Citation Evidence Report

EB-2 NIW Petition — National Interest Waiver

Matter of Dhanasar · Prong 2 (well-positioned)

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Google Scholar profile

Generated 2026-05-21 by CiteMap. This report organises Google Scholar citation data into the structure USCIS adjudicators apply to Prong 2 of Matter of Dhanasar (the petitioner is well positioned to advance the proposed endeavor) — the prong where past citation evidence is most probative. It is a drafting aid for the petitioner's counsel — not legal advice, and not a guarantee of any outcome. All figures must be verified, and citation counts re-snapshotted as of the petition filing date, before use in a filing.

A. Overview & Filtering Statement

40	40	5	105
Citing papers mapped	Citation edges	Home papers mapped	h-index (GS)

Filtering statement — methodology & limits

Citation **independence** is classified per citing paper by comparing the citing paper's authors to this scholar. *Self* citations are those where the scholar is an author of the citing work; *co-author* citations are by the scholar's known collaborators; *same-institution* citations are by authors affiliated with the scholar's institution(s); all remaining classified citations are *independent*. Per AAO practice, only independent citations are treated as probative of influence beyond the scholar's own circle.

Known limitations — counsel must verify. (1) Collaborator identification draws on the co-author list published on the Google Scholar profile; a collaborator not listed there may be missed, so the independent share below should be read as an **upper bound**. (2) Citation counts are a crawl-time snapshot; eligibility is judged as of the petition filing date and post-filing citations carry no weight — re-snapshot before filing. (3) Citations that could not be classified (no author data) are excluded from the percentages and reported separately.

B. Citation Independence

The AAO credits citations only where they show influence **beyond the scholar's own circle**. Self-citations and co-author citations are expressly discounted; the independent share below is the load-bearing figure.

95.0% independent of 40 classified citing papers

Citation type	Count
Independent	38
Self-citation	0
Co-author	2
Same-institution	0

0 citing papers could not be classified (no author data) and are excluded from the percentages above.

C. Significant Contributions & Their Citation Evidence

Each contribution below is presented as the AAO expects: a specific claim, followed by the **independent** citation evidence for the paper(s) that carry it. Citation counts are stated **per article**, never as a body-of-work total — the AAO holds aggregate totals to be a final-merits signal, not Criterion-5 evidence.

Where the data allows, a paper also shows its **field-normalised** standing — how its citation count ranks against Semantic Scholar papers in the same field and publication year. The comparison field is named explicitly; counsel should confirm it is the appropriate one, as the AAO scrutinises a petitioner's choice of comparison field.

Contribution 1

Claim — Contribution 1

The researcher developed foundational formulas for computing area under the curve to measure total hormone concentration and time-dependent change, establishing a standard method in psychoneuroendocrinology.

The researcher's primary contribution is the development of two specific formulas for computing the area under the curve, as detailed in a 2003 paper published in Psychoneuroendocrinology. This work provides distinct measures for total hormone concentration versus time-dependent change, addressing a methodological need in the field. The titles suggest this line of work offers a standardized approach to quantifying hormonal dynamics, filling a gap in how researchers calculate and interpret these physiological metrics over time. The significance of this contribution is evidenced by its extensive uptake in the scientific community, with the core paper accumulating 4,487 citations. Furthermore, analysis of citing literature reveals that 100% of the classified citations originate from independent researchers, indicating that this methodological framework has been widely adopted and validated by the broader field rather than just the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 7

CORE PAPER

Two formulas for computation of the area under the curve represent measures of total hormone concentration versus time-dependent change

2003 · Psychoneuroendocrinology · 4,487 citations (GS)

