

Clinical Relevance of New and Enlarging Lesion Volume in Relapsing Remitting Multiple Sclerosis: A Multi-Center Study

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We investigated the role of MRI biomarkers in monitoring Relapsing-Remitting MS (RRMS) disease activity and explored the relationship between new & enlarging lesion (NEL) volume and Expanded Disability Status Scale (EDSS) score.

Methods

At **group level**, the correlation between EDSS change & NEL volume is investigated using Pearson correlation coefficient. At **subject level**, the trend of EDSS score and NEL volume is examined over time.

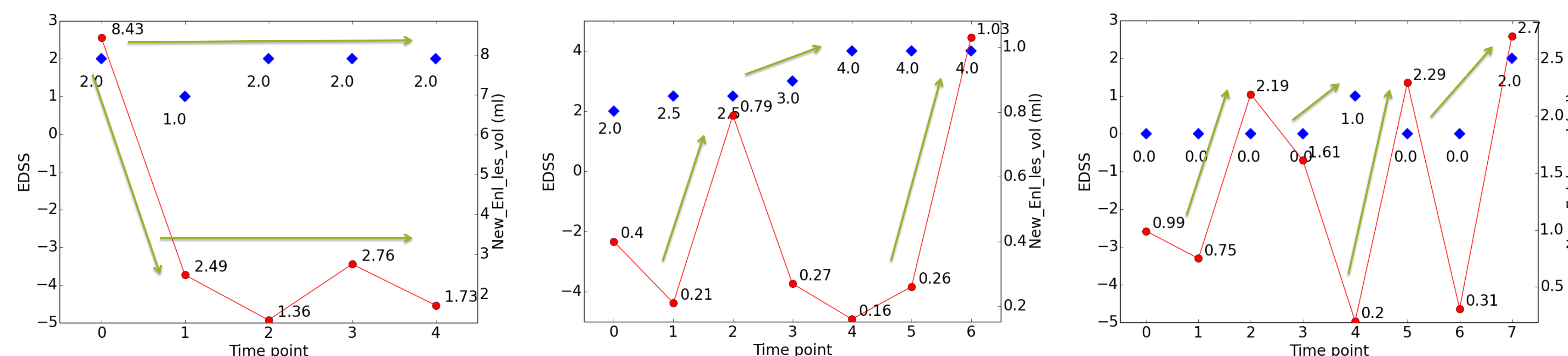
Dataset	# Patients	Scanner	Multi-center data
1	30	Siemens - 1.5 T	3 time points (6 or 12 months apart)
2	20	GE - 3 T	2 time points (12 months apart)
3	4	Philips - 3 T	2 time points (4 to 12 months apart)

Results

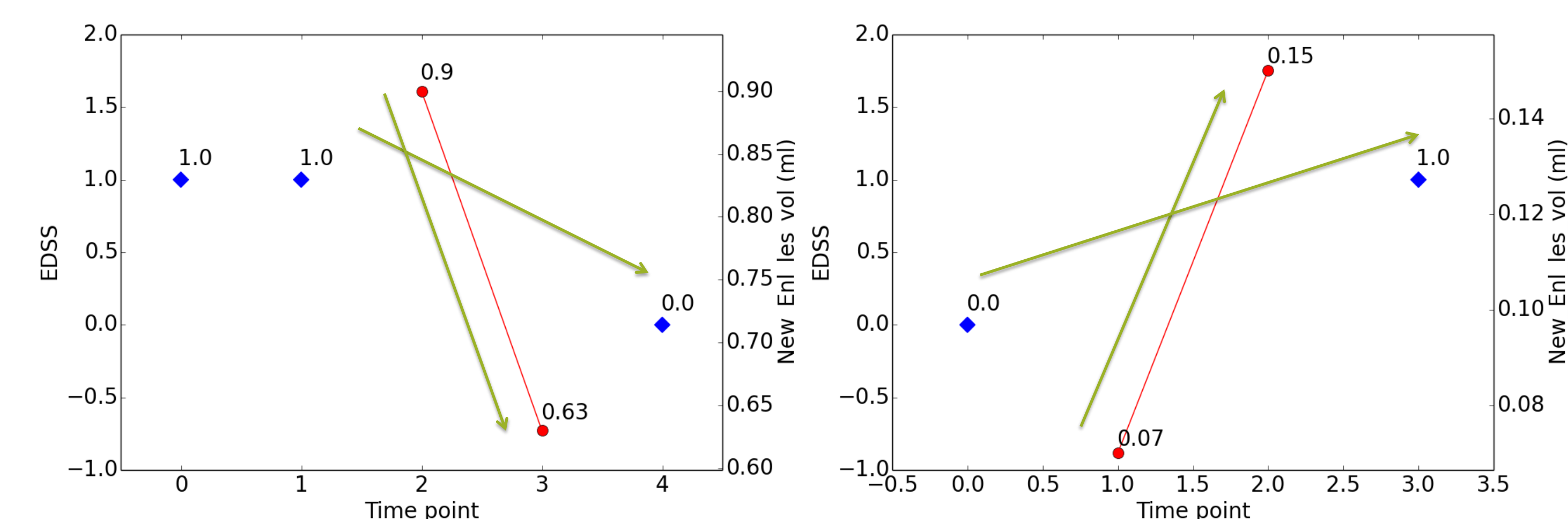
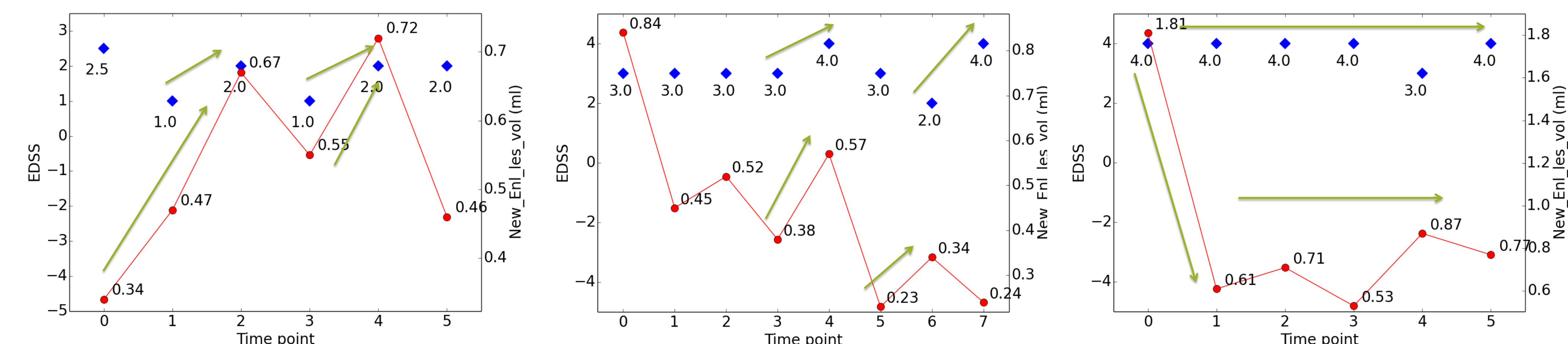
At a **group level**, the correlation between EDSS change and NEL volume is low (dataset 1 $r=0.09$, dataset 2 $r=0.12$, dataset 3 $r=0.14$, all datasets $r=0.17$).

