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Predecessors of Behavioural Initiatives by People With Profound Intellectual Disabilities During Their Interactions With Support Staff: An Exploratory Microanalytical Analysis

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ABSTRACT

Background: Initiating meaningful moments of interaction with people with profound intellectual disabilities can prove to be difficult for support staff. Exploring the behaviour of support staff that precedes the initiations of behaviour by people with profound intellectual disabilities helps to shed light upon the potential facilitating effects of staff behaviour.

Methods: Three meaningful moments of interaction between support staff and people with profound intellectual disabilities that were recorded were then microanalytically coded, along with the initial onset of these moments. Each behaviour initiated by people with profound intellectual disabilities was examined to see what specific behaviour by the support staff began precedingly.

Findings: The most frequently displayed 'staff–client' behavioural sequences were 'looking', 'moving with head', 'moving with arms' or 'vocalisation' of support staff followed by the person with profound intellectual disabilities 'moving with head', the staff member 'moving with arms' followed by the person with profound intellectual disabilities 'moving with arms' and the staff member 'touching' followed by the person with profound intellectual disabilities 'vocalising'. These behavioural sequences occurred less frequently during meaningful moments of interaction in comparison to their onset.

Conclusions: It is important that support staff are cognisant of all the (subtle) behavioural changes in people with profound intellectual disabilities (especially movements with their head) to discern potential behavioural responses. Moreover, they should be cognisant of their own behaviour, insofar as the conscious use of behaviour may facilitate the development of meaningful interactions.

1 | Background

Meaningful relationships between individuals are predicated on meaningful moments of interaction between them (Stern 2004). For instance, based on the interactions between parents and infants, it is well-established that spending time together and finding out what is effective in the interaction with the other person can lead to the development of such meaningful moments (Feldman 2007). In line with this, the occurrence of meaningful moments has also been described by support staff working with

Summary

- Three meaningful moments of interaction between people with profound intellectual disabilities and support staff were coded in the greatest detail. Frequently occurring behavioural sequences were detected.
- Support staff need to be aware of all (subtle) behavioural changes of people with profound intellectual disabilities. Support staff need to be specifically aware of people with profound intellectual disabilities moving with their heads. This awareness of staff will decrease the chance of missing any of the potential behavioural initiatives of people with profound intellectual disabilities.
- Support staff should use looking, movements of their head and arms, vocalisations and touch consciously. Thereby, meaningful interactions might more easily develop.

people with profound intellectual disabilities[1] (Penninga et al. 2022). However, staff members have also emphasised the challenges they face with respect to learning to recognise the signals of people with profound intellectual disabilities to discern their meaning and find an appropriate way to respond (Nieuwenhuijse et al. 2020). This derives from the fact that every person with a profound intellectual disability has their own individual way of displaying their needs via (predominantly) behavioural, non-conventional signals that are mainly non- and pre-intentional (Dhondt et al. 2020). Therefore, it is vital that support staff both learn to recognise these signals and find out via trial and error what works and what does not in their interactions with specific individuals with profound intellectual disabilities (Hoogsteyns et al. 2023). Unravelling and visualising sequences in the behaviour of support staff and people with profound intellectual disabilities in their interactions can help support staff comprehend the potential effects of their actions upon (the behaviour of) people with profound intellectual disabilities, and thereby facilitate the development of meaningful moments of interaction between them.

As demonstrated in parent–infant research, the behavioural sequences underpinning an interaction can be unravelled by microanalytically investigating the relation in time between the behaviour of parents and infants (e.g., Beebe et al. 2010). The behaviour of parents following upon the behaviour of infants was investigated (e.g., Moore, Cohn, and Campbell 1997), as well as the behaviour of parents that precedes the behaviour of infants (e.g., Pemberton, Borrego, and Sherman 2013). These explorations provided insight into the (potential) effect that the behaviour of parents has upon the behaviour of infants (e.g., Beebe and Gerstman 1980; Cohn and Tronick 1987). More specifically, these explorations provided information pertaining to which specific behaviours of parents can be stimulating or encouraging for infants, and which behaviours discourage them and decrease their engagement (e.g., Beebe and Gerstman 1980; Forbes et al. 2004).

In accordance with this, staff members working with people with profound intellectual disabilities tend to use their own behaviour as a means to evoke a response from the person with profound intellectual disabilities. For example, the staff member in Hostyn and Maes' (2013) case study did, amongst other things, intentionally utilise imitation and various modes of behaviour for this precise purpose, whilst support staff were also found to often use multiple forms of incentives, such as vocalisations, to either get or retain the attention of people with profound intellectual disabilities (Neerinckx et al. 2014). However, the question of how precisely the behaviour of support staff impacts the behaviour of people with profound intellectual disabilities has not yet been studied on a microanalytic level.