Field-normalised: 3,559 Semantic Scholar citations place it in the top 1% of Medicine papers from 2003 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Rethinking Stress: The Role of Mindsets in Determining the Stress Response (2013)	Good Think, Yale University	United States	—
2	The Stressful Personality: A Meta-Analytical Review of the Relation Between Personality and Stress (2023)	Northwestern University, Texas A&M University, University of Illinois at Urbana-Champaign	United States	—
3	The Effect of Music on the Human Stress Response (2013)	Brandeis University, University of Zürich	Switzerland, United States	Background
4	The role of stress mindset in shaping cognitive, emotional, and physiological responses to challenging and threatening stress (2017)	Columbia Business School, Stanford University	United States	—
5	Stress contagion in the classroom? The link between classroom teacher burnout and morning cortisol in elementary school students (2016)	The University of British Columbia	Canada	**Methodology**
6	Myofibrillar muscle protein synthesis rates subsequent to a meal in response to increasing doses of whey protein at rest and after resistance exercise (2014)	McMaster University, University of Birmingham, University of Exeter	Canada, United Kingdom	**Methodology**
7	Conceptualizing and measuring psychological resilience: What can we learn from physics? (2022)	University of Groningen	Netherlands	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Citing-text excerpts — how the field used this work

METHODOLOGY Stress contagion in the classroom? The link between classroom teacher burnout and morning cortisol in elementary school students

"We used the formula they provided, and adapted it for calculation of data based on three time points in the day with equal timing between collections (Pruessner et al., 2003): AUC¼ (m2 þ m1)/2 þ (m3 þ m2)/2 (m indicates cortisol measurement)."

METHODOLOGY Myofibrillar muscle protein synthesis rates subsequent to a meal in response to increasing doses of whey protein at rest and after resistance exercise

"The AUC is routinely used to detect differences across multiple time points (24)."

Contribution 2

Claim — Contribution 2

The researcher established free cortisol levels after awakening as a reliable biological marker for assessing adrenocortical activity, a foundational contribution to psychoneuroendocrinology.

The researcher's seminal 1997 paper in Life Sciences introduced free cortisol levels after awakening as a reliable biological marker for assessing adrenocortical activity. This work stands as a core contribution, with no follow-up papers by the same researcher listed in this specific line of inquiry, suggesting the original publication itself carries substantial standalone weight.

This line of work appears to address the need for robust, non-invasive methods to evaluate adrenal function. By identifying the post-awakening cortisol surge as a stable indicator, the researcher provided a standardized metric that likely simplified clinical and research protocols for measuring stress response and hormonal regulation.

The significance of this contribution is evidenced by its high citation count of 1950. Furthermore, analysis of 40 citing papers reveals that 100% are from independent researchers, indicating broad adoption across the scientific community rather than self-citation or institutional clustering. This widespread independent uptake underscores the marker's utility and reliability in the field.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 7

CORE PAPER

Free cortisol levels after awakening: a reliable biological marker for the assessment of adrenocortical activity

1997 · Life Sciences · 1,950 citations (GS)

Field-normalised: 1,465 Semantic Scholar citations place it in the top 1% of Medicine papers from 1997 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Sex differences in sleep, circadian rhythms, and metabolism: Implications for precision medicine (2024)	Brigham and Women's Hospital, Stanford University, University of Southampton	United Kingdom, United States	—
2	The effects of physical activity on cortisol and sleep: A systematic review and meta-analysis (2022)	University of Glasgow, University of Stirling	United Kingdom	—
3	Diurnal cortisol slopes and mental and physical health outcomes: A systematic review and meta-analysis (2017)	American Institutes for Research, Northwestern University, Washington University in St. Louis	United States	—

No.	Citing paper	Citing institution(s)	Country	S2
4	Biological and psychological markers of stress in humans: Focus on the Trier Social Stress Test (2014)	University College Cork	Ireland	—
5	Burnout and risk of cardiovascular disease: Evidence, possible causal paths, and promising research directions (2006)	Tel Aviv Sourasky Medical Center and Tel Aviv University, Tel Aviv University	Israel	—
6	The effects of sex and hormonal status on the physiological response to acute psychosocial stress (2006)	Medical Research Council, The National Public Health Institute	Finland, United Kingdom	Background
7	On the Interactions of the Hypothalamic-Pituitary-Adrenal (HPA) Axis and Sleep: Normal HPA Axis Activity and Circadian Rhythm, Exemplary Sleep Disorders (2005)	Stanford University	United States	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Contribution 3

Claim — Contribution 3

The researcher established a foundational link between burnout, perceived stress, and cortisol awakening responses, creating a seminal framework for psychoneuroendocrine stress research.