At **subject level**, with an increase in the NEL volume, the EDSS score is increased either at the current time point or in the near future.

With a decrease in the NEL volume, the EDSS score is either reduced or stable. Examples from Dataset 1:

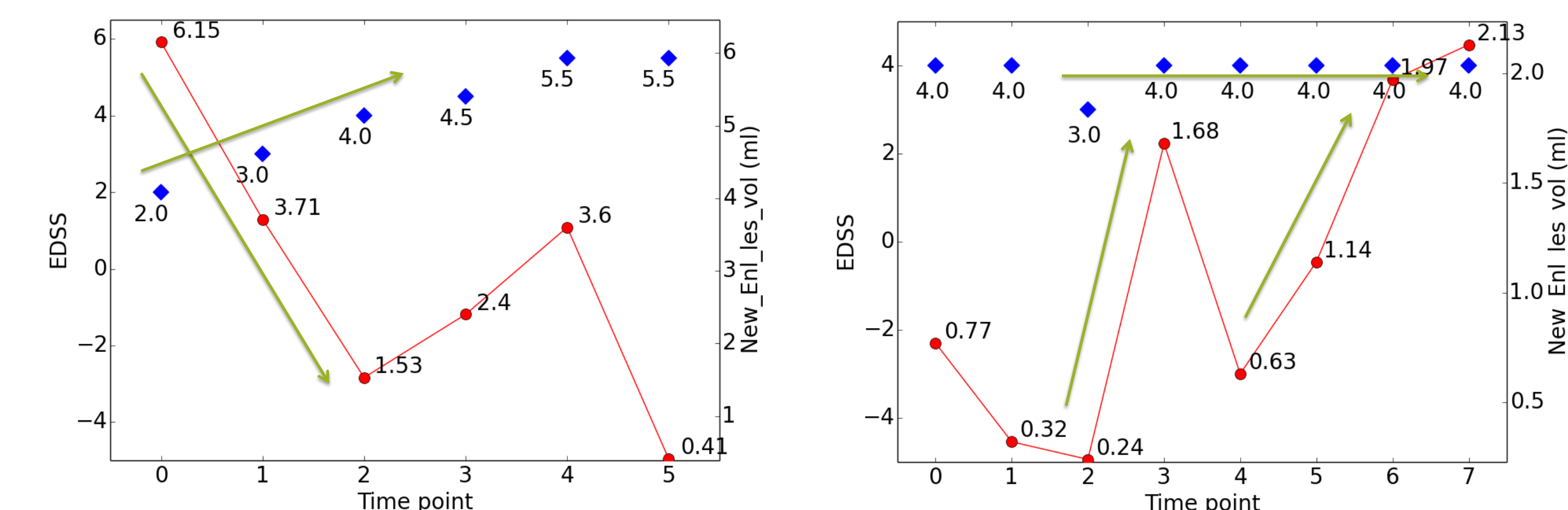


Higher lesion activity is reflected by an increased EDSS score. This trend can also be observed in dataset 2:



In dataset 3, the trend can be seen even though less time points are available.

In a few cases the trends are opposite and not immediately explainable. Examples from dataset 2:



The absence of a significant correlation at the group level is potentially caused by the low sensitivity of the EDSS score and it's susceptibility to inter-rate variability. However, trends in the data suggest that the New & Enlarging volume may predict how EDSS scores will evolve over time. New & Enlarging lesions should be investigated further and compared to more sensitive clinical scores to provide better insights in their prognostic value.