household income (<£16,000, £16,000-£30,000, £31,000-£60,000, £61,000-£90,000,

>£90,000); education (vocational, GCSE, A-levels, undergraduate degree, postgraduate degree); and marital status (married vs not married).

Musical questions assessed: frequency of attending concerts in the past 3 months; frequency of making music in the past 3 months; frequency of listening to music (referring not specifically to listening with baby but listening in general: rarely, a couple of times a week, every day <1hr, every day 1-2hrs, every day 3-5hrs, every day 5+hrs); frequency of singing to baby (not at all, occasionally, often, daily); engagement in infant music classes with baby (not at all, yes); genre of music listened to and sung; and number of years of past musical experience playing an instrument.

Statistics

Data were analysed using SPSS version 23.0 (IBM, Chicago). To ascertain the demographics of the sample, the women were split into tertiles post-birth: up to 3 months (T1, n=147), 4-6 months (T2, n=171) and 7-9 months (T3, n=155). Differences between the three groups in demographic factors were compared using one-way analyses of variance for parametric linear variables (age of mother), Kruskal-Wallis Test for nonparametric linear variables and ordinal variables (number of previous children and household income) and Pearson's Chi-squared test for nominal variables (education, marital status).

To explore types of musical engagement (RQ1), we analysed descriptive statistics and created bar charts. To explore frequency of musical engagement (RQ2), we used Kruskal-Wallis Test for ordinal variables (frequency of listening to music, frequency of singing to the baby) and Pearson's Chi-squared test for nominal variables (whether they had attended a concert, made

music themselves or attended a baby music class). Overall, for significant results from the Kruskal-Wallis tests, post-hoc Mann-Whitney U Tests were carried out assuming a Bonferroni-corrected $\alpha=0.05/3=.017$, and for significant results from Pearson's Chi-squared tests, post-hoc tests were carried out by examining standardised residuals. To explore predictors of musical engagement (RQ3), we used binary logistic regression models based on three models: model 1 looked at the impact of demographic variables (including age, previous children, education, marital status and household income); model 2 additionally explored the impact of previous musical experience; and model 3 additionally explored other current musical engagement in order to isolate the effects of the specific activity in question. Within these regression models, linearity of the continuous variables with respect to the logit of the dependent variable was confirmed via Box-Tidwell (1962) procedure and goodness of fit was checked with the Hosmer and Lemeshow test. For regressions, educational attainment was recoded to account for the average number of years spent in education: GCSE (11 years), A-levels (13 years), undergraduate degree (16.5 years), postgraduate degree (20 years). For this recoding, 'vocational' was removed from the analysis. Similarly, for regressions, 'daily' music listening was classified as listening for more than 1 hour per day in order to remove potential accidental music listening such as in shops. P values of less than .05 were considered significant.

Results

Descriptive statistics

Data from 473 women were analysed (see Table 1). Groups were well matched on all factors except marital status, where post-hoc tests using standardised residuals revealed that there

was a higher percentage of women in the 1-3 month group (T1) who were married compared to T2 and T3.

[INSERT TABLE 1 AROUND HERE]

RQ1: Types of musical engagement

To explore musical engagement, we analysed the frequency of attending concerts, making music, listening to music, singing to baby and attending baby music classes. Only 15% of mothers had attended a concert in the previous 3 months, with only 3% of mothers having attended more than one concert. Similarly, only 18% of mothers had made music in the past 3 months, such as singing in a choir or playing an instrument, and only 12% had made music more than once in the past 3 months. However, 93% of mothers reported listening to music at least twice a week and 71% of mothers reported listening to music on a daily basis. Similarly, 87% of mothers reported singing to their babies on a regular basis, with 59% singing to them daily. In terms of going to baby music classes, 34% of mothers reported attending, but only 22% reported attending on a weekly basis.

