Examples of introduction writing according to themes

Introduction tend to address a number of broad themes, all of which are aimed to be discussed in more detail in the rest of the essay. Such themes can include

- *Establishing the importance of a topic*

  "**The three most important** elements of statistics **are** measurement, comparison, and variation." The general language-structure of this type of sentence is shown below:

X is the most $\left\{\begin{array}{c}\text{important}\\ \text{fundamental}\\ \text{crucial}\\ \text{decisive}\\ \\ \ldots\end{array}\right\}$ $\left\{\begin{array}{c}\text{aspect}\\ \text{element}\\ \text{issue}\\ \\ \\ \ldots\end{array}\right\}$ of/in/about …

The {1, 2, 3…} $\left\{\begin{array}{c}\text{important}\\ \text{fundamental}\\ \text{crucial}\\ \text{decisive}\\ \\ \ldots\end{array}\right\}$ $\left\{\begin{array}{c}\text{aspects}\\ \text{elements}\\ \text{issues}\\ \\ \\ \ldots\end{array}\right\}$ of/in/about …

- *Establishing the importance of a topic for your discipline*

  "**The role of** mathematics [in big data analytics] **is easy to overlook** and **not fully recognized because** technological advances are much more visible than mathematical advances, even though the latter often have more effect. Here is a small illustration. It is common knowledge that the acceleration of computers caused by technological advances follows Moore's law: doubling of speed every 18 months. **However, it is much less known that** the acceleration caused by advances in mathematical methods in scientific computing and optimization **is at least** of the same order of magnitude, **and in some areas even much higher** (Bixby 2012, Schilders 2008)." (from chapter title: "Mathematics for Big Data", Alessandro Di Bucchianico et al., in *The best writing on mathematics*, Mircea Pitici (Editor), Princeton university press (2019))

The { role / performance / effect / influence / … } of X { is overlooked / is not recognised / tends to be ignored / is little known / … } with respect to …

- *Highlighting a problem or controversy*

  "[…] I think **the arguments given are often** rather dubious. *For example*, teachers often say that the mean is **'unduly' influenced** by outliers, but is this right? Surely outliers influence the mean to a precisely proportionate degree? **If** the outlier **is a mistake**, and we don't want it to influence our conclusions, we should remove it from our data. **If we** leave it in, because it is real, **then we should** expect and want it to have its due influence on our results. An outlier may be the most important piece of data." (from "Being mean about the mean", C. Foster, *Mathematics in School*, Vol. 43, No. 1 (JANUARY 2014), pp. 32-33)

The { argument that / claim for / assertion that / reason against / … } X is/are { obvious / dubious / supportive of / detrimental / benificial / … } do/do not …

X is/was /has been { considered / seen / discovered / found / identified / … } to be (a/an) { mistake / error / inaccurate / miscalculation / … } …

- *Highlighting gaps or inadequacies of previous research*

  The accurate communication of scientific discovery depends on transparent reporting of methods and results. Specifically, information on data variability and results of statistical analyses are required to make accurate inferences.

  The quality of statistical reporting and data presentation in scientific papers **is generally poor**. For example, one third of clinical trials in molecular drug interventions and breast cancer selectively report outcomes [1], 60-95% of biomedical research papers report statistical analyses that are not pre-specified or **are different to** published analysis plans [2], and one third of all graphs published in the prestigious Journal of the American Medical Association **cannot be interpreted** unambiguously [3]. In addition, **reported results may differ from the actual statistical results**. For example, distorted interpretation of statistically non-significant results (i.e. spin) is present in more than 40% of clinical trial reports [4].
  (from "Poor statistical reporting, inadequate data presentation and spin persist despite editorial advice", Joanna Diong, et al., *PLOS ONE*, August 15, 2018)

The { argument that / claim for / assertion that / reason against / … } X is/are { obvious / dubious / supportive of / detrimental / benificial / … }

Method X { has not been properly … / has been seen to give … / may differ from … / cannot be accurately … / … } { validated / misleading / determined / calculated / … }

- *Stating the purpose, aim or focus of the essay*

  "**This paper introduces** two coefficients **that compare** the mean and the median as statistics describe and/or summarize the central tendency of any set of data in such a way variation is minimized. **The relationship of** the size of these coefficients with the skewness kurtosis of the data **is studied**. *Population analogs* of these coefficients **are also introduced**." (from "Comparing the Mean and the Median as Measures of Centrality", Gordon R. Stavig and Jean D. Gibbons, *International Statistical Review*, 45 (1977) 63-70)

This paper /essay { argues / claims / asserts / challenges the view / questions the assumption / … } that X is/are …

The { relationship / connection / correlation / relevance / variability / … } { between / to / determined / amongst / … } X /X and Y is { identified / established / confirmed / demonstrated / … }

- *Significances and limitations of your work*

  "Median regression appears to be **a suitable alternative to** analyze the clustered and positively skewed LOS, **without transforming and trimming** the data arbitrarily." (from "Analyzing Hospital Length of Stay: Mean or Median Regression?", Andy H. Lee, Wing K. Fung and Bo Fu, *Medical Care*, Vol. 41, No. 5 (May, 2003), pp. 681-686)

  "The **important limitations of** statistics are:

  (1) Statistics laws are true on average. Statistics are aggregates of facts, so a single observation is not a statistic. Statistics deal with groups and aggregates only.

  (2) Statistical **methods are best applicable to** quantitative data.

  (3) Statistics **cannot be applied to** heterogeneous data.

  (4) If sufficient care is not exercised in collecting, analyzing and interpreting the data, statistical **results might be misleading**.

  (5) Only a person who has an expert knowledge of statistics can handle statistical data efficiently.

  (6) Some errors are possible in statistical decisions. In particular, inferential statistics involves certain errors. We do not know whether an error has been committed or not."

  (From https://www.emathzone.com/tutorials/basic-statistics/limitations-of-statistics.html)

The main { limitation / effects / constraints / drawback / flaw / … } of X is/are …

X is shown to be a suitable { alternative / replacement / substitute / … } for …

- *Outlining the structure or content of your essay*

  "We **conducted a cross-sectional analysis** of research papers published in the Journal of Physiology and the British Journal of Pharmacology to assess reporting practices. **Specifically, we assessed statistical reporting**, **data presentation and spin** in a random sample of papers published in the four years before and four years after the editorial advice by Drummond and Vowler was published." (from "Poor statistical reporting, inadequate data presentation and spin persist despite editorial advice", Joanna Diong, et al., *PLOS ONE*, August 15, 2018)