Research has determined that individuals with aphasia (IWA) often present with deficits in divided attention (Murray, Holland, & Beeson, 1997a, 1997b; Murray, 1999; Murray, 2000). It is theorized in current literature that deficits in the overall capacity for attention and/or the ability to allocate and inhibit attention resources may contribute to the deficits observed (Murray, 1999; Shisler, 2005). When compared to the severe linguistic deficits in IWA, these subtle attention deficits are often overlooked. This can be problematic given the fact that the recovery process requires multiple domains of cognition—including attention (Helm-Estabrooks, 2002; Ramsberger, 2005).

In addition, the literature has reported that IWA may misjudge the amount of effort required to complete a demanding task. This inaccurate perception of task demand, or sense of effort (SOE), has been speculated as a possible source for decreased performance on tasks which require divided attention (Clark & Robin, 1995; Murray et al., 1997a). Subsequently, SOE has been used as a means for evaluating attentional performance.

Currently, there are limited available treatments to specifically address attention deficits in IWA (Helm-Estabrooks, 2002). Meditation has been indicated as a successful treatment for attention deficits in other health-related disorders for neurologically intact individuals (NI). For example, research has shown that individuals with ADHD benefit from meditation when it is applied as a complementary treatment to medication (Arnold, 1999). In particular, the extensively researched meditative technique of Mindfulness has been found to elicit benefits for attention for NI (Rutschman, 2004; Valentine & Sweet, 1999; Wenk-Sormaz, 2005). Therefore, mindfulness meditation (MM) may be a potentially promising treatment for IWA. In addition, MM has been cited in many studies as having positive outcomes for individuals suffering from affective disorders such as depression and anxiety (Grossman, Niemann, Schmidt, & Walach, 2004; Kabat-Zinn et al., 1992; Miller, Fletcher, & Kabat-Zinn, 1995). This is relevant to IWA, as research has shown that this population may suffer from depression, which can negatively affect the recovery process (Pachalska, Knapik, Smolak, & Pytel, 1987; Sarno, 1993). Because this type of meditation has been found to improve attention as well as affective disorders in NI, MM could be a possible complementary treatment for IWA. The following study aimed to evaluate MM as a potential complementary treatment for divided attention deficits in IWA.

Divided attention was evaluated in 3 IWA utilizing a dual, non-linguistic task similar to that of Erickson and colleagues' (1996) study. Performance on the task along with relaxation and SOE measures were evaluated as well. A multiple baseline single-subject design was used to show the effects of implementing MM as a treatment for IWA.

Method

A multiple baseline single-subject ABA design across individuals was used for this study. Three individuals between the ages of 45 and 59 with a history of left-hemisphere brain damage and aphasia were included in the study. All participants completed and passed a hearing screening prior to data collection.

Measures. Attention was measured via completion of a divided attention task which involved the simultaneous completion of identifying a target tone and sorting cards. Data were collected on the RT and accuracy on identifying the correct tone. While identifying tones, the participants simultaneously completed a second task of sorting cards. This task involved sorting cards from the Blink© game card deck either by shape, number, or color. Cards were continuously sorted for the duration of the presentation of tones over a 5 minute span.

Following the divided attention task, each participant completed a rating of his/her perceived SOE in order to determine the amount of effort expended during the task (Erickson et al., 1996; Murray et al., 1997a). In addition to the SOE scale, a Relaxation Inventory was administered every other session. Informal language measures were collected pre- and post-treatment in order to determine if MM resulted in any change in language. A connected speech sample was obtained with four stimuli: description of the "cookie theft" picture, a sequence of six pictures from the BDAE, CIUs were also obtained by asking the participant to answer one question about personal information and by describing one procedural event. Receptive language was assessed by using partial auditory comprehension subtests of the BDAE.

Phase B introduced the training of MM. The length of the training increased gradually beginning with 5 minutes of practice and building to 30 minutes. Treatment continued until no visual trends were evident for the accuracy of the tone identification task and card sorting task on at least three data points.

Movement to phase A2, or the maintenance phase, was determined by reaching 30 minutes of MM practice and stability for both accuracy on the tone identification task and card sorting task. Phase A2 then consisted of the completion of 5 sessions in order to determine if effects of treatment remained stable. During this phase, direct MM training ceased but data collection for performance on the divided attention task continued. Participants were instructed to continue practicing MM for at least 30 minutes each day on their own.