When asked what music they listened to on a regular basis, mothers were most likely to listen to pop music (76%) and least likely to listen to jazz (15%) (see Figure 1). In singing to their babies, they were most likely to sing nursery rhymes (83%) although 64% of mothers also reported singing songs of their own composition (see Figure 2). Less than 11% of mothers reported singing specific songs from the classical music repertoire. When asked whether the choice of songs was primarily for their own enjoyment versus for their baby's enjoyment, less than 9% reported singing songs that were more for their own enjoyment, while 54% reported singing songs that were more specifically tailored to their babies. The remaining 37% reported choosing

their repertoire equally for their own and their baby's enjoyment. When asked how many songs they knew that were suitable for singing to their babies, 6% of mothers reported knowing 'hardly any', 35% reported knowing 'a few', 28% reported knowing 'quite a lot' and 31% reported knowing 'plenty'.

[INSERT FIGURES 1 AND 2 AROUND HERE]

RQ2: Frequency of musical engagement

We compared across tertiles the average amount mothers engaged in musical activities (see Table 2). Due to the infrequency of attending concerts and making music, we categorised attendance as a binary variable (no attendance vs attended at least once). There was evidence of a slight trend towards increased attendance at concerts and increased frequency of making music, with more mothers with older babies engaging. However, this was not statistically significant. Similarly, there was no difference in the frequency of listening to music across the three tertiles. However, for frequency of singing to babies and engagement in baby classes, there was a visible increase across the 3 tertiles, and post-hoc tests revealed that mothers sang less often and attended fewer classes when their babies were 1-3 months (T1) than when they were older (T2 or T3).

[INSERT TABLE 2 AROUND HERE]

RQ3: Factors affecting musical engagement

Binomial logistic regressions were performed to ascertain whether demographic factors could predict the likelihood that a mother would engage with music in the five ways being examined (see Table 3).

The overall model for attendance at concerts in the past 3 months was statistically significant, $\chi 2(10)=30.763$, $p=.001$, and explained 14.0% (Nagelkerke R^2) of the variance in concert attendance. Attendance at concerts was not predicted by demographic factors or past experience of playing a musical instrument, but making music in the past month was associated with a 5.4 fold increase in the likelihood of attending a concert, suggesting many of the same people engaged in both activities.

The overall model for making music in the past month was also statistically significant, $\chi 2(10)=.286$, $p<.001$, and explained 33.3% (Nagelkerke R^2) of the variance in making music. Older mothers and those with previous musical experience were more likely to have made music in the past month. In addition to the relationship with attending concerts, women who had attended baby music classes were 3.3 times more likely to have made music themselves in the past month.

The model for listening to music on a daily basis was statistically significant, $\chi 2(10)=24.142$, $p=.007$ and explained 8.9% (Nagelkerke R^2) of the variance in listening habits. Women with past musical experience were more likely to listen to music on a daily basis. In addition, those who sang to their babies on a daily basis were nearly 1.4 times more likely to listen to music on a daily basis.

The overall model for singing to baby on a daily basis was statistically significant, $\chi 2(10)=40.603$, $p<.001$, and explained 13.6% (Nagelkerke R^2) of the variance in singing habits. Women with previous children were nearly half as likely to sing to their new baby on a daily basis. In addition to the relationship between daily listening and singing, women who took their babies to music classes were nearly 1.7 times more likely to sing to them on a daily basis.

Finally, the overall model for attending baby music classes was statistically significant, $\chi 2(10)=44.829$, $p<.001$, and explained 15.4% (Nagelkerke R^2) of the variance in attendance. Similarly to singing, women with previous children were half as likely to take their new baby to music classes, and there was a trend, although not significant, towards women with higher educational attainment attending more baby music classes. In addition, making music and daily singing to baby were associated with an increased likelihood of mothers attending baby music classes.

[INSERT TABLE 3 AROUND HERE]

Discussion

This study has investigated the musical engagement of mothers between 1-9 months post-birth. Three main areas have been scrutinised, and findings from each will be discussed in relation to extant literature and in terms of implications for research and practice.

First, in terms of what music mothers engage with, and to what extent, this study lends support to Custodero et al. (2003) and Ilari (2005), with the most frequently reported musical activities being daily listening to music (predominantly pop music), and daily singing to babies. Many fewer women, though, engage in activities that involve attending musical events such as concerts, baby music classes or playing instruments. This may be, in part, due to the accessibility of listening to music and singing, both of which can be conducted from within the home (Young, 2008) and are therefore more readily available to mothers who may find it challenging to leave the house with a young infant. If this is the case, further opportunities for mothers to attend concerts with their babies might well be justified, allowing them to combine musical engagement with caregiving.

