BACKGROUND: Federal research funding is decreasing, giving specialty organizations an increasingly important role in developing and fostering research.[1,2] As the research and innovation arm of the American Society of Plastic Surgeons, the Plastic Surgery Foundation (PSF) has a key role in supporting the most promising plastic surgery research. Understanding the grant review process as well as factors that contribute to receiving funding is paramount for aspiring academic surgeons.

METHODS: All research grant applications submitted to the PSF in 2012 and 2013 were evaluated. Each reviewer comment was independently assessed by two study team members and classified into key weakness categories. Chi-square test compared results between funded and non-funded grants. Linear regression identified which elements of grant critique corresponded to changes in scores, and logistic regression identified elements that predicted funding.

RESULTS: We analyzed 1,764 comments from 240 applications. Of these, 55 received funding. Funded grants had significantly fewer reviewer comments in 4 of 5 categories (Table 1). As expected, funded grants received better (lower) scores. Concerns in the categories of "plan for execution" and "other elements/granstmanship" significantly affected score as well as odds of funding (Table 2).

CONCLUSION: Ensuring that a grant addresses all required elements is important for receiving a low reviewer score. Our study demonstrates that "plan for execution" and "grantsmanship" influence reviewer scoring more than others. Therefore, investigators

must clearly address items associated with conducting the experiments and performing the analysis. Investigators must also give equal importance to elements of overall quality and completeness (writing quality, organization, ethical issues, etc.) to optimize chances of funding.

Table 1. Chi-square results of reviewer category concerns

Reviewer Category	Reviewer Comments in Funded Grants (%)	Reviewer Comments in Not Funded Grants (%)	Chi-square (p)
Project Concept	76.4	83.2	0.247
Project Design*	61.8	83.8	<0.001
Plan for Execution*	61.8	82.7	0.001
Team Environment*	25.5	40.0	0.05
Other Elements/Grantsmanship*	32.7	49.7	0.026

*significant with $p \leq 0.05$

Table 2. Logistic regression results of reviewer category deficiencies predicting funding

Deficiency Identified	**Effect on Grant Being Funded**		
	Odds Ratio	**Standard Error**	**P**
Project Concept	0.681	0.299	0.38
Project Design	0.606	0.290	0.30
Plan for Execution	0.409*	0.166	0.03
Team Environment	0.721	0.256	0.36
Other Elements/Grantsmanship	0.439*	0.149	0.02

*significant with $p \leq 0.05$

1. Dorsey ER, de Roulet J, Thompson JP, et al. Funding of US biomedical research, 2003-2008. *JAMA* 2010: 303: 137-43.
2. Chakma J, Sun GH, Steinberg JD, Sammut SM, Jagsi R. Asia's ascent--global trends in biomedical R&D expenditures. *N Engl J Med* 2014: 370: 3-6.