For the sake of daily practice, it would be useful to find out more about the behaviour of support staff that precedes the behavioural initiatives of people with profound intellectual disabilities during their interactions. Exploring specific behaviour during moments of interaction that are deemed to be meaningful by support staff as well as the initial onset of these moments may add to extant knowledge about the development of these meaningful moments. Therefore, in this study, the following research question will be answered: 'What specific behaviours by support staff precede the initiation of behaviour by people with profound intellectual disabilities during (the onset of) meaningful moments of interaction?'

2 | Method

2.1 | Design and Procedure

The present study aimed to explore the specific behaviours of support staff that preceded the initiation of behaviour by people with profound intellectual disabilities during (the onset of) meaningful moments of interaction. Thereby, this study presents additional analyses of the data that were previously analysed to explore what behaviour characterised meaningful moments of interaction between support staff and people with profound intellectual disabilities (Penninga et al. 2024). After approval of the Ethical Review Board of Tilburg University (RP-407), staff members from two service providers were recruited by purposive sampling (for detailed information on recruitment and data collection, see Penninga et al. 2024). Each staff member decided which person with profound intellectual disabilities they would like to form a (research) duo with, and then their parents were asked to provide their consent. The staff member and the person with profound intellectual disabilities were then filmed for 30 min in a daily situation in which the staff member expected meaningful moments of interaction to occur. To assess both whether and when exactly these meaningful moments of interaction occurred, the researcher (W.P.) reviewed the recorded video with the staff member. The review was carried out in accordance with the Burford Review Protocol (Burford 1993), which means that the entire video was played non-stop at normal speed with the staff member asked to indicate moments of interaction that they deemed to be meaningful by saying 'yes'. To stay as close as possible to the (subjective) experience of meaningfulness of the participating members of support staff (Penninga et al. 2022), no definition of meaningful moments was given. They were just told that these moments could be described as so-called 'yes-moments'. After the video finished, the researcher then returned to each of the indicated meaningful moments. The staff member was then asked to indicate when the meaningful moment stopped and elucidate what made this moment meaningful for them. The

staff member was then asked to rate each moment of interaction on its 'meaningfulness' on a scale from 1 to 10—'1' indicating 'a little meaningful' and '10' 'very meaningful'.

Each review resulted in a number of moments of interaction that the staff member deemed to be meaningful. For each dyad, the fragment that was rated as being the most meaningful was then coded using the Observer XT 15 (Noldus 2010). In these fragments, the duration of the meaningful moments varied from 6 to 50 s (in 'Fragment 1' 50 s, in 'Fragment 2' 6 s and in 'Fragment 3' 27 s). Each fragment was coded from the beginning to the end. Furthermore, to gain insight into the behavioural interplay that preceded the meaningful moment of interaction, the period 30 s before the beginning of the meaningful moment of interaction was also coded (i.e., its *onset*).

2.2 | Participants

The participants were three experienced staff members (female, age range: 30–59 years). As per the inclusion criteria, they worked with children with profound intellectual disabilities and had been working in their current care facility for at least 6 months and for at least 12 h a week. Each staff member participated together with a person with profound intellectual disabilities. In accordance with the inclusion criteria, they knew this person for at least 6 months, because they had been working with them for 5–11 years. All of the people with profound intellectual disabilities (two female, one male; 8–15 years) had a developmental age below 24 months and/or a pre- or proto-symbolic level of communication (for further information on the participants, see Penninga et al. 2024).

2.3 | Instruments

The selected fragments were coded microanalytically, using a coding scheme that was developed by Penninga et al. (2024) and which was based upon the coding scheme of Van keer et al. (2019). The developed coding system consisted of 19 behavioural categories: 12 simple behavioural categories ('look', 'facial expression', 'movement with head', 'movement with torso', 'movement with left arm', 'movement with right arm', 'touching with head', 'touching with torso', 'touching with left arm', 'touching with right arm', 'vocalisations' and 'sounds') and seven complex behavioural categories ('physical guidance/support with torso', 'physical guidance/support with right arm', 'physical guidance/support with left arm', 'gestures', 'active playing behaviour', 'mood' and 'tension') (for a more detailed description of the behavioural categories, see Penninga et al. 2024). For coding purposes, 0.04 s timeframes were used to score the presence of a behavioural category (e.g., 'looking', 'facial expression'). An extensive codebook specified the guidelines for coding and provided examples to specify and/or clarify. Inter-rater reliability was determined over the three fragments. With respect to the behavioural categories, for support staff, an average percentage of agreement of 93.9% was reached, whilst an average percentage of agreement of 88.2% was achieved for the behavioural categories of people with profound intellectual disabilities (Penninga et al. 2024).

2.4 | Analyses

To explore the behaviour of the support staff that preceded the behaviour exhibited by people with profound intellectual disabilities, sequences of these behaviours were investigated in the three dyads. This exploration focused on the coded behavioural categories that were found to be the most frequently displayed in the interactions between people with profound intellectual disabilities and their caregivers in Van keer et al. (2019) and/or Penninga et al.'s (2024) studies: looking, moving, vocalising and touching.