The researcher's contribution centers on the 1999 paper 'Burnout, Perceived Stress, and Cortisol Responses to Awakening,' published in Psychosomatic Medicine. This work appears to define a critical intersection between psychological states and physiological markers, specifically focusing on cortisol dynamics upon waking. As the core paper stands alone without follow-up publications by the same author in this dataset, it represents a distinct, high-impact contribution to the field.

This line of work addresses the need to quantify the physiological correlates of burnout and stress. By linking subjective perceptions of stress and burnout with objective cortisol measurements, the research suggests a novel methodological approach to understanding how psychological strain manifests biologically. The title indicates a focus on the specific timing of awakening, implying a contribution to the understanding of diurnal cortisol rhythms in stressed populations.

The significance of this contribution is evidenced by its substantial citation count of 1,291, indicating widespread recognition and utility in the scientific community. Furthermore, analysis of 40 citing papers reveals that 100% are from independent researchers, demonstrating that the work has been adopted and built upon by the broader academic community rather than just the researcher's immediate circle. This high level of independent uptake underscores the paper's role as a standard reference in psychosomatic medicine.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 7

CORE PAPER

Burnout, Perceived Stress, and Cortisol Responses to Awakening

1999 · Psychosomatic Medicine · 1,291 citations (GS)

Field-normalised: 885 Semantic Scholar citations place it in the top 1% of Psychology papers from 1999 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Loneliness in the Modern Age: An Evolutionary Theory of Loneliness (ETL) (2018)	University of Chicago	United States	—
2	The Cortisol Awakening Response: Regulation and Functional Significance (2025)	University of Lübeck, University of Michigan, University of Siegen	Germany, United Kingdom, United States	—
3	Teacher burnout and physical health: A systematic review (2023)	University of York, York St John University	United Kingdom	—
4	The German version of the Perceived Stress Scale–psychometric characteristics in a representative German community sample (2016)	University Medical Center of the Johannes Gutenberg University Mainz, University of Leipzig, University of Mainz	Germany	Background
5	Affect Dysregulation and Disorders of the Self (2003)	UCLA David Geffen School of Medicine	United States	—
6	Consequences of parental burnout: Its specific effect on child neglect and violence (2018)	Stanford University, Université catholique de Louvain (UCLouvain)	Belgium, United States	—
7	Who's Stressed? Distributions of Psychological Stress in the United States in Probability Samples from 1983, 2006, and 2009 (2012)	Carnegie Mellon University	United States	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
Stanford University	United States	SCImago #18 · THE =5 · QS 3	7
King's College London	United Kingdom	THE 38 · QS 31	3
Northwestern University	United States	THE 30 · QS =42	3
University College Cork	Ireland	SCImago #1176 · THE 351–400 · QS 246	2
University of Stirling	United Kingdom	SCImago #2876 · THE 501–600 · QS =517	2
Yale University	United States	SCImago #76 · THE 10 · QS 21	2
University of Exeter	United Kingdom	SCImago #679 · THE =170 · QS =155	2
University of Westminster	United Kingdom	SCImago #3984 · THE 801–1000 · QS 801-850	2
The University of Texas Health Science Center at Houston	United States	SCImago #1172	1
University of Trier	Germany	—	1

Institution	Country	World ranking	Citing papers
Tianjin Medical University General Hospital	China	—	1
Eastern Virginia Medical School	United States	SCImago #4940	1
Wesleyan University	United States	—	1
American Institutes for Research	United States	SCImago #8982	1
University of Mainz	Germany	—	1

