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EXHIBIT H

EXPERT REPORT, ANNA LEMBKE, M.D.

July 11, 2025

RELATING TO:

State of New Mexico, Ex Rel., Raul Torrez, Attorney General v. Meta Platforms, Inc.; Instagram, LLC; Meta Payments, Inc.; and Meta Platforms Technologies, LLC.

First Judicial District Court, Santa Fe County

No. D-101-CV-2023-02838

depressive symptoms ~2 years later (10–11th grade). We assessed ASMU effects on brain responsivity to positive social feedback across puberty and relationships between brain responsivity development, ASMU symptoms, and depressive symptoms while considering gender effects. Findings demonstrate decreasing responsivity, across puberty, in the ventral media prefrontal cortex, medial prefrontal cortex, posterior cingulate cortex, and right inferior frontal gyrus associated with higher ASMU symptoms over 2 years later.”⁴⁵

- g. The risk of addiction, including to social media, increases with easier access, a larger quantity, higher potency, more novelty, and an element of uncertainty (gamblification).
 - i. Access (How Easy): Decades of addiction research have shown that when an addictive substance or behavior is more readily available, more people use it and more people get addicted to it.⁴⁶ Not everyone who is exposed to an addictive substance or behavior will develop addiction, but a consistent subset of the population will. Some individuals, including youth, are more vulnerable than others. Defendants have made it easy for kids and teens to access their social media products with few or no guardrails, thereby increasing the risk of social media addiction in youth.
 - ii. Quantity (How Much): The more the brain is exposed to an addictive substance or behavior, the higher the risk of addiction to that substance or behavior. Defendants’ social media products are inherently designed to maximize quantity through design features like *endless scroll/infinite scroll* and *autoplay*, increasing the risk of addiction and other mental health harms. The inventor of infinite scroll, Aza Raskin, stated infinite scroll is one of the “behavioral design loops that create some totality of, you know, digital cocaine.”⁴⁷ A report from Amnesty International on young people ages 13-24 found “a staggering 74% of respondents report checking their social media accounts more than they would like to. Respondents bemoaned the ‘addictive’ lure of the constant stream of notifications and targeted recommendations, often feeling ‘overstimulated’ and ‘distracted.’”⁴⁸

⁴⁵ Flannery, J. S., Burnell, K., Kwon, S. J., Jorgensen, N. A., Prinstein, M. J., Lindquist, K. A., & Telzer, E. H. (2024). Developmental changes in brain function linked with addiction-like social media use two years later. *Social cognitive and affective neuroscience*, 19(1), nsae008. <https://doi.org/10.1093/scan/nsae008>, at p. 1.

⁴⁶ The North American opioid epidemic is a prime example of this phenomenon, and there are many others.

⁴⁷ Deposition of Aza Raskin, March 17, 2025, In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation (MDL 3047), at 71;17-75:-7.

⁴⁸ Amnesty International. (2023, February 13). “We are totally exposed”: Young people share concerns about social media’s impact on privacy and mental health in global survey. <https://www.amnesty.org/en/latest/news/2023/02/children-young-people-social-media-survey-2/>

- iii. Potency (How Strong): The more potent a drug or behavior, the more likely it is to be addictive.⁴⁹ Defendants' social media exploit the inherently rewarding human need for social reciprocity, social validation, and group affiliation through a rapid feedback loop of *posts*, *likes*, *shares*, and *comments*, enumerated at scale. The *algorithmic feed* optimizes for engagement, including time spent on the platform. Time spent, especially to the exclusion of other activities the individual could or should be doing, is one measure of the potency of social media. Just as people can develop tolerance to social media, they can also experience withdrawal, often in the form of *FOMO*, *fear of missing out*, another common reason young users give for staying on social media platforms longer than they want to.⁵⁰ FOMO is a dysphoric (negative) mental state consistent with negative reinforcement, i.e. engaging in a behavior to stop feeling bad, in contrast to positive reinforcement, i.e. engaging in a behavior to feel good.⁵¹ Addiction often begins with positive reinforcement but progresses over time to negative reinforcement as the brain needs more of the substance or behavior in more potent forms and larger quantities to get the same response.
- iv. Novelty (How New): The brain's reward pathway is highly sensitive to new information and experiences.⁵² Through features like *notifications*, Defendants' social media products alert the user to new posts, thereby promoting ongoing engagement or re-engagement with the product, even when the user has directed their attention elsewhere. Notifications function as Pavlovian cues (conditioned stimulus) that perpetuate the addiction cycle by creating the anticipation of reward (unconditioned stimulus) that drives the motivation to get the drug or engage in the behavior.⁵³ Conditioned cues release dopamine in the brain's reward pathway in anticipation of future reward, setting up the cycle of anticipation, withdrawal, and craving that leads to addiction.⁵⁴

⁴⁹ NIDA. 2020, July 6. Drug Misuse and Addiction. Retrieved from <https://nida.nih.gov/publications/drugs-brains-behavior-science-addiction/drug-misuse-addiction> on 2025, March 29

⁵⁰ Alutaybi A, Al-Thani D, McAlaney J, Ali R. Combating Fear of Missing Out (FoMO) on Social Media: The FoMO-R Method. *Int J Environ Res Public Health*. 2020 Aug 23;17(17):6128. doi: 10.3390/ijerph17176128. PMID: 32842553; PMCID: PMC7504117.