In the analysis, looking and vocalisation were included as singular variables, which meant that 'looking' was scored 'present' in case a person looked, and that 'vocalisation' was scored 'present' in case a person made any sound with their voice. Movement and touch were scored for different body parts in the present study, whilst in the analysis, the included subcategories (e.g., 'movement with left arm', 'movement with right arm') were partly combined. 'Movement with head' was included as a singular variable and was scored 'present' in the event of any movement of the head. 'Movement with arms' and 'touch' were included as clustered categories. 'Movement with arms' was scored as being 'present' whenever the left arm and/or right arm moved, whilst 'touch' was scored as being 'present' when one person touched the other with their head, torso, left arm and/or right arm in any way. In summary, the following five categories were included in the analyses: 'looking', 'movement with head', 'movement with arms', 'touch' and 'vocalisations'.

For each person, as a first step in the analysis, the presence of behaviour that came under the five behavioural categories was visualised within five horizontal bars (one behavioural category for each bar). To indicate whether behaviour took place during the onset or during the meaningful moment, a vertical black line was added to each bar to mark the starting point of the meaningful moment. Then, to compare each behavioural category of the person with profound intellectual disabilities with the behavioural categories of the staff member, for each dyad, five 'bar figures' were constructed. Within each 'bar figure', one behavioural category was visualised for the person with profound intellectual disabilities (e.g., 'vocalisation'), whilst all five behavioural categories for the staff member were visualised (see Figure 1). Subsequently, the point at which the behaviour by the person with profound intellectual disabilities began was marked (i.e., purple vertical line), as well as the moment when each behaviour stopped (i.e., orange vertical line).

In the second step of the analysis, for each beginning of behaviour by the person with profound intellectual disabilities (i.e., each purple vertical line), it was determined which specific behaviour the support staff initiated between a subsequent stop (i.e., orange line) and beginning of behaviour of a person with profound intellectual disabilities (i.e., purple line) ánd most approximate to the beginning of behaviour by the person with profound intellectual disabilities. To illustrate this step of the analysis, in Figure 2, the beginning of one of the three 'vocalisations' by the person with profound intellectual disabilities is shown in more detail. In the cutout, the lowest bar depicts the end of one vocalisation (i.e., orange vertical line) and the beginning of another one (i.e., purple vertical line). The most

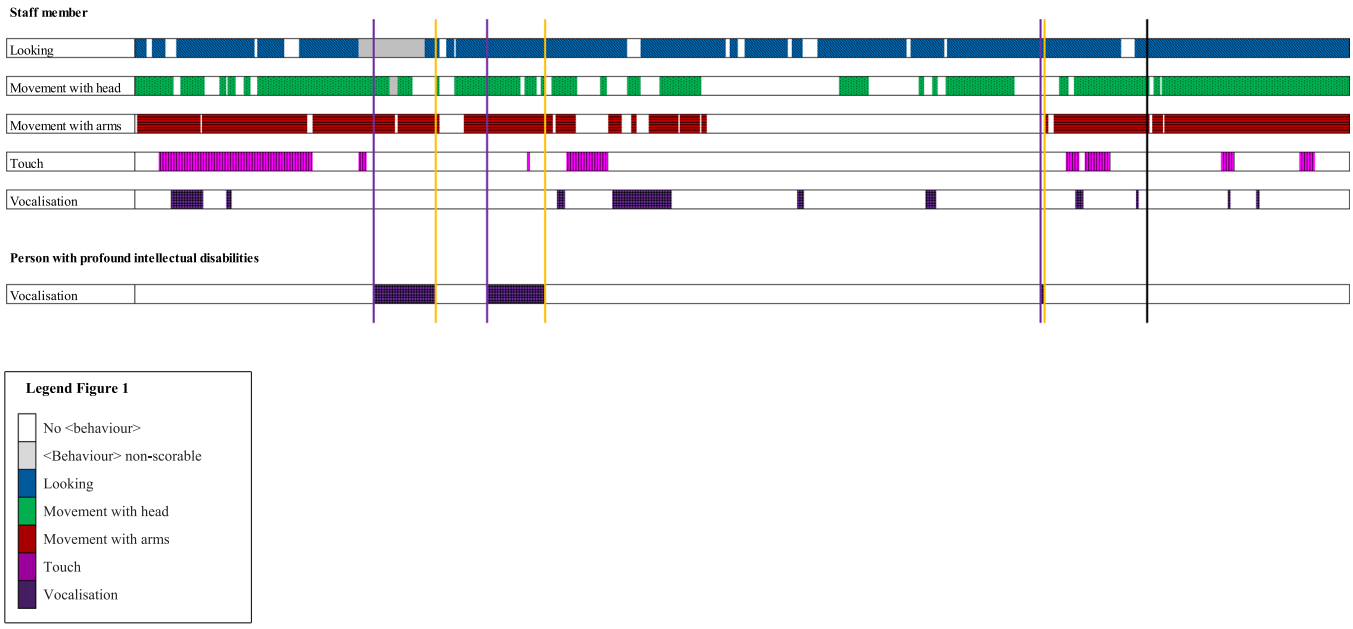

FIGURE 1 | Example of 'bar-figure'. [Color figure can be viewed at wileyonlinelibrary.com]