Results

All dependent variables were recorded and graphed each session. Movement between phases was dependent on relative stability of at least three data points for accuracy of the tone identification task, card sorting task, and total number of cards sorted. The following variables were recorded each session and graphed: percent accuracy for sorting cards, the number of target tones correctly identified, total number of cards sorted, RT for the identification of target tones, and SOE rating. A relaxation score was obtained every other session. Results showed no changes in performance on the divided attention task, in language, or in relaxation as a result of the implementation of MM. Measures of SOE revealed a relatively intact evaluation of task demand. All 3 participants exhibited high performance on the divided attention task with no obvious changes observed as a result of the implementation of MM (see Figures 1-3 and Table 1).

Discussion

The above findings suggest potential implications regarding attention and aphasia. First, the high performance on the divided attention task differed from Erickson et al. (1996), which could indicate that not all IWA have deficits in divided attention. Alternatively, the high performance observed may reveal that IWA have varying degrees of attentional impairment which may only surface when certain demands are presented. The attention task chosen may have led to the high performance for these participants. Another possibility for the lack of change in attention could be due to the abstract nature of MM. That is, IWA may require more direct and concrete forms of treatment to generate the benefits of attention that were seen in other populations. Furthermore, it is important to consider individual differences of time post onset of injury, type of resulting aphasia, and severity of insult. Any or all of these factors have the likely potential to influence outcomes of treatment and of course, attentional performance.

Additional research is needed to determine the effects of MM on attention in IWA. The lack of change observed in the present study yield inconclusive results. While the present study found no changes in task performance as a result of practicing MM, several aspects of the findings warrant further observation. Future studies should continue to address the source and nature of attentional impairment in IWA as well as potential treatments.