Regarding listening behaviours, the findings demonstrate that the mothers listen most to pop and rock music, suggesting that their choice of repertoire may well be driven by their own musical preferences rather than with their infant specifically in mind (see also Young, Street, & Davies, 2007). Indeed, we know that listening to music can regulate aspects of mood and enhance wellbeing (Laukka, 2007; Thoma, Ryf, Mohiyeddini, Ehlert, & Nater, 2012), and it may be that mothers listen to music as a form of 'company' when home alone with infants and/or to increase enjoyment of day-to-day routines. Regarding singing to babies, while nursery rhymes were most frequently sung, over half of the mothers also sang songs of their own composition. One interpretation of this finding is that many women are highly creative in their musical interactions with their infants, using singing creatively as part of their everyday or routine experiences (Addessi, 2009; Barrett, 2009). Indeed, Trehub (2002) has previously demonstrated that mothers spontaneously and selflessly 'mentor' their infants musically, and additional research has indicated that maternal singing may act as a form of arousal modulation in response to an infant's emotional state, making it a potentially valuable mothering tool (Shenfield, Trehub, & Nakata, 2003). In light of research indicating associations between daily singing to babies and enhanced maternal wellbeing (reference removed for review), further research is required in order to examine the direction of causality and to consider whether singing to babies should be recommended as a wellbeing-strategy in the postnatal period, as well as supporting the musical worlds of young children.

Second, we investigated whether musical engagement is different for mothers at different points in the postnatal period. The results indicate that some patterns of musical engagement are different among mothers with very young infants and those with older infants, but that this was specific to the activities conducted *with* infants rather than other forms of musical engagement such as music making or concert attendance. In this regard, mothers with infants aged 1-3

months (T1) appear to sing less often and attend fewer music classes than mothers with babies aged 4-9 months (T2/T3). This may be reflective of the fact that there are multiple demands on the time of mothers, and that many will initially find little time for activities beyond basic care of their infant. As the infant grows older, however, and mothers become more accustomed to their new role, it may be that they begin to sing more with their infants and feel able to take them to music classes out of the home. This is of relevance to those organising maternal music activities, both in terms of the ideal time to engage with mothers but also in terms of designing new means for mothers with very young babies to remain engaged in music.

Third, we explored factors that may predict maternal engagement in music. Ilari (2005) suggested that there may be some indirect effects of musical training on the way in which women engage musically with their children. In the current study, previous musical experience predicted singing daily to infants, but also listening to music and recent music making. This implies that previous experience with music not only interrelates with the ways in which mothers use music with their infants, but also their wider musical engagement and practices. Furthermore, the findings suggest that many musical activities are predictive of one another, with women who engage in one musical activity more likely to also engage in another musical activity (in what is probably a series of bi-directional relationships). Therefore, it may well be that while some mothers have access to these musical resources, others are missing out. Given that we know that musical listening and playing can enhance aspects of wellbeing (MacDonald, Kreutz, & Mitchell, 2012), more targeted recruitment of mothers with little or no previous musical experience, and who do not typically engage with music, may be fruitful in generating new audiences for maternal music making and in supporting maternal wellbeing.

Another finding, in line with Custodero, Rebello Britto, & Brooks-Gunn (2003), is that women with previous children were nearly half as likely to sing to their new baby on a daily basis, and half as likely to take their new baby to music classes. It may be the case that the logistical or financial constraints of multiple children make attending classes more difficult, and/or that mothers find less time to sing to subsequent babies with the demands of also looking after one or more older children. This has implications in terms of musical provision for multipara mothers, who may benefit from opportunities to engage musically that are specific to their circumstances and based on bespoke resources. Providers may consider, for example, music classes that are designed for a combination of older and younger infants and that take an interactive approach to mothers' musical preferences, and music educators may support in-home singing to infants via technology that enables children of different ages to engage. Finally, it is notable that years of education, marital status and household income do not explain variance in maternal musical engagement in this study, suggesting that day-to-day music engagement among mothers may not be mediated by these socio-economic factors. This is in contrast to wider surveys of arts and culture participation, which suggest that those in the 'upper socio-economic group' are significantly more likely to participate in the arts (Department for Culture, Media and Sport, 2016). This may suggest that mothers in the months following childbirth do not follow typical patterns of arts engagement, although further research is needed to ascertain this with any certainty.