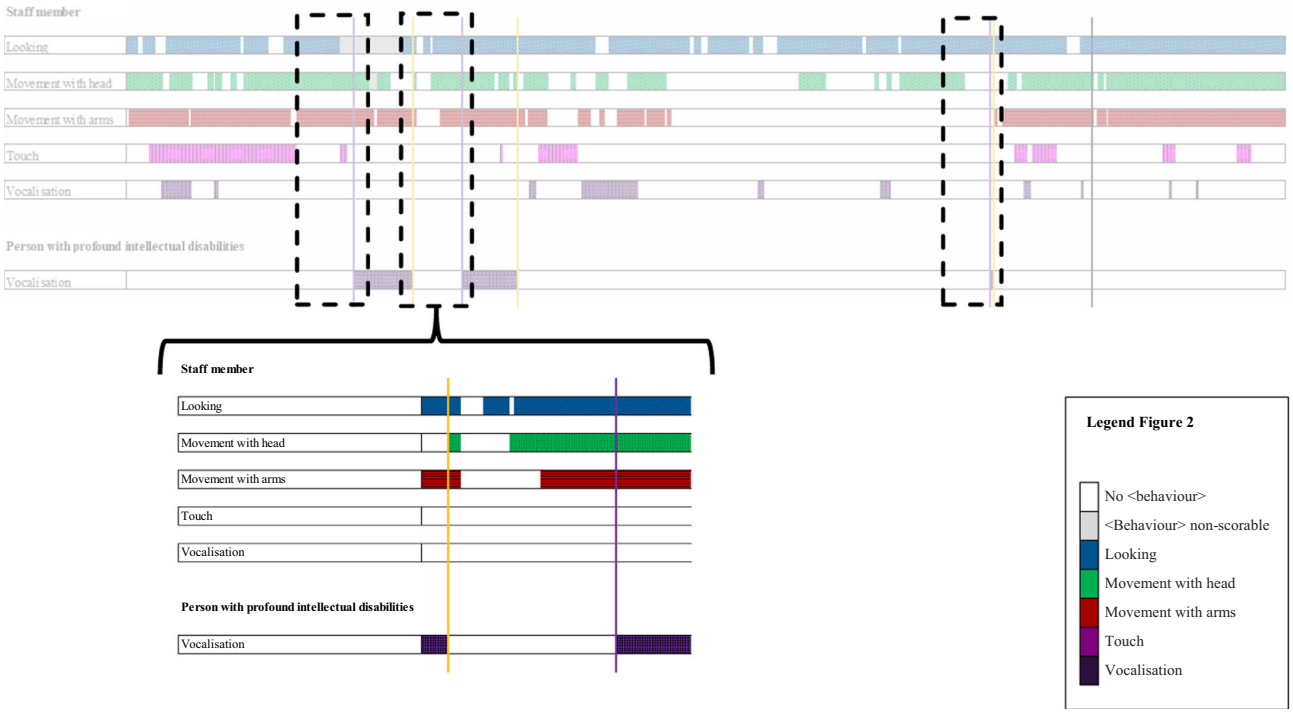

FIGURE 2 | Example of cutout 'bar-figure'. [Color figure can be viewed at wileyonlinelibrary.com]

approximate starting point of behaviour by support staff that preceded the beginning of the vocalisation of the person with profound intellectual disabilities was 'movement with arms' (i.e., the red bar).

In addition to this, it was also investigated whether any other type of behaviour by support staff began in between a subsequent stop and beginning of behaviour by the person with profound intellectual disabilities (i.e., the range between the orange and purple vertical line). The aim here was to focus on the behavioural sequence of the support staff that most approximately preceded the behaviour of the person with profound intellectual disabilities. Thus, in the example presented in the cutout in Figure 2, the following most-approximate behavioural sequence was noted: 'movement with head', 'looking' and 'movement with arms'. If the time between a subsequent stop and beginning of behaviour by the person with profound intellectual disabilities exceeded 5 s, then the behaviours of support staff that began in the 5 s period before the onset of behaviour by the person with profound intellectual disabilities were included in the noted preceding behavioural sequence. This is in line with Van keer et al.'s (2019) criterium for

exploring 'short-term temporal dependency'. Finally, given that the focus was on the initiation of behaviour by support staff, the behaviours of support staff that were continuously present between the beginning and previous stop of behaviour by the person with profound intellectual disabilities (i.e., the range between the orange and purple line) were not included.