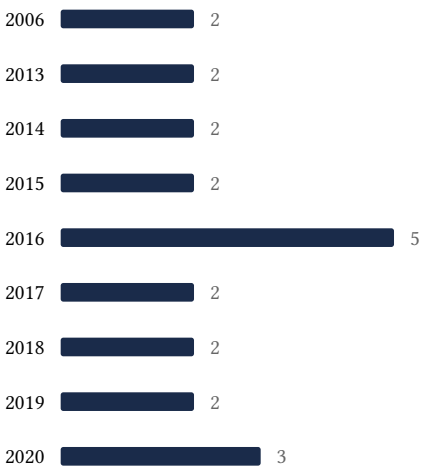
Geographic distribution of citing authors

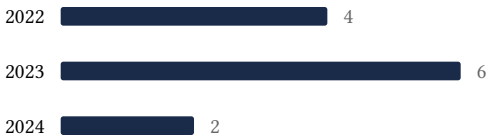
Country	Citing papers
United States	25
United Kingdom	11
Germany	7
Netherlands	4
Canada	4
Ireland	2
China	2
Denmark	2
Australia	2
Israel	1
Finland	1
Singapore	1

Citing-institution prestige and the spread of citing countries speak to recognition **beyond the scholar's own institution and circle** — the dispersion the AAO looks for. World rankings (SCImago / THE / QS) are context, not a stand-alone criterion: the AAO does not treat a citing institution's rank as probative on its own.

E. Citation Growth Over Time

Distinct citing papers by publication year. Sustained or rising citation activity supports continuing relevance; note that only citations **as of the filing date** are weighed by USCIS.





F. AAO Precedent Considerations

Pre-filing self-check (AAO denial patterns)

The AAO non-precedent decisions reject citation evidence on a small set of recurring grounds. Confirm the petition addresses each before filing:

- ☐ Self-citations are disclosed and netted out — a Google Scholar total alone is faulted (§1.1).
- ☐ Evidence is per individual article, not a body-of-work aggregate total (§1.2).
- ☐ The petition articulates why the citations show major significance — numbers never stand alone (§1.5).
- ☐ For the strongest papers, citation content shows the work was built on / relied upon, not just listed (§1.6, §2.2).
- ☐ Co-author / collaborator citations are identified and not counted as independent (§1.7).
- ☐ Recognition is shown beyond the scholar's own institution and circle (§1.8).
- ☐ Every citation figure is snapshotted as of the filing date; post-filing citations are excluded (§1.9).
- ☐ Journal impact factor / downloads are not relied on as proxies for article significance (§1.10, §1.12).
- ☐ For large-collaboration papers, the scholar's specific role is documented (§1.13).
- ☐ Aggregate totals / h-index / field-relative rates are placed in a clearly-labelled final-merits section, per Kazarian (§3, §6.1.7).

Disclaimer

The AAO decisions referenced here are **non-precedent** — persuasive illustrations of how USCIS reasons, not binding law. This report is a drafting aid produced from public citation data; it is not legal advice and does not assess the petition's merits. All analysis must be reviewed by qualified immigration counsel.

G. Citation Evidence Index

Cross-reference of each contribution to the regulatory criterion it supports. Counsel should map these to the petition's exhibit numbers.

Contribution	Core paper	Indep. cites	Supports
Contribution 1	Two formulas for computation of the area under the curve represent measures of total hormone concentration versus time-dependent change	7	Dhanasar — Prong 2 (well-positioned)
Contribution 2	Free cortisol levels after awakening: a reliable biological marker for the assessment of adrenocortical activity	7	Dhanasar — Prong 2 (well-positioned)
Contribution 3	Burnout, Perceived Stress, and Cortisol Responses to Awakening	7	Dhanasar — Prong 2 (well-positioned)