While illuminating the current state of maternal engagement with music in England this study is limited by its cross-sectional nature which precludes causal relationships. The participants also were not randomly recruited so they cannot be assumed to be completely nationally representative. Nevertheless, our demographic data suggested that they did come from broad cultural and socio-economic backgrounds as well as from across the country, meaning that the

data do have a relevance across England. Additionally, the study focused only on mothers and did not include fathers, requiring future work to examine the musical engagement of family units in the postnatal period. Further qualitative work to more fully understand maternal music engagement, and how this differs in terms of mother-focused and infant-focused activities, will also be of importance. Nonetheless, these findings will be of relevance to music educators seeking to work with mothers and their young babies. In particular, knowledge of mothers' existing musical practices – including an emphasis on listening to pop music and singing nursery rhymes and own compositions – could shape the content of music classes aimed at supporting musical engagement for mothers as well as babies. Importantly, the creativity of mothers in engaging musically with their babies should also be incorporated into provision for this group, supporting those who already create their own music but also encouraging those who may not. Further, given that the same women seem to be engaging in multiple musical activities, educators will benefit from situating music engagement within mothers' existing musical lives in order to support them in building a musical portfolio for themselves and their babies. Finally, further work is needed in order to introduce music into the lives of mothers from across socio-economic backgrounds who have not previously engaged with or made music.

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TABLE 1

Table 1. Demographic characteristics of participants by tertile.

	T1[a] n=147	T2 n=171	T3 n=155	Test statistic	p
Age, μ ± SD	31.0 ± 5.1	32.0 ± 4.7	32.1 ± 5.1	$F_{2,472}$=2.205	.111
Previous children, %				$X^2(2)$=0.425[b]	.808
None	55.8	54.4	58.1		
1	33.3	34.5	31.6		
2	6.8	8.8	8.4		
3	4.1	2.7	1.9		
Education, %				$X^2(8)$=15.118	.057
Vocational	4.8	4.1	3.2		
GCSE	14.3	12.9	3.9		
A-levels	21.1	18.1	19.4		
Undergraduate degree	30.6	40.4	44.5		
Postgraduate degree	29.9	24.6	29.0		
Marital status, %				$X^2(2)$=13.198	**.001**
Married	42.2	26.3	24.7		
Household income, %				$X^2(2)$=5.648[b]	.059
<£16,000	10.9	4.7	2.6		
£16,000-£30,000	19.7	15.8	16.1		
£31,000-£60,000	45.6	53.8	52.3		
£61,000-£90,000	15.6	18.1	17.4		
>£90,000	8.2	7.6	11.6		

[a]T1: 1-3 months post-birth; T2: 4-6 months post-birth; T3: 7-9 months post-birth

[b]Kruskal Wallis Test

TABLE 2

Table 2. Percentage engagement and differences in musical engagement in the past 3 months by tertile.

	T1	T2	T3	$X^2(2)$	P
Attendance at concerts in the past 3 months, %				0.258	.879
Yes	13.8	15.6	15.9		
Freq of making music in the past 3 months, %				1.585	.453
Yes	14.2	19.3	19.6		
Freq of listening to music, %				1.149[a]	.563
Rarely	8.5	7.4	5.8		
A couple of times a week	18.5	25.7	20.9		
Every day, <1 hr	41.5	35.1	36.7		
Every day, 1-2 hrs	18.5	20.3	25.2		
Every day, 3-5 hrs	10.0	7.4	9.4		
Every day, 5+ hrs	3.1	4.1	2.2		
Freq of singing to the baby, %				23.474[a]	**<.001**
Not at all	3.8	0.01	0		
Occasionally	22.1	8.1	6.5		
Often	28.2	31.8	23.0		
Routinely/daily	45.8	59.5	70.5		
Attendance at baby music classes, %				33.365	**<.001**
Never	84.7	61.6	52.2		
Sometimes	15.3	38.4	47.8		

[a]Kruskal Wallis Test

TABLE 3

Table 3. Demographic and musical predictors of musical engagement.