3 | Results

To answer the research question 'What specific behaviours by support staff precede the initiation of behaviour by people with profound intellectual disabilities during (the onset of) meaningful moments of interaction?', three analyses were undertaken. First, as the initiation of behaviour by people with profound intellectual disabilities represented the starting point in the research question, the number of times they began to engage in a behaviour was determined. Second, to explore the behaviour of staff that preceded the onset of behaviour by people with profound intellectual disabilities, the most approximate starting points of behaviour by support staff were examined. Third, to deepen the previous examination, it was also determined how often these onsets of behaviour by support staff comprised more than one behaviour. The outcomes of the three analyses are described in turn below.

3.1 | Initiation of Behaviour by People With Profound Intellectual Disabilities

In the coded fragments, 250 instances of behaviour by people with profound intellectual disabilities were identified. As shown in Table 1, generally speaking, the starting points of this behaviour occurred equally often during the meaningful moments as they did during the onset of these moments (124 and 126 cases, respectively), albeit differences between dyads were found. In dyad 1, the initiation of behaviour occurred more frequently during the meaningful moment than during the onset (64 and 24 cases, respectively), whilst, in contrast, in dyads 2 and 3, they occurred more often during the onset than during the meaningful moment of interaction (dyad 2: 38 and 4 cases, and dyad 3: 64 and 56 cases).

3.2 | Most Approximate Starting Points of the Behaviour by Support Staff

Of the 250 instances of behaviour by people with profound intellectual disabilities, 109 were immediately preceded by an initiation of behaviour by support staff. As visualised in Table 2, this occurred less often during meaningful moments compared to during their onset (53 and 58 cases, respectively). However, differences were found with respect to the behaviour most approximately displayed by support staff. Support staff's 'touch' preceded the behaviour of people with profound intellectual disabilities in 17 cases during the onset, and, in contrast, in only two cases during the meaningful moment. Conversely, 'vocalisations' from support staff preceded the behaviour of people

TABLE 1 | Number of times people with profound intellectual disabilities initiated behaviour.

	Person with profound intellectual disabilities Dyad 1		Person with profound intellectual disabilities Dyad 2		Person with profound intellectual disabilities Dyad 3		Total	
	Onset	Meaningful moment	Onset	Meaningful moment	Onset	Meaningful moment	Onset	Meaningful moment
Looking	2	6	5	1	7	2	14	9
Movement with head	10	27	19	2	16	38	45	67
Movement with arms	10	20	9	1	28	3	47	24
Touch	0	6	2	0	3	0	5	6
Vocalisation	2	5	3	0	10	13	15	18
Total	24	64	38	4	64	56	126	124

TABLE 2 | Number of most approximate starting points of behaviour by support staff.

Behaviour initiated by people with profound intellectual disabilities	Most approximate starting points of behaviour by support staff									
	Looking		Movement with head		Movement with arms		Touch		Vocalisation	
	Onset	Meaningful moment	Onset	Meaningful moment	Onset	Meaningful moment	Onset	Meaningful moment	Onset	Meaningful moment
Looking	2	2	3	1	0	1	3	0	2	1
Movement with head	3	4	5	4	3	5	5	0	2	5
Movement with arms	3	1	3	2	4	3	2	1	3	3
Touch	0	2	2	2	0	1	1	0	0	0
Vocalisation	2	4	3	2	1	3	6	1	0	5
	10	13	16	11	8	13	17	2	7	14

with profound intellectual disabilities in 14 cases during the meaningful moment, and conversely, in only seven cases during the onset.

Next, the modes of behaviour within these behavioural sequences were explored. Table 3 visualises what behaviour support staff most approximately began before initiation of behaviour by people with profound intellectual disabilities.

The outcomes showed that a person with profound intellectual disabilities beginning to engage in 'looking' was equally preceded by 'looking' and 'movement with head' by support staff (27% of the cases), whilst it was preceded least often by 'movement with arms' (7% of the cases). A person with profound intellectual disabilities beginning to 'move with head' was most often preceded by 'movement with head' (25% of the cases) and least often preceded by 'touch' (14% of the cases). The initiation of 'movement with arms' by a person with profound intellectual disabilities was most often preceded by 'movement with arms' (28% of the cases), whilst, in contrast, it was least preceded by 'touch' (12% of the cases). A person with profound intellectual disabilities starting to 'touch' was most frequently preceded by 'movement with head' by support staff (50% of the cases), whilst it was never directly preceded by a 'vocalisation'. Finally, the initiation of a 'vocalisation' by a person with profound intellectual disabilities was most frequently preceded by 'touch' from support staff (26% of the cases) and least frequently by 'movement with arms' from staff (15% of the cases).

In addition, the information in Table 3 was also examined in an alternative way. Each time a staff member's behaviour preceded the beginning of behaviour by the person with profound intellectual disabilities, the behavioural categories that were displayed were determined. These percentages are presented in Table 4.