⁵¹ Wise RA, Koob GF. The development and maintenance of drug addiction. *Neuropsychopharmacology*. 2014 Jan;39(2):254-62. doi: 10.1038/npp.2013.261. Epub 2013 Oct 11. PMID: 24121188; PMCID: PMC3870778.

⁵² Costa, V. D., Tran, V. L., Turchi, J., & Averbeck, B. B. (2014). Dopamine modulates novelty seeking behavior during decision making. *Behavioral Neuroscience*, 128(5), 556–566. <https://doi.org/10.1037/a0037128>

⁵³ Robinson, M. J., Anselme, P., Fischer, A. M., & Berridge, K. C. (2014). Initial uncertainty in Pavlovian reward prediction persistently elevates incentive salience and extends sign-tracking to normally unattractive cues. *Behavioural brain research*, 266, 119–130. <https://doi.org/10.1016/j.bbr.2014.03.004>;

⁵⁴ Schultz, W., Dayan, P., & Montague, P. R. (1997). A neural substrate of prediction and reward. *Science (New York, N.Y.)*, 275(5306), 1593–1599. <https://doi.org/10.1126/science.275.5306.1593>;
See Haugen_00010114 at Haugen_00010127.

- v. Uncertainty (How Likely): Studies indicate that uncertain rewards are more reinforcing than certain rewards.⁵⁵ By definition, gambling relies on uncertain rewards.⁵⁶ Defendants' social media products create uncertain rewards through design features such as the *mystery of the algorithm*, *ephemeral content*, and unpredictable awards, thereby gamblifying social media and contributing to the increased risk of social media addiction.
- h. Children and adolescents are especially vulnerable to the addictive nature of social media because of their sensitivity to social cues and their preference for short term, risky rewards.
 - i. Adolescents are sensitive to social cues. From an evolutionary perspective this makes sense: Adolescence is the time to search for and find reproductive partners. In experimental paradigms, adolescents show heightened responses to positive and negative social feedback.⁵⁷ After experiencing negative social feedback, teens report a greater drop in mood and more anxiety than adults.⁵⁸
 - ii. Social evaluation situations in adolescents cause a greater stress response (heightened response in the autonomic nervous systems as indexed by skin conductance) than in adults, and more feelings of self-consciousness.⁵⁹ While ostensibly being viewed by a peer in a live video feed, adolescents self-reported rapidly rising embarrassment which was correlated with distinct changes in brain imaging in key structures for integrating emotional and social information.⁶⁰ This response "drastically" increased during adolescence and subsided into adulthood.⁶¹
 - iii. At the same time that teenagers have a fine-tuned sensitivity for social cues, the prefrontal cortex, essential for regulating and tempering appetites and impulses, is still not fully connected to the subcortical

⁵⁵ Shen, L., Fishbach, A., & Hsee, C. K. (2015). The motivating-uncertainty effect: Uncertainty increases resource investment in the process of reward pursuit. *Journal of Consumer Research*, 41(5), 1301–1315. <https://doi.org/10.1086/679418>

⁵⁶ Linnet, J., Thomsen, K. R., Møller, A., & Callesen, M. B. (2010). Event frequency, excitement and desire to gamble, among pathological gamblers. *International Gambling Studies*, 10(2), 177–188. <https://doi.org/10.1080/14459795.2010.502181>

⁵⁷ Somerville, L. H. (2013). The Teenage Brain: Sensitivity to Social Evaluation. *Current Directions in Psychological Science*, 22(2), 121–127. <https://doi.org/10.1177/0963721413476512>

⁵⁸ Somerville, L. H. (2013). The Teenage Brain: Sensitivity to Social Evaluation. *Current Directions in Psychological Science*, 22(2), 121–127. <https://doi.org/10.1177/0963721413476512>

⁵⁹ Somerville, L. H. (2013). The Teenage Brain: Sensitivity to Social Evaluation. *Current Directions in Psychological Science*, 22(2), 121–127. <https://doi.org/10.1177/0963721413476512>, at p. 124.

⁶⁰ Somerville, L. H. (2013). The Teenage Brain: Sensitivity to Social Evaluation. *Current Directions in Psychological Science*, 22(2), 121–127. <https://doi.org/10.1177/0963721413476512>, at p. 124.

⁶¹ Somerville, L. H. (2013). The Teenage Brain: Sensitivity to Social Evaluation. *Current Directions in Psychological Science*, 22(2), 121–127. <https://doi.org/10.1177/0963721413476512>, at p. 124.