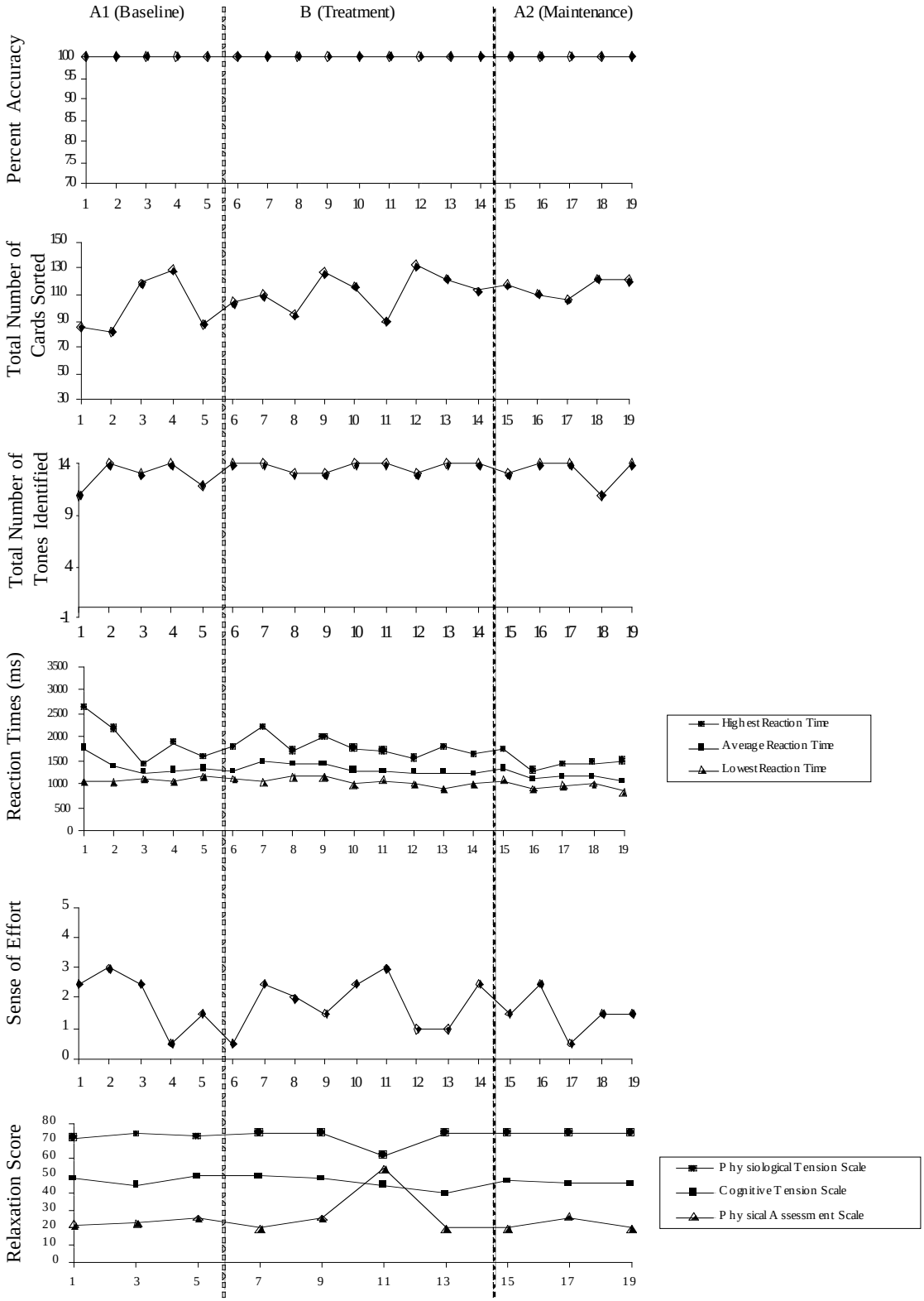

Figure 1. Performance on dependent variables for L.N.

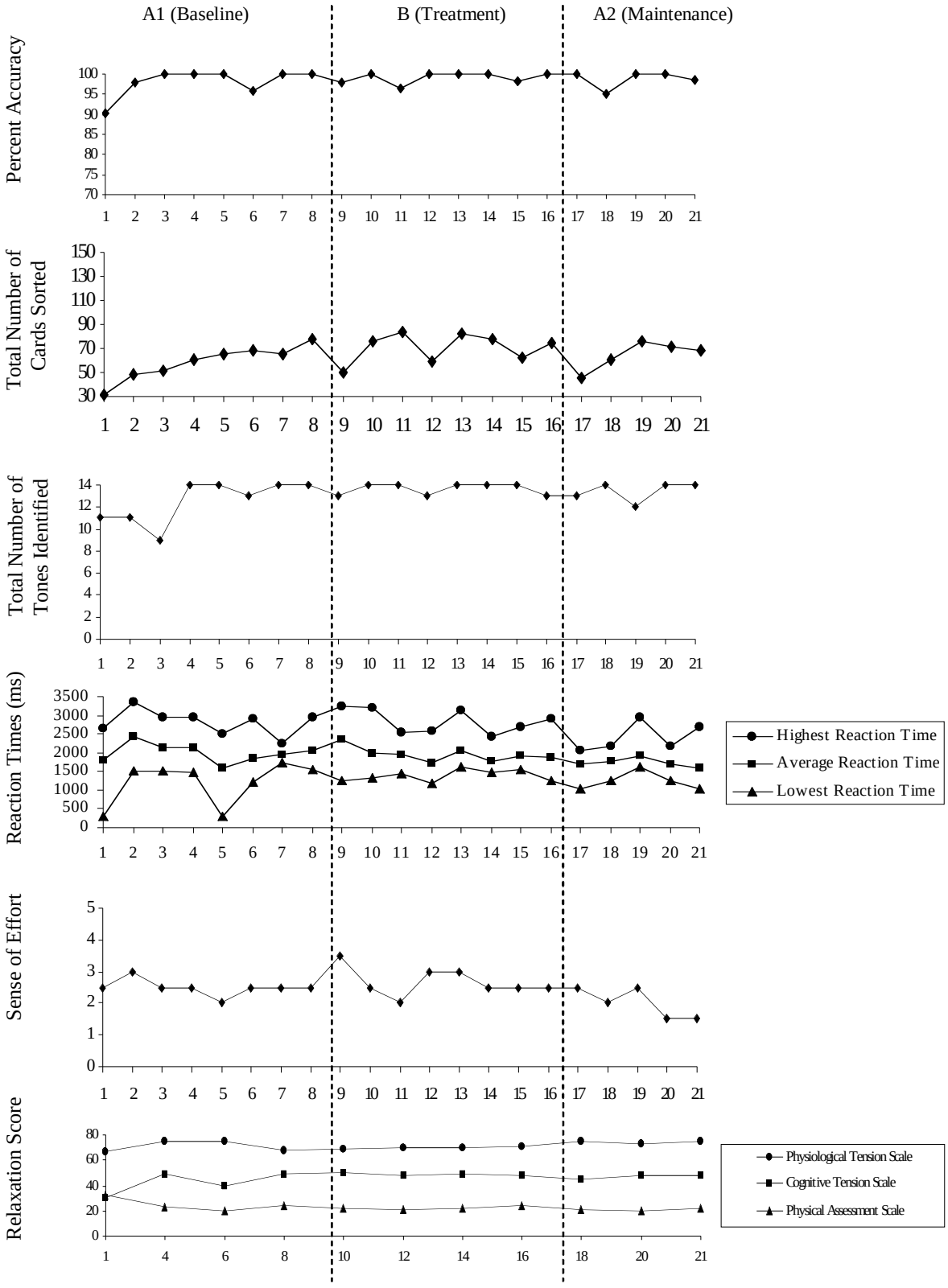

Figure 2. Performance on dependent variables for J.J.