Table 4 showed that when focusing on each behavioural category separately, 'looking' (30%), 'movement with head' (33%), 'movement with arms' (38%) and 'vocalisation' (33%) by support staff were most often followed by 'movement with head' from the person with profound intellectual disabilities. When a person with profound intellectual disabilities started to 'vocalise' then this was most frequently preceded by a 'touch' (37%) from support staff.

3.3 | Preceding Successive Starts of Behaviours by Support Staff

Of the 109 cases in which behaviour by the person with profound intellectual disabilities was preceded by the initiation of behaviour by support staff, in 43 of these the aforementioned preceding behaviour by staff did not comprise one behaviour but rather included multiple, successive behaviours. As shown in Table 5, these successive behaviours occurred less frequently during the meaningful moments of interaction than they did during their onset (19 and 24 cases, respectively), although differences between the dyads were found. In dyad 1, the successive behaviours occurred more often during the meaningful moment compared to the onset (7 and 3 cases, respectively),

TABLE 3 | Most anapproximate starting points of behaviour by support staff.

Behaviour initiated by people with profound intellectual disabilities	Most approximate starting point of behaviour by support staff				
	Looking (%)	Movement with head (%)	Movement with arms (%)	Touch (%)	Vocalisation (%)
Looking	27	27	7	20	20
Movement with head	19	25	22	14	19
Movement with arms	16	20	28	12	24
Touch	25	50	13	13	0
Vocalisation	22	19	15	26	19

TABLE 4 | Most approximate predecessor of behaviour by people with profound intellectual disabilities.

Most approximate starting point of behaviour by support staff	Behaviour initiated by person with profound intellectual disabilities				
	Looking (%)	Movement with head (%)	Movement with arms (%)	Touch (%)	Vocalisation (%)
Looking	17	30	17	9	26
Movement with head	15	33	19	15	19
Movement with arms	5	38	33	5	19
Touch	16	26	16	5	37
Vocalisation	14	33	29	0	24

TABLE 5 | Frequency of successive behaviours by support staff that preceded the beginning of behaviour by people with profound intellectual disabilities.

Behaviour of person with profound intellectual disabilities	Number of preceding successive behaviours by support staff						
	Dyad 1		Dyad 2		Dyad 3		
	Onset	Meaningful moment	Onset	Meaningful moment	Onset	Meaningful moment	Total
Looking	0	1	3	0	2	1	7
Movement with head	0	1	3	0	3	4	11
Movement with arms	2	2	2	1	0	0	7
Touch	0	1	1	0	1	0	3
Vocalisation	1	2	1	0	5	6	15
Total	3	7	10	1	11	11	43

whilst, in contrast, in dyad 2, the successive behaviours primarily took place during the onset as opposed to the meaningful moment (10 and 1 case, respectively). In dyad 3, the successive behaviours occurred equally often during the onset and the meaningful moment (11 cases). In total, successive behaviours by support staff were most often followed by a 'vocalisation' (15 cases) or a 'movement with head' (11 cases) from people with profound intellectual disabilities, and least often (3 times) proceeded by a 'touch' from the person with profound intellectual disabilities.

Subsequently, the combinations of behaviours of support staff within a behavioural succession were explored. In Table 6, the frequency of two behaviours by support staff immediately following each other within a behavioural succession is reported. Generally speaking, the most frequently occurring combinations of successive behaviours were 'movement with arms' and 'movement with head' (18 cases in total), 'touch' and 'vocalisation' (15 cases in total) and 'movement with head' followed by 'looking' (10 cases), whilst 'movement with arms' never followed 'touch' and 'vocalisation' and 'touch' never followed 'movement with arms'. Sixty percent of the identified combinations were displayed by at least two of the three staff members, whilst 40% of the identified combinations were displayed by one staff member.

TABLE 6 | Combinations of behaviour within the successive behaviours by support staff.

Behaviour by support staff	Directly following behaviour by support staff																		Total number of cases				
	Dyad 1					Dyad 2					Dyad 3												
	Looking	Movement with head	Movement with arms	Touch	Vocalisation	Looking	Movement with head	Movement with arms	Touch	Vocalisation	Looking	Movement with head	Movement with arms	Touch	Vocalisation	Looking	Movement with head	Movement with arms	Touch	Vocalisation
Looking	0	2	1	1	0	1	1	2	0	0	0	0	1	0	6	1	3	4	1	6
Movement with head	2	0	6	0	0	3	2	2	0	1	4	0	0	2	3	9	2	8	2	4
Movement with arms	3	3	1	0	0	0	5	1	0	1	0	3	1	0	0	3	11	3	0	1
Touch	0	0	0	0	2	0	0	0	0	2	3	1	0	4	3	3	1	0	4	7
Vocalisation	1	1	0	0	0	2	3	0	0	0	2	2	0	8	1	5	6	0	8	1

4 | Conclusion and Discussion

In this exploratory study, the behaviour of support staff that immediately precedes the initiation of behaviour by people with profound intellectual disabilities was microanalytically examined. The behaviour that people with profound intellectual disabilities initiated the most were 'movement with head' or 'movement with arms', whilst they started 'touching' the least. In the three coded fragments of the three dyads, the most common behavioural combinations of staff's behaviour that preceded the initiations of behaviour by a person with profound intellectual disabilities were 'looking', 'moving with arms', 'moving with head' or 'vocalisations' which preceded 'moving with head', whilst 'moving with arms' preceded 'moving with arms' and 'touching' preceded 'vocalisation'.

Most initiations of behaviour by people with profound intellectual disabilities concerned movements, as well as the preceding (successive) behaviours by staff. This is in line with previous findings from Penninga et al. (2024) and Van keer et al. (2019), who indicated that movements are one of the most displayed behaviours in the interactions between people with profound intellectual disabilities and caregivers. The strong prevalence of movement in the studied interactions makes kinaesthetic attunement an interesting area to explore in future research. Previous parent–infant research suggests that the inclusion of kinaesthetic dimensions, such as 'directionality', 'tempo' and 'tension flow', provides deeper insights into the quality of the interactive interplay (Shai and Belsky 2011).

The combinations of behaviour by support staff and behaviour by people with profound intellectual disabilities that were identified in the study indicate that the most common response from the participating people with profound intellectual disabilities was to 'move the head'. However, in response to a 'touch' from support staff, 'vocalisation' appeared to be the most likely response from people with profound intellectual disabilities. It is important that this notable finding is put into perspective, however, as this combination of behaviours was only found in one of the three dyads, and hence, might have been affected by the specific characteristics of that dyad.

With respect to both the number and modes of behaviour employed by support staff and people with profound intellectual disabilities, differences between the dyads were also found. First, the varying duration of the coded meaningful moments may have affected the number of times a behaviour occurred and the number of behavioural sequences identified, insofar as a shorter duration would presumably provide less opportunities for initiations of behaviour to take place or sequences of behaviour to develop. However, the duration of the onset was equal for all the dyads, whilst the number of times in which behaviour was initiated varied. Therefore, the specific characteristics of the people involved should be taken into account. As suggested by Martin et al. (2022), the development of the interaction between support staff and people with profound intellectual disabilities is a process of reconciliation, and therefore, is affected by the abilities and uniqueness of both parties. Due to differences in the communicative abilities and personality of the people involved, the process of interactive attunement varies (Martin et al. 2022). As such, both the

number and types of behaviour initiated by people with profound intellectual disabilities as well as the behavioural input of the support staff may vary as well.

With respect to meaningful moments and their onset, generally speaking, there were no significant differences found in terms of the number of behaviours initiated by people with profound intellectual disabilities. In contrast, the behaviour of staff that preceded the initiation of behaviour by a person with profound intellectual disabilities occurred less often during the meaningful moment than during the onset. Moreover, differences were found with regards to the preceding behavioural modes of support staff during the meaningful moments compared to their onset. During the onset, 'touches' by staff preceded behaviour by people with profound intellectual disabilities more often than 'vocalisations'. In turn, during the meaningful moment, the 'vocalisations' of staff preceded behaviour by people with profound intellectual disabilities more frequently than 'touches' by staff. These differences might be explained through recourse to Martin et al. (2022) who point out that during dyadic interactions, various stages can be distinguished, such as 'establishing the connection' or 'maintaining the connection'. Therefore, perhaps the support staff used 'touch' predominantly to begin an interaction, whilst they used 'vocalisations' to keep an interaction going. To gain more insight into why support staff does or does not display specific behaviours during meaningful moments of interaction and their onset, in future research it would be valuable to discuss the (differences in) outcomes of sequential analyses with participating staff members. This would give more information on the motives of support staff for displaying or not displaying certain behaviours.

Within the successive behaviours of support staff, the combination of 'vocalisation' and 'touch' is notable, especially for the staff member in dyad 3 who most of the time touched the person with profound intellectual disabilities after they had vocalised. This behaviour is probably not without good reason. Indeed, infant research has shown that contingency in stimuli leads to quicker responses from infants (Haith, Hazan, and Goodman 1988). For example, the response time of three-and-a-half-month-old infants to visual stimuli that were offered in a regular pattern was lower and their level of anticipation was higher, in comparison to visual stimuli offered in an irregular pattern. In line with this, in the present study, the predictability provided by the recurring successive behaviours by support staff may make it easier for people with profound intellectual disabilities to respond and anticipate. Therefore, support staff contingently and consciously using their voice and touch successively may facilitate interactive interplay with people with profound intellectual disabilities.

