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Rejoinder on 'A selective overview of sparse sufficient dimension reduction'

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We thank all discussants for their insightful comments on 'A selective overview of sparse sufficient dimension reduction'. We agree that sparse sufficient dimension reduction (sparse SDR) as a model-free variable (feature) screening and/or selection approach, deserves an important role in many scientific studies. We hope that our comprehensive overview of the important developments in the field of sparse SDR, would stimulate further developments of new methods to cast new light on many intriguing problems.

It is also worthwhile to note that different perspectives may motivate further developments of sparse SDR. As suggested by Power and Dong, Bayesian methods can be adapted to sparse SDR. Reich et al. (2011), which focused on the sufficient dimension reduction approach via Bayesian mixture modelling, is a valuable reference for us to study sparse SDR via Bayesian methods. Power and Dong (2020) proposed a Bayesian model averaging approach to achieve sparse SDR. Zhang suggested that least-squares formulations and sparse/constrained canonical correlation might lead us to new methods in high-dimensional sparse SDR. The directions discussed by Power and Dong, and Zhang are inspiring and encouraging for current and future studies in dimension reduction.

Moreover, as Chen pointed out, there are also many unresolved issues and challenges in SDR. For one

thing, the inference studies after model selection are still scant. Chen also mentioned the hypothesis testing for structural dimension in high dimensional settings, which is another important issue. Last but not least, Zhu emphasised some important breakthroughs in sparse SDR and discussed the connections among those valuable sparse SDR methods, which helps shed a light on the intuition of those methods.

We thank again Chen, Power and Dong, Zhang and Zhu for their thought-provoking discussion on our article. We hope all our efforts can help attract more excellent researchers to study sparse SDR methods and apply those methods to the real world. We are also grateful to the editor, Dr Jun Shao, for organising the discussion.

Disclosure statement

No potential conflict of interest was reported by the authors.

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