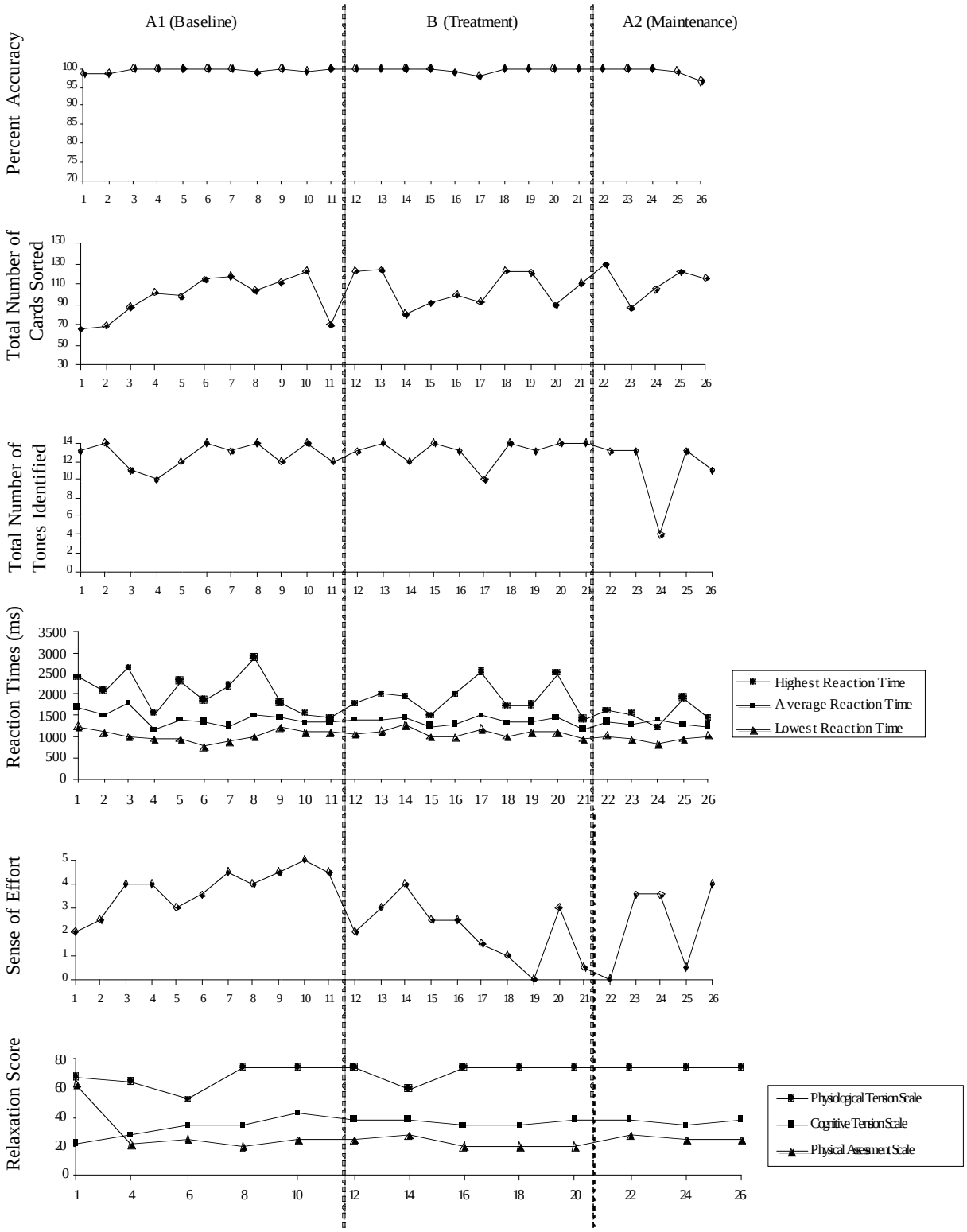

Figure 3. Performance on dependent variables for M.W.

Table 1

Pre- and Post-treatment Language Scores

	Pre-treatment				Post-treatment			
Participant	Receptive language score	WPM	%CIUs	CIUs/min.	Receptive language score	WPM	%CIUs	CIUs/min.
L.N.	84%	.91	65%	.64	74%	.97	59%	.62
J.J.	68%	.97	61%	.61	61%	1.65	65%	.89
M.W.	90%	1.28	86%	1.07	87%	1.17	84%	1.0

Note. WMP = words per minute; CIU = correct information unit.

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