In the present study, focusing on one piece of the puzzle of behavioural interplay during interactions (the most approximately occurring staff behaviours that preceded behaviour by people with profound intellectual disabilities) provided valuable insights into potentially stimulating behaviours by support staff. However, parent–infant research previously suggested that the interactive interplay is bidirectional in nature (Beebe, Jaffe, and Lachmann 2015): the behaviour of parents affects the behaviour of the infant, and, in turn, the behaviour of the infant affects the behaviour of the parent. In line with this suggestion, an exploration of the behaviour of the people with profound intellectual disabilities affecting the behaviour of support staff is a piece of the puzzle that is missing. A second missing piece of the puzzle is that responses may occur after a time lag, as noted in the study of Lima et al. (2013), who found that most of the behavioural responses from people with profound intellectual disabilities to a sensory stimulus occurred after a period of 5–10 s. Finally, a third missing piece of the puzzle is the nature of the behaviour that was displayed (e.g., the directionality of touch, the precise vocalisation). This might be relevant, as for example Hewett (2007) suggested with respect to touch, that it is not the behaviour 'as such', but the way that behaviour is displayed that matters. To unravel the interactive interplay further, future research should thus focus on these remaining pieces of the puzzle.

5 | Limitations

There are three limitations of the study that warrant mentioning here. First, in this study, three dyads were studied, each on a single occasion. Considering the variation in personality of both staff members and people with profound intellectual disabilities, as well as the variation in the nature of additional physical and/or sensory impairment(s) seen across the heterogeneous population of people with profound intellectual disabilities, the results of the present study show behavioural sequences in three interactive moments of three dyads. So, although the present study provides a first indication of behavioural sequences between people with profound intellectual disabilities and support staff, further research in a wider variety of dyads and situations is necessary to find out to what extent the sequences that were found in the present study are applicable for people with profound intellectual disabilities and support staff in general. Furthermore, the people with profound intellectual disabilities were all aged between 8 and 15 years. This might also have influenced the outcomes, as consciously or unconsciously attributed 'age-appropriate' forms of engagement may play a part in staff's preferred interactive behaviours (Nind and Hewett 2018), possibly most acutely when involving touch. Second, the reliability of the data was optimised by both determining inter-rater reliability and using extensive coding guidelines. However, the coder's accuracy in determining the exact moments at which behaviour began and stopped may still have had some impact upon the study's outcomes. Third, this study included changes in behaviour (i.e., 'initiations of behaviour') by people with profound intellectual disabilities and support staff within the analyses. Therefore, behaviours that were present and continuously ongoing but did not transpire within a certain time range were not taken into account, although these behaviours may have also affected the interactive interplay.

6 | Implications

Out of the 173 coded seconds, 250 instances of behaviour by people with profound intellectual disabilities were identified. In more than 50% of cases, these were not preceded by an observable display of behaviour by support staff. Therefore, they

may be considered as (potential) behavioural initiatives. The results of the detailed level of analysis of the present study demonstrated that many beginnings and stops followed each other within mere tenths of a second and thus could not be registered when the video was played at normal speed. Consequently, during a daily interaction these behavioural starts and stops would be incredibly hard to notice. As suggested in literature previously, the facilitation of communication and interaction with people with profound intellectual disabilities requires noticing their behaviours and 'reading' intention in them (Hewett and Nind 2013). In this light, the findings of the present study that confirm prior suggestions that certain initiatives by people with profound intellectual disabilities can easily be missed by support staff (Hostyn and Maes 2013) are truly relevant. Furthermore, the short duration of the behaviour exhibited by people with profound intellectual disabilities underscores previous findings regarding the subtlety of the behavioural changes amongst people with profound intellectual disabilities (Dhondt et al. 2021), and the necessity for support staff to observe attentively the behaviour of people with profound intellectual disabilities to discern these behavioural changes (Penninga et al. 2022). More specifically, support staff must be alert to movements of the head, movement of the arms and vocalisations from people with profound intellectual disabilities. Moreover, as certain behaviours by support staff appear to encourage certain responses from people with profound intellectual disabilities, support staff should actively use looking, movements of their head and arms, vocalisations and touch to trigger responses from people with profound intellectual disabilities, thereby facilitating the development of interaction. A research-informed 'social interactivity' training protocol, such as Intensive Interaction (Nind and Hewett 2012) could further support staff to reflectively develop ways that enable them to facilitate and encourage the social interactivity of the people with profound intellectual disabilities they care for.

7 | Conclusion

The results of the present study underscore that it is important for support staff to attentively observe behavioural initiatives from people with profound intellectual disabilities. Second, the findings highlight that support staff must be cognisant of their own behaviour, insofar as well-timed behaviour may encourage people with profound intellectual disabilities to respond.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The authors have nothing to report.

ENDNOTE

[1] For the sake of readability, we have opted to refer to 'people with profound intellectual disabilities and people with profound intellectual and multiple disabilities' as 'people with profound intellectual disabilities'.

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