	Attendance at concerts			**Making music**			**Listening to music daily**			**Singing daily to baby**			**Music classes**		
	B	SE	OR	B	SE	OR	B	SE	OR	B	SE	OR	B	SE	OR
MODEL 1															
Age (yrs)	0.03	0.04	1.03	**0.07**	**0.03**	**1.07***	0.03	0.03	1.03	0.03	0.03	1.03	0.04	0.03	1.04
Previous children (Y/N)	-0.10	0.32	0.91	-0.42	0.31	0.66	0.09	0.25	1.10	**-0.68**	**0.23**	**0.51****	**-0.70**	**0.25**	**0.50****
Education (yrs)	0.04	0.04	1.04	0.04	0.04	1.04	-.03	0.03	0.97	-0.01	0.03	1.00	0.06	0.03	1.06 †
Married (Y/N)	-0.37	0.34	0.69	-0.41	0.32	0.66	-0.20	0.27	0.82	0.39	0.25	1.48	0.14	0.27	1.15
Household income	0.14	0.18	1.15	0.24	0.16	1.28	0.02	0.14	1.02	0.20	-.13	1.23	0.18	0.13	1.20
MODEL 2															
Previous musical experience (years)	0.03	0.02	1.03	**0.13**	**0.02**	**1.13*****	**0.10**	**0.03**	**1.11****	**0.09**	**0.02**	**1.09****	0.03	0.02	1.03
MODEL 3															
Attendance at concerts (Y/N)	-	-	**-**	**1.67**	**0.37**	**5.32*****	0.67	0.41	1.97 †	-0.26	0.34	0.77	0.21	0.34	1.23
Making music (Y/N)	1.68	0.37	**5.37*****	-	-	-	0.06	0.39	1.06	0.40	0.36	1.49	**1.15**	**0.33**	**3.15*****
Daily listening (Y/N)	0.68	0.41	1.98 †	0.18	0.41	1.19	-	-	-	0.31	0.25	1.36	-0.03	0.27	0.97
Daily singing to baby (Y/N)	-0.20	0.34	0.82	0.35	0.37	1.42	**0.33**	**0.25**	**1.39**	-	-	-	**0.51**	**0.25**	**1.66***
Attendance at baby music classes (Y/N)	0.22	0.34	1.25	**1.21**	**0.33**	**3.34*****	-0.07	0.27	0.93	**0.50**	**0.25**	**1.65***	-	-	-

†p<.1; *p<.05; **p<.01; ***p<.001

Figure 1. Types of music listened to by mothers 1-9 months post-birth.

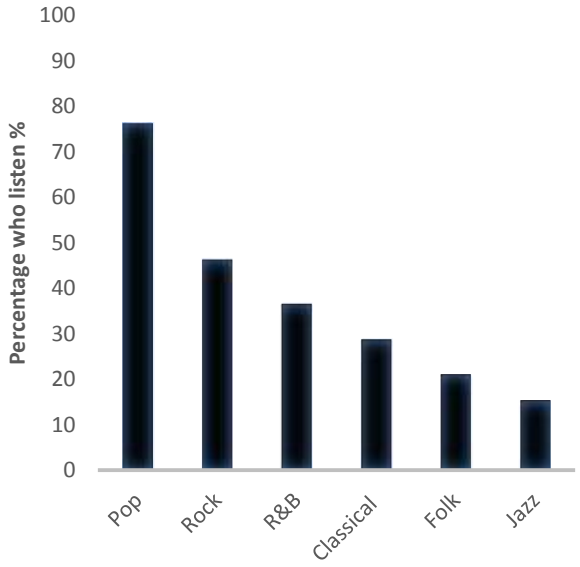

Figure 2. Types of music sung by mothers 1-9 